VOLUME 1 | APRIL 2022

THE WINGS

SCIENTIFIC NEWSLETTER

"FREEDOM FROM FEAR OF CANCER"

For Private Circulation Only
Published by : Clinical Research Secretariate, National Cancer Institute, Nagpur
Phone : 0712 2800400 **Email:** se.qt@ncinagpur.in

National Cancer Institute™

The Only Comprehensive Cancer Care Centre in Central India World-Class Treatment at Affordable Cost

Available Medical Facilities :

| Medical, Surgical & Radiation Oncology

| Chemotherapy | Critical Care
| Nuclear Medicine & PET Scan SPECT CT Gamma Camera
| Pathology Laboratory, IHC, Molecular lab
| Dedicated Pediatric Oncology Department
| Personalised Patient care

Khasara No. 25, Outer Hingna Ring Road,
Mouza - Jamtha, Nagpur - 441108, Maharashtra (India)

Website : www.ncinagpur.in
Email : info@ncinagpur.in
Switch Board : 0712-2800400 (100 Lines)
Emergency & Helpline : 1800-233-0033 (Toll Free)

VOLUME 1 | APRIL 2022

THE WINGS

SCIENTIFIC NEWSLETTER

Clinical Research Secretariat
National Cancer Institute, Nagpur

CONTENTS

VOLUME 1 | APRIL 2022

THE WINGS

SCIENTIFIC NEWSLETTER

For Private Circulation Only
Published By Clinical Research Secretariate,
National Cancer institute, Nagpur

DESIGN : VIVEK RANADE

PRINTING : VIPUL OFFSET

VOLUME 1 | APRIL 2022

THE WINGS

SCIENTIFIC NEWSLETTER

EDITORIAL

WORDS FROM DESK OF EDITORIAL MEMBERS

Greetings...from the editorial desk! It is a pleasure and honor for us to bring our very own, first newsletter of NCI. Over the past five years, since its establishment, NCI has offered a plethora of knowledge, experience and excellence in managing grotesque disease like Cancer NCI is a firmly established apex cancer institute of Central India & getting due recognition at National & International platforms.

Oncology has seen amalgamation of various multidisciplinary branches and is bringing to light various hidden aspects of the disease which can be tackled better through interdisciplinary interactions. Hence the importance of peeping into other disciplines, widening the horizons of our knowledge and incorporating the best principles into practise...one of the most preferred gateway being a Newsletter!!!!

When our respected Medical director put forward his vision of publishing our own Newsletter, a shimmer of scepticism ushered in our minds, as newly formed Editorial board members regarding topics as well as response. All our Clinicians, Technicians, Nurses, paramedical staff are toiling day and night for our patients, hence it was a pleasant surprise for us to receive so many wonderful academic as well as practical topics within no time. It was overwhelming and in fact we couldn't accommodate all the topics. Those who have missed this opportunity to portray their knowledge and research, there is a chance.....that too soon. We are happy to announce that this newsletter would be released bi annually & any topic related to cancer would be welcome.

Let us all gear up and keep ourselves abreast with this dynamic branch .....Oncology !!

Happy reading

MEDICAL DIRECTORS MESSAGE

NCI has got talent !!

Welcome to the first in house Scientific Newsletter of NCI!

I thank and congratulate the young and dynamic editorial board to bring out this inaugural scientific newsletter. This newsletter contains a spectrum of scientific contents including case reports, original research, write ups, perspectives, journal coverage, news of activities and achievements. The contents are indicative of quality patient care, scientific work and educational activities at NCI and also symbolise the pillars of a comprehensive cancer center that we are.

The editorial board plans to bring out two issues of this newsletter per year. I sincerely appeal to all my colleagues to actively contribute and publish your good work. This will also serve as an exercise in scientific writing.

I take this opportunity to thank *Shri Devendraji Fadnavis,* Ex Chief Minister, Maharashtra and Leader of Opposition for his continuous patronage and guidance. I would to like to specially thank the members of Governing Board NCI for their guidance and support.

Dr Anand Pathak, MD

01 DIAGNOSTIC DILEMMA

"OSTEITIS FIBROSA CYSTICA" MIMICKING MULTIPLE MYELOMA

DR. ASHISH BOHRA, Consultant Pathology, Department of Pathology

ABSTRACT

Lytic skeletal lesions need to be investigated as they raise a suspicion of primary bone tumor or metastatic deposits from some other primary. Also an extremely common infective etiology like tuberculosis needs to be ruled out in India. In adults multiple bony lytic lesions raise the suspicion of multiple myeloma, metastasis from a primary cancer or tuberculosis. Rarely parathyroid lesions can also manifest as extensive bony lytic lesions.

"Osteitis fibrosa cystica" (OFC) is a late complication of primary and secondary hyperparathyroidism. In recent times OFC is a rare entity because of easily available biochemical and radiological investigations as they help in early diagnosis of OFC.

Most common findings associated with primary hyperparathyroidism (PHPT) are raised serum calcium, alkaline phosphatase and parathormone levels. However, a normocalcemic variant of PHPT has also been reported in the literature. Here we shall discuss a rare case of osteitis fibrosa cystica mimicking multiple myeloma with near normal calcium levels.

Here we present a case of Osteitis fibrosa cystica (OFC) which is a rare presentation of primary hyperparathyroidism with marginally raised serum calcium levels and markedly raised parathyroid hormone.

Keywords: Lytic skeletal lesions, Osteitis fibrosa cystic, Hyperparathyroidism.

CASE REPORT

A 64 year female presented with complaint of weakness in bilateral lower limbs since 2 months. She also had long standing history of back pain for the past 7 years, but the pain had intensified in the last 2 years.

In view of back pain MRI lumber spine was carried out which showed diffuse T1 hypointense mottled appearance of vertebrae and iliac bones along with diffuse thickening with hypointense signals.

A provisional diagnosis of multiple myeloma was given by the radiologists and the patient underwent myeloma workup . Blood investigations showed hemoglobin of 12 gm/dl, total leukocyte count of 7800/cumm and platelet count of 2.21 lacs /cumm.

Biochemical investigations showed markedly elevated serum alkaline phosphatase (Sr. ALP) levels 1970 U/l, near normal or marginally elevated serum calcium levels (Sr. Ca) 10.8mg/dl and serum creatinine levels (Sr.Creat) of 0.95mg/dl. Rest of the biochemical parameters were within normal limit.

Serum protein electrophoresis did not reveal any "M band". Serum free light chain assessment revealed normal kappa/lambda (FLC) ratio of 1.533.

Bone marrow examination reported outside showed only 5% plasma cells and a hypocellular marrow.

PET-CT was carried out at our institute which showed metabolically active lytic-sclerotic as well as infiltrative marrow lesions, involving axial, appendicular skeleton and calvarium. Metabolically active hypodense nodule was seen involving the right lobe of thyroid gland. A USG and cytological correlation was recommended for the same.

Patient underwent USG neck and repeat bone marrow examination .

USG neck showed two well defined lesions along the inferior poles of thyroid gland on either side suggestive of parathyroid adenoma . Bilateral thyroid nodules were also seen which were reported as TIRAD 3.

FNAC was performed from thyroid nodule which showed features of Nodular goiter, Bethesda category II. Parathyroid cells were not documented in the aspirate.

In view of parathyroid adenomas on USG, serum parathormone level was sent which was markedly elevated with values of 1717 pg/ml (Normal range 15-68.3 pg/ml).

Bone marrow examination was performed from Right posterior superior iliac spine. Aspiration was easy.

Bone marrow aspiration showed all preserved cell lines however they were markedly suppressed. Plenty of osteoclastic giant cells were also seen. In view of morphological and radiological features the impression was given as hypoplastic marrow with marrow changes associated with parathyroid neoplasm.

Bone marrow biopsy showed adequate decalcification of the tissue which were 0.3- 0. 7 cm in length. All cell lines including myeloid , erythroid and megakaryocytic were suppressed and were replaced by fibrous tissue with prominent blood vessels. At places howship lacunae were also seen. There was no evidence of metastases. Final diagnosis signed out was "osteitis fibrosa cystica" in known case of hyperparathyroidism with parathyroid neoplasm.

Later patient underwent bilateral inferior parathyroidectomy. Immediate post operative parathormone dropped to 32 pg/ ml. On follow up patient is doing well clinically.

REVIEW OF LITERATURE

The term "Osteitis fibrosa cystica" was first coined by Von Recklinghausen in 1981. [1] It is a rare presentation of hyperparathyroidism in the recent times.

OFC is a terminal or advanced skeletal manifestation of parathyroid neoplasms. Primary hyperparathyroidism is characterized by excessive secretion of parathyroid hormone, most commonly due to parathyroid adenomas (80-85%) or parathyroid carcinoma or hereditary factors in the rest of the cases. [2]

OFC is characterized by fractures, deformities, bone cyst and brown tumours.[3] Nowadays, because of advances in diagnostic modalities, hyperparathyroidism whether primary or secondary is diagnosed much early in the course of disease; because of which the frequency OFC or other advanced manifestation of hyperparathyroidism have been reduced significantly.

On radiology, OFC is defined as subperiosteal bone resorption, osteolysis of distal clavicles, salt and pepper appearance of the skull bones, bone cyst and evidence of brown tumor. Few cases might present with large osteolytic lesions, leading to suspicion of primary or metastatic cancers.

Serum parathormone (PTH), serum calcium and serum alkaline phosphatase levels are usually raised in primary hyperparathyroidism. PTH levels also help to differentiate between primary and secondary hyperparathyroidism. In the recent era hypercalcemia is one of the most important and classical biochemical indicators for early diagnosis of Primary Hyperparathyroidism. Raised serum calcium level is the hallmark for diagnosis. A Normoclacemic variant of primary hyperparathyroidism has also been described in the literature.[4]

The treatment management includes surgical resection of the parathyroid adenomas along with hydration, particularly in cases of PHPT. Management varies according to the severity of the symptoms.

REFERENCES

- Von Recklinghausen FD. Die fibrose oder deformierende osteitis, die osteomalazie und die osteoplastische carcinose in ihren gegenseitigen beziehungen. Osteitis fibrosa or deformans, osteomalacia and osteoplastic carcinosis in their relationships. Fortschr Virchow 1891;1-45.
- Kearns AE, Thompson GB (2002) Medical and surgical management of hyperparathyroidism. Mayo Clin Proc 77(1):87–91.
- Raeburn CD, Cothren C, McIntyre RC jr. End-stage skeletal manifestation of severe hyperparathyroidism. Surgery 2002 Nov;132(5):896-898.
- Bilezikian JP, Silverberg SJ. Normocalcemic primary hyperparathyroidism. Arq Bras Endocrinol Metabol. 2010 Mar;54(2):106-9.

HIGH INDEX OF SUSPICION NECESSARY IN SUCH CASES

Dr. Meena Pangarkar, Head, Laboratory Sciences, NCI

IMAGES

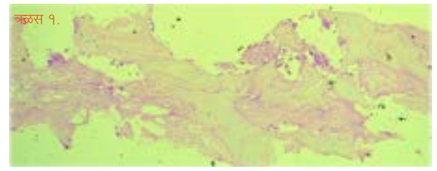


Fig 1. H&E staining 4x magnification: Bone marrow biopsy. Showing marked fibrosis and suppressed normal hematopoietic elements.

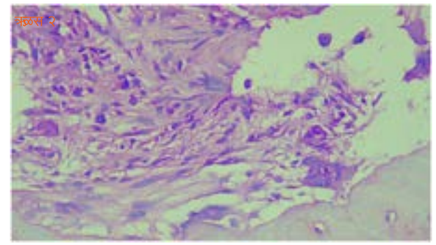


Fig 2. H&E staining 10x magnification: Bone marrow biopsy shows marked fibrosis and proliferation of osteoclastic giant cells (Arrow)

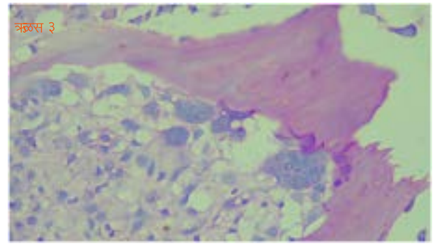


Fig 3. H&E staining 40x magnification: Bone marrow biopsy shows proliferation of osteoclastic giant cells (Arrow)

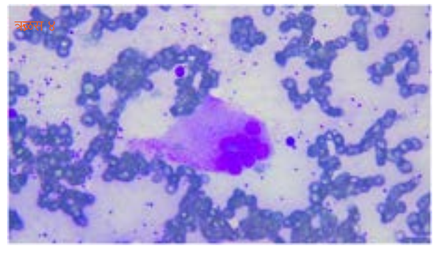


Fig 4. Leishman staining 40xmagnification: Bone marrow aspiration shows osteoclastic giant cell.

02 CASE REPORT - 1

RADIOTHERAPY IN THYROID EYE DISEASE

DR. SAMEER CHANDORKAR, Head of Department & Chief - Department of Radiation Oncology

ABSTRACT

The most common systemic manifestation of Graves' disease is Thyroid Eye Disease (TED), also known as Thyroid Associated Orbitopathy (TAO) or Graves' Orbitopathty (GO). TAO is typically a self-limiting auto-immune process associated with dysthyroid states. Smoking increases the incidence and severity of TAO. The diagnosis of TAO is established based on clinical findings, presence of thyroid stimulating hormone-receptor (TSH-R) antibody and imaging characteristics. CT scan and MRI are the cornerstones for evaluating TAO. Disease may present in active or inactive stage which dictates the therapeutic approach. Visual dysfunction from optic neuropathy, inflammation, and strabismus and cosmetic concerns are the priority factors considered for treatment in that order. Treatment options include corticosteroids, radiotherapy, and/or orbital decompression.

CASE PRESENTATION

A 29 year old male presented to our hospital with complaints of protrusion of right eyeball since two years and history of heaviness and pain in the right eye during eye movement more so during upward gaze. The first ophthalmic consultation and CT scan done in 2020 was indicative of bulky inferior rectus muscle along with perilesional and mild retrobulbar fat stranding with mild proptosis of the right eye. No bony erosion or destruction was present. Blood picture was suggestive of hyperthyroidism. Thyroid scintigraphy showed homogenous tracer distribution with both the lobes of thyroid with low normal tracer uptake. A diagnosis of thyroid eye disease was made and the patient was treated with two courses of steroids outside. His eye signs and symptoms did not respond and he was further treated with azathioprine and methotrexate. He underwent tarsography in 2021. Patient did not show any improvement. Endocrinology opinion was taken, thyroid function tests were done (which were found to be within normal limits). The patient was referred to us for radiation therapy as he refused further surgery and had exhausted all other options.

On examination the patient was of strong build and very good general conditions, all vitals normal, right eye showed frank proptosis and mild proptosis in left eye. MRI of both the eyes was done showing bulky right sided extraocular muscles with altered signal intensity appearing isointense on T1WI, heterogenously hyper intense on T2WI & STIR sequences with mild degree of homogenous post contrast enhancement. There was significant hypertrophy of the muscles bellies than tendons. Mild adjacent retro-orbital fat stranding was noted along the lateral and inferior rectus muscles. Right superior oblique muscle showed fatty infiltration. Proptosis of true right orbital globe was also noted. Compared to the previous scan done eight months back no interval change was reported. Due to the nature of his complaints patient was explained about radiotherapy as a treatment option, its side effects and prognosis. Patient consented for IMRT.

A three clamp orfit was made with the patinet in supine position and neck in neutral position and slice thickness was kept at 2.5 mm. Retroorbital tissue in both eyes was contoured as target (CTV) with PTV being generated as a 5 mm margin over CTV to avoid any set up misses, and eye balls, lenses and optic nerves were marked as organs at risk. Clinical target volume (CTV) encompassedthe origins to insertions of the extra-ocular muscles and the retroorbital fatty spaces with the main bulk. A total dose of 20 Gy was given to each patient in 10 fractions within two weeks by reversely planned 7-filed IMRT. The IMRT plans were verified to ensure that the 95% of the PTV received 95% of the prescribed dose (Fig. 1 through 5).

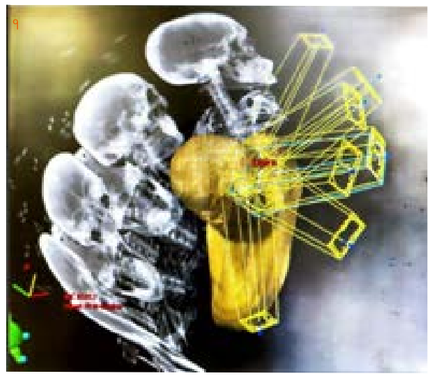
DISCUSSION

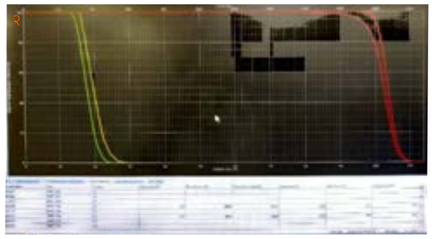
Graves' disease is the most common cause of hyperthyroidism worldwide, with an annual incidence of 20–50 cases per 100,000 persons (1). It has a strong female propensity and typically occurs in the third or fourth decades of life. As with most auto-immune disorders there is a strong familial component and Graves' disease is linked to HLA-B8 and -DR3 in Caucasians and HLA Bw35 in Asians.

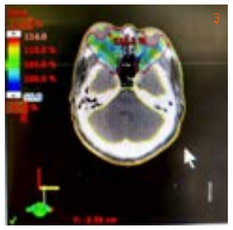
Systemic symptoms of hyperthyroidism include heat intolerance, fatigue, and anxiety. Physical signs in a patient with Graves' disease often include sweating, tremor, a diffuse goiter, weight loss, digital clubbing, pretibial myxedema, and numerous cardiovascular changes, including tachycardia, arrhythmias, and bounding peripheral pulses (2).

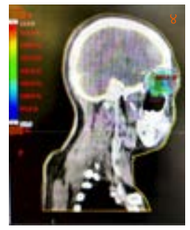
The most common systemic manifestation of Graves' disease is Thyroid Eye Disease (TED), also known as Thyroid Associated Orbitopathy (TAO) or Graves' Orbitopathty (GO), which is manifest in up to 50% of patients (3). TAO is typically a

Fig. 1 and 2 depicting fields used for IMRT and the DVH respectively









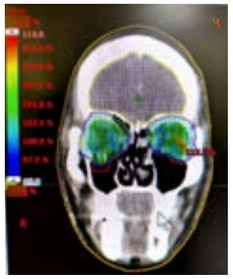


Fig. 3-5 (Left to Right) showing PTV coverage in axial, Sangita's and coronal planes

self-limiting auto-immune process associated with dysthyroid states. Although 90% of patients with Graves' disease are hyperthyroid, a smaller subset of patients may be euthyroid or even hypothyroid, indicating that thyroid function tests alone are insufficient to make the diagnosis of Graves' disease (5). In Graves' disease antibodies are directed against TSH-receptors present on thyrocytes resulting in excess thyroid hormone production (4). The estimated incidence of TAO in general population is 16 females and 3 males per 1,00,000 person years. Severe disease accounts for no more that 3%-5% of cases. The incidence of TAO is more common in Europeans than in Asians. Although TAO is more common in females than in males but as the severity of the disease increases the percentage of males forming that population steadily increases. Smoking also increases the incidence of TAO. The most recent grading systems of the thyroid eye disease are the VISA (vision, inflammation, strabismus and appearance) classification and the EUGOGO (European Group of Graves' Orbitopathy) classification. Both assess the activity and severity of the disease.

The diagnosis of TAO is established based on clinical findings, presence of thyroid stimulating hormone-receptor (TSH-R) antibody and imaging characteristics (6). Eyelid retraction is an important sign, other symptoms being lagopthalmos, proptosis, edema and erythema. The most significant pathological findings in TAO include glycosaminoglycan (GAG) deposition, fibrosis affecting the extraocular muscles, and fat deposition in the orbit (7-10). Computed tomography (CT) is the most commonly utilized imaging technique for evaluating TAO. CT is more sensitive than magnetic resonance imaging (MRI) in identifying enlarged extraocular muscles (11). Findings on CT scanning may include muscle belly enlargement that typically spares the tendinous insertions, an apparent increase in orbital fat volume, and crowding of the optic nerve at the orbital apex. Disease may present in active or inactive stage which would dictate thetherapeutic approach. The decision whether the opthalmopathy should be treated and what type of treatment is given is governed by the activity and severity of the disease. Visual dysfunction from optic neuropathy, inflammation, and strabismus and cosmetic concerns are the priority factors considered for treatment in that order.

Glucocorticoids are the mainstay of treatment for TED. Immediate treatment with high dose steroids is needed for patients whose vision is threatened by optic neuropathy. They may also be used for treating patients with moderate to severe active opthalmopathy. If glucocorticoids fail to improve optic neuropathy urgent orbital decompression is needed. Exposure keratopathy not relieved by local measures is also an urgent indication of surgery.

Indications for radiotherapy can be to induce clinical regression, reduce or eliminate functional deficits eg visual loss and diplopia, relieve ocular pain, improve aesthetics and avoid or decrease the undesired effects of other treatments or in patients who can't tolerate steroids and in those who refuse surgery. Radiation therapy is now a days generally delivered conformally and a dose of 20 Gy in 10 fractions is the most used regimen.

It is reported in literature that orbital pain, extraocular muscle dysfunction and tearing respond the best to radiation while proptosis and blurring of vision are the most refractory symptoms. The side effects of radiation are usually mild as the dose used for treating Graves' opthalmopathy is well within the tolerance of most of the structures. Red eye, loss of hair around the sideburns and madarosis are encountered. Chronic xerophthalmia, cataracts and second malignancy (though not reported till date in post radiation cases of Graves' opthalmopathy cases) are the possible late complications.

Our case who presented as **refractory to medical management** was treated with 6 MV photons using IMRT for a dose of 20 Gy/10 # over 2 weeks. Towards the end of radiation the patient reported decreased sense of heaviness right eye and 2 days post radiation he reported to be having **decreased discomfort** overall and absolutely no problems with upward guaze with improved eye moment in all directions. Now monthly follow up is planned.

REFERENCES

1. Chen HC, Kohner EV. Endocrine disease and the eye. In: Duane's Clinical Ophthalmology. Lippincott Williams & Wilkins, 2006:1-22.
2. Bahn RS. Graves' ophthalmopathy. N Engl J Med 2010;362:726-38.
3. Wiersinga WM, Bartalena L. Epidemiology and prevention of graves' ophthalmopathy. Thyroid 2002;12:855-60.
4. Prabhakar BS, Bahn RS, Smith TJ. Current perspective on the pathogenesisof Graves' disease and ophthalmopathy. Endocr Rev 2003;24:802-35.
5. Bahn RS. Graves' ophthalmopathy. N Engl J Med 2010;362:726-38.
6. Krassas GE, Wiersinga WM. Thyroid eye disease: current concepts and the EUGOGO perspective. Thyroid Int 2005;4:3–4.
7. Bahn RS, Heufelder AE. Pathogenesis of Graves' ophthalmopathy. N Engl J Med 1993;329:1468-75.
8. Feldon SE, Weiner JM. Clinical significance of extraocular muscle volumes in Graves' ophthalmopathy: A quantitative computed tomography study. Arch Ophthalmol 1982;100:1266-9.
9. Nunery WR, Nunery CW, Martin RT, Truong TV, Osborn DR. The risk of diplopia following orbital floor and medial wall decompression in subtypes of ophthalmic Graves' disease. Ophthal Plast Reconstr Surg 1997;13:153-60.
10. Smith TJ, Hoa N. Immunoglobulins from patients with Graves' disease induce hyaluronan synthesis in their orbital fibroblasts through the self-antigen, insulin-like growth factor-I receptor. J Clin Endocrinol Metab 2004;89:5076-80.
11. Polito E, Leccisotti A. MRI in Graves orbitopathy: Recognition of enlarged muscles and prediction of steroid response. Ophthalmologica 1995;209:182-6.

SBRT

Our state of art radiation machines at NCI are capable of delivering highly precise radiation therapy called SBRT. We are treating increasing number of cases with SBRT. In properly selected cases it improves cancer control.

BLOG

Dr. Mahesh Upasani, Consultant Radiation oncologist, NCI

02 CASE REPORT - 2

BURKITT'S LYMPHOMA PRESENTING AS INTUSSUSCEPTION IN FIVE CHILDREN

DR NITIN MANWANI, Consultant - Paediatric Intensivist

Dr Pankaj Dwivedi,
Dr Atul Kapse,
Dr Parikshit Tiple,
Dr Madhbika Chakraborti
Department of Pediatric Oncology, National Cancer Institute

Case Presentation:

Burkitt's lymphoma, a highly malignant and rapidly growing B-cell Neoplasm commonly manifests as swelling of lymph nodes in various parts of the body and its presentation as Intussusception is not common in children. As per literature, 20% of abdominal burkitt's lymphoma can present with intussusception. Out of the 12 children with Burkitts lymphoma treated at our hospital in last 3 ½ years, 5 had intussusception as initial presentation. All of them presented with abdominal pain varying in duration from 1 week to 1 month and ultrasonography (USG) picked up intussusception with a lead point. They underwent exploratory laparotomy and all had a mass as the lead point. The mass along with the diseased bowel was resected and anastomosis was done. The enlarged mesenteric lymph nodes were biopsied. They were referred to us after confirmation of histopathological diagnosis of Burkitt's lymphoma. All of them were treated successfully with NHL BFM -95 protocol. Four children were given Inj Rituximab along with chemotherapy. All 5 children are doing well on follow up with mean follow up duration of 1.5 years.

Learning points:

1) Burkitt lymphoma is a highly malignant, rapidly growing and aggressive neoplasm that the pediatric surgeon should consider when faced with a child more than 3 years old with intussusception .
2) The suspicion of a pathological lesion lead point in the intussusception and presentation of the intussusception at ages beyond the normal often necessitates surgery.
3) Surgery is the gold standard in both diagnosis and treatment, ensuring the excision of the entire tumor with free margins.
4) A multi disciplinary team with an oncologist assures efficient therapeutic management.

BURKITT'S LYMPHOMA IS A HIGHLY MALIGNANT BUT HIGHLY CURABLE CHILDHOOD CANCER. RAPID DIAGNOSIS, RAPID INITIATION OF TREATMENT AND WELL CO-ORDINATED TEAM WORK ARE CRUCIAL IN SUCH PATIENTS

DR. PANKAJ DWIVEDI, Pediatric Oncologist, NCI

02 CASE REPORT - 3

PHAEOCHROMOCYTOMA.... TACHYCARDIA FOR PATIENTS AS WELL AS DOCTORS!!

DR. ABHINAV DESHPANDE, Consultant /Professor - Department of Surgical Oncology

Dr Gopal Gurjar
Dr Sumit Gathe ,
Dr Abhiram Mundle ,
Department of Surgical Oncology , NCI Nagpur

INTRODUCTION:

Pheochromocytoma (PCC) is a rare neuroendocrine tumor, with a prevalence ranging between 0.1% and 0.6% in patients suffering from arterial hypertension(1). Clinically inapparent, asymptomatic adrenal tumors identified by an imaging study performed for another indication are referred to as incidentalomas. The frequency of adrenal incidentalomas found on abdominal imaging studies is 1% to 4%(2). The majority (36%–94%) are small, nonfunctioning, benign cortical adenomas; however, some are found to be functioning or malignant. The prevalence of adrenocortical carcinoma among incidentalomas is approximately 5%(3).

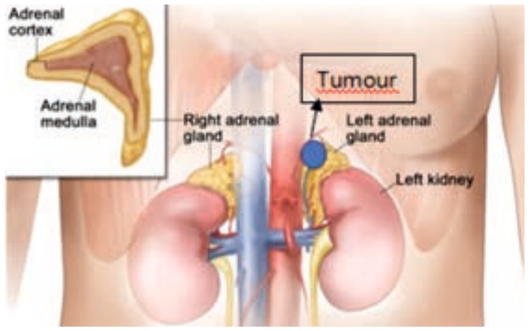
CASE HISTORY & BACKGROUND:

A 33 year old female presented to the out-patient department with a history of gradually increasing swelling over her right arm.

The swelling was diagnosed as a high grade sarcoma on cytology. The swelling was excised and was confirmed to be a peripheral nerve sheath tumor on immunohistochemistry. The patient subsequently received local radiation.

On a routine metastatic workup, on CECT abdomen, an approximately 3 x 3cm mass was seen over left upper renal pole. The features were suggestive of a pheochromocytoma. Urinary free nor metanephrins were significantly raised.

After all pre-operative workup, physician & anaesthesia fitness was taken. Since patient was asymptomatic and vitals were stable , no alpha or beta blockade was done. The patient was planned for a laparoscopic excision of the pheochromocytoma.



LAPAROSCOPIC ADRENALECTOMY:

Minimally invasive adrenalectomy is the gold standard for the treatment of adrenal tumors 6 cm in diameter and weighing <100 g. (4)

OUR TECHNIQUE:

We performed left laparoscopic adrenalectomy using transperitoneal laparoscopy, with the patient positioned in the lateral decubitus.

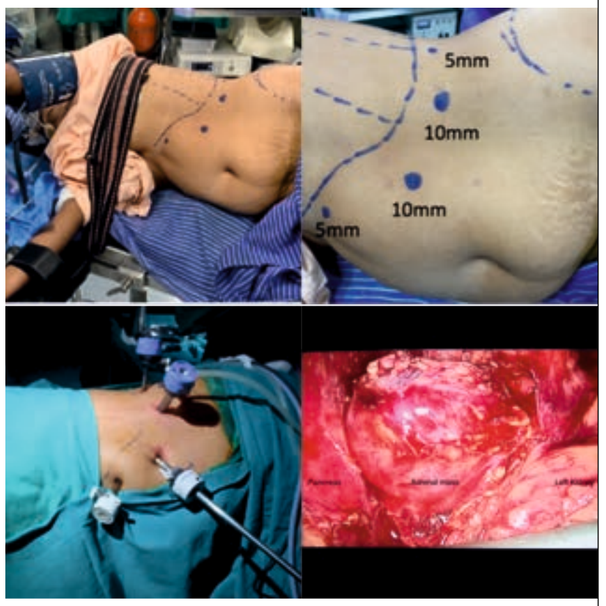
Four trocars were inserted as shown in the image (Two 10mm, two 5mm)

Carbon dioxide pneumoperitoneum was kept at 12 mmHg.

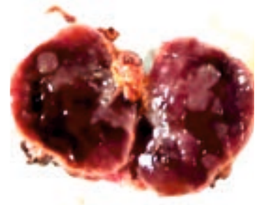
The splenic flexure of colon was mobilised and brought down. Splenic artery and vein were identified. Upper border of pancreas was identified. The renal hilum was identified.

According to "vein first" technique, the main adrenal vein was identified and divided between clips. Haemodynamic alterations are expected during this step and carefully managed. Seperation of the adrenal from Gerotas is to be done.

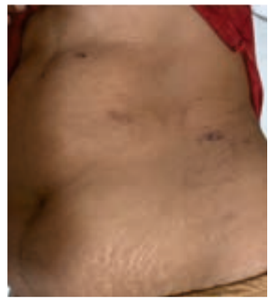
The mass along with left adrenal gland was separated free from all structures and was delivered out in a specimen bag through the port site.



PATIENT POSITION



INTRAOPERATIVE PICTURE



FOLLOW UP PICTURE

SURGICAL RISKS:

Important surgical risks and considerations while doing laparoscopic adrenalectomy are encountered mainly due the complex anatomy and relations of the adrenal gland.

Potential risks include:

Bleeding: Blood loss during this procedure is typically minor (less than 100 cc) and a blood transfusion is needed in less than 5% of patients.

Tissue / Organ Injury: Although uncommon, possible injury to surrounding tissue and organs including bowel, vascular structures, spleen, liver, pancreas, kidney and gallbladder could require further surgery. Injury could occur to nerves or muscles related to positioning.

Conversion to Open Surgery: The surgical procedure may require conversion to the standard open operation if difficulty is encountered during the laparoscopic procedure. This could result in a larger standard open incision and possibly a longer recuperation period.

Anaesthetic considerations:

Preoperative sympatholytic therapy with alpha- and beta-adrenoreceptor blockers and fluid resuscitation remains the standard of care for the patient with pheochromocytoma (5).

The most commonly employed anaesthetic technique for the resection of pheochromocytoma is general endotracheal anaesthesia with neuraxial blockade via an epidural catheter (6).

The main goal of the anaesthetic management is to anticipate and treat surges of sympathetic discharge.

Despite preoperative adrenergic blockade, labile intraoperative hemodynamics are common (7).

Availability of fast acting antihypertensives and the avoidance of drugs that stimulate the sympathetic autonomic system are necessary.

In conclusion , Laparoscopic adrenalectomy is a challenging procedure. The morbidity as well as cosmetic aspects for the patient can be significantly alleviated as compared to the open procedure.

Phaeochromocytomas are notorious , as even a small sized tumours can lead to drastic implications on the human body. Effective preop preparation, multidisciplinary consultations, proper anaesthesia and surgical planning are the hallmarks for successful treatment of Adrenal tumours.

References:

1. Lenders JW, Eisenhofer G, Mannelli M, Pacak K. Phaechromocytoma. Lancet 2005;366:665e75.
2. Duh QY. Functioning and nonfunctioning adrenal tumors. In: Bland KI, editor. The practice of general surgery. Philadelphia: W.B. Saunders; 2002. p. 1077–82.
3. Brunt LM, Moley JF. Adrenal incidentaloma. World J Surg 2001;25(7):905–13.
4. Gagner M, Pomp A, Neniford BT, Pharand D, Lacroix A. Laparoscopic adrenal- ectomy: lessons learned from 100 consecutive procedures. Ann Surg 1997;226: 238e46.
5. Iseri LT, Henderson HW, Derr JW (1951) The use of adrenolytic drug, regitine, in pheochromocytoma. Am Heart J 42:129–36
6. Prys-Roberts C (2000) Pheochromocytoma – recent progress in its management. Br J Anaesth 85:44–57

   Kinney MAO,Warner ME, van Heerden JA, Harlocker TT, Young WF Jr, Schroeder DR, Maxson PM, Warner MA (2000) Preanesthetic risks and outcomes of pheochromocytoma and paraganglioma resection. Anesth Analg 91:1118–23

Leutetium Therapy

Theranostic is a rapidly evolving field in cancer therapeutics. At NCI we have commissioned nuclear medicine therapeutics in the form of Leutetium for prostate cancer and neuroendocrine therapy. We have successfully treated initial few patients and we are keeping them under close follow up to see the efficacy of the treatment

BLOG

Dr. Chaitali Bongulwar and **Dr. Kaushik Chatterjee,** NMD, NCI

02 CASE REPORT - 4

Moving from Maximum Tolerable ... to Minimum Effective..... Breast Conservative Surgery with Donut Mastopexy (Benelli's) Reconstruction

DR ABHINAV DESHPANDE, Consultant /Professor - Department of Surgical Oncology

Dr Gopal Gurjar,
Dr Pranam Sadawarte,
Dr Sumit Gathe,
Dr Abhiram Mundle,
Department of Surgical Oncology , NCI Nagpur

INTRODUCTION:

The entire perspective of a woman right from self image to social outlook including future is turned upside down on being diagnosed with breast cancer threatening her physical, emotional, and sexual aspects. Advancements in oncoplastic techniques have enhanced commitment to restore shape and, hence, has improved cosmetic outcomes.

The very concept of Oncosurgery is slowly moving from maximum tolerable treatments to minimum effective treatments over the past few decades.

The two major trials of NSABP-B06 (1) and MILAN(2) have categorically stressed upon near equivalent long term outcomes including overall survival between BCS and MRM.

They formed the pillars on which stands the edifice of emerging conservative surgeries.

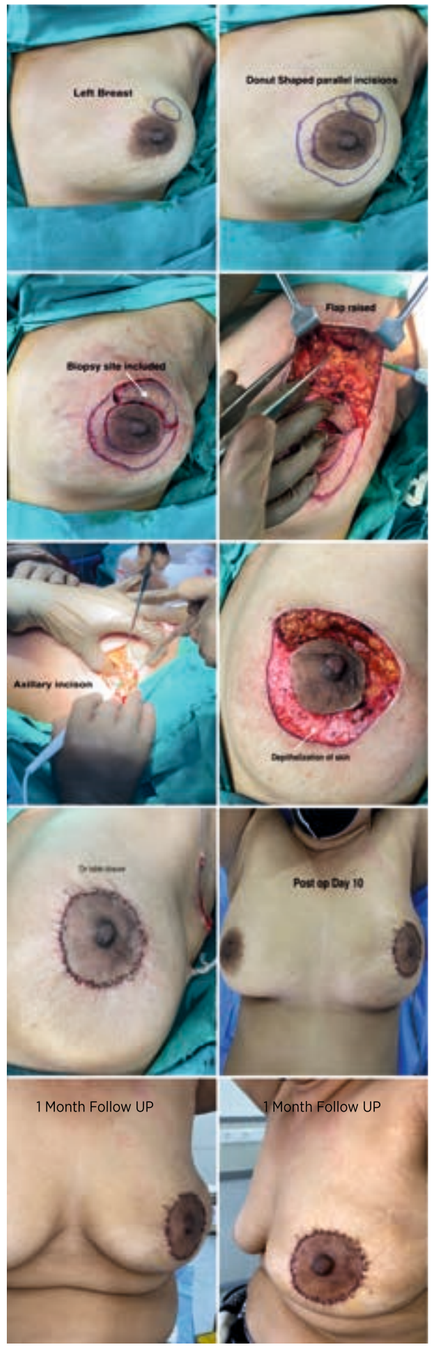
The multidisciplinary approach to diagnosis and advancements in breast oncoplastic techniques enhance the commitment to restore the shape and hence cosmesis.

Donut mastopexy lumpectomy is one such technique and is best utilized in a setting of a malignancy not extending to the skin or the nipple-areolar complex (3). As a potential alternative to standard lumpectomy, it has many advantages including restriction of scar to the periareolar region, ease and rapidity of surgery, retention of nipple-areolar sensation, and the possibility of performing augmentation mammoplasty.

An access to most of the tumor locations in the breast is provided with DML while confining the incision to the areolar margins only. It utilizes a pair of concentric circumareolar skin incisions; first placed at areolar margin and a second whose radius is no less than 1 cm longer. The intervening ring of skin is deepithelialized and wide skin flaps are developed over the index and flanking quadrants to enable wide local excision of malignancy. Reconstruction of the gland is undertaken by undermining, advancing, and performing a layered closure of the flanking glandular breast tissue using absorbable sutures. Closure of skin uses an absorbable purse-string suture placed in the outer skin margin to reduce its diameter to that of normal areola and then completed with suturing of these two skin margins together, forming the new areolar margin(4) (5).

CASE REPORT:

The present case was a 40-year-old female who presented to us at NCI, with a left-sided breast lump (3x3cm) in the upper outer quadrant (cT2N1).(Fig 1) Core biopsy revealed an infiltrating ductal carcinoma grade II [ER + PR + Her2Neu -]. Metastatic work up was negative. She underwent a donut lumpectomy with frozen section in which margins were confirmed to be negative. Axillary lymph node dissection was done with a separate incision since axillary node was proven malignancy by pre-op FNAC, so no SLNB . Final histopathology revealed a pT2N1 infiltrating ductal carcinoma breast . She is doing fine till 8 weeks follow-up and is started on Adjuvant treatment.



The advantages of DML are multiple as of restriction of the scar to the periareolar region only, ease and rapidity of surgery, retention of nipple-areolar sensation, and possibility of performing augmentation mammoplasty.

The principle technical disadvantages of this approach are areolar spreading, globular shaped breast, and hypertrophic scarring. DML may not be appropriate for lower pole lesions and very ptotic breasts.

Breast conservation with Oncoplasty is an emerging at the same time established modality in the management of Breast cancer. The newer techniques of Oncoplasty and reconstruction have revolutionised the outlook as well as the expectations. This has definitely improved a woman's self perception as well as social acceptability rendering a much better quality of life.

References:

1 Fisher B, Jeong J-H, Anderson S, Bryant J, Fisher ER, Wolmark N. Twenty-five-year follow-up of a randomized trial comparing radical mastectomy, total mastectomy, and total mastectomy followed by irradiation. N Engl J Med 2002;347:567-75.

2 Veronesi U, Zucali R, Luini A. Local control and survival in early breast cancer: the Milan trial. International Journal of Radiation Oncology* Biology* Physics. 1986 May 1;12(5):717-20.

3 Giacalone PL, Dubon O, Roger P, El Gareh N, Rihaoui S, Daures JP. Doughnut mastopexy lumpectomy versus standard lumpectomy in breast cancer surgery: a prospective study. Eur J Surg Oncol. 2007;33:301–306. doi: 10.1016/j.ejso.2006.09.014.

4 Holmes DR, Schooler W, Smith R. Oncoplastic approaches to breast conservation. Int J Breast Cancer. 2011;2011:1–16. doi: 10.4061/2011/303879.

5 Daga G, Kumar R. Donut Mastopexy Lumpectomy. Indian J Surg Oncol. 2019 Jun;10(2):372-373. doi: 10.1007/s13193-018-0865-0. Epub 2019 Jan 4. PMID: 31168264; PMCID: PMC6527661.

02 CASE REPORT - 5

Intrahepatic Bile Duct Adenoma Masquerading as Hepatic Metastasis in a case of Carcinoma Rectum

DR. SUSHIL PANBUDE, Junior Consultant-Department of Radiology

Dr. Shashikant Juvekar, Department of Radiology, National Cancer Institute, Nagpur, India.
Dr. Meena Pangarkar, Department of Pathology, National Cancer Institute, Nagpur, India.
Dr. Amol Gulkari, Department of Radiology, National Cancer Institute, Nagpur, India.

ABSTRACT

Intrahepatic bile duct adenoma (BDA) is a rare benign tumor arising from the epithelium of the intrahepatic bile duct. In oncology, when a new onset hepatic nodule develops, it is often looked with suspicion for metastasis. However, many of these small liver nodules can be benign. Hence, it is important to obtain tissue for cytological/histopathological diagnosis before labeling it as disease progression. We report imaging findings of bile duct adenoma, which was discovered during surveillance CT scan and was a new finding in a treated case of carcinoma anorectum. Since the new-onset, it was suspicious for metastasis on imaging. Ultrasound-guided FNAC was performed to confirm its etiology and the cytology report showed findings of bile duct adenoma.

Keywords: Liver, Bile duct adenoma, metastasis, carcinoma rectum.

CASE HISTORY:

A 46-years-old female, a known case of adenocarcinoma of the rectum, received neoadjuvant chemo- radiotherapy and underwent posterior exenteration surgery. Histopathology report of the primary revealed a small residual focus of viable adenocarcinoma without nodal involvement. She received adjuvant chemotherapy and was on surveillance at a tertiary referral oncology center. Surveillance contrast-enhanced CT scan of abdomen and pelvis was obtained 9 months after the surgery on a 16- slice GE Discovery CT scan machine. Pre contrast plain images and post-contrast images in port venous phase (60 seconds after intravenous injection of iodinated contrast) and delayed / equilibrium phase (180 seconds after intravenous injection of iodinated contrast) were obtained. Arterial phase images were not obtained, as it was a routine surveillance CT scan. CT scan revealed a 14 mm-sized hypodense lesion in the right lobe of the liver, which was not evident on the previous pre-op CT. The liver lesion was hypoattenuating on pre-contrast plain images and post-contrast images in the port venous phase while showing hyperattenuating on delayed / equilibrium phase images. It was located at the periphery. (Fig. 1). Since it was a new onset lesion in a known case of carcinoma, it was suspicious for metastasis. The liver lesion seen on the CT scan did not show FDG uptake on the FDG PET-CT scan. (Fig. 2). Still, it was suspicious for metastasis since was new-onset. There is no evidence of metabolically active disease elsewhere in PET-CT. The case was discussed in the multidisciplinary tumor board and to know the exact pathology, whether benign or malignant, it was referred to us for ultrasound (USG) guided FNAC. When the patient was taken for ultrasound-guided FNAC, pre-procedural USG reveals an isoechoic lesion with a thin peripheral rim of hypoechogenicity (Fig. 3). Under all aseptic precautions & local anesthesia, USG guided FNAC was done with a 25 G spinal needle. Smears were prepared from the aspirate and sent for cytological examinations. On cytology, smears were cellular and showed groups of cuboidal epithelial cells with uniform nuclei, fine chromatin, and scanty cytoplasm. There was no atypia or mitoses. (Fig. 4) Hence cytological diagnosis was benign bile duct lesion, bile duct adenoma. The absence of atypia and mitoses ruled out metastasis and other neoplastic lesions like cholangiocarcinoma. In addition, the absence of dilated lumina and intraluminal bile ruled out Von Meyenberg Complexes. The patient was then put on routine surveillance.

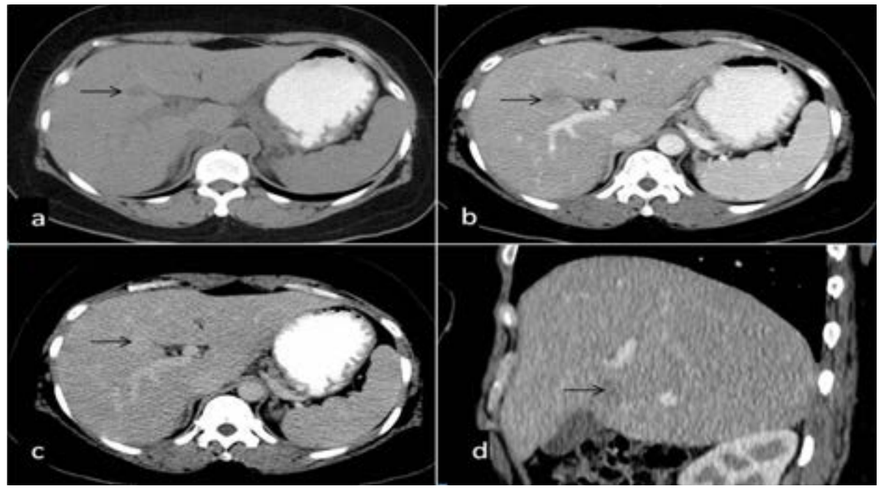


Figure 1: Axial CT scan non contrast (a) images and post contrast images in portovenous (b) and delayed phase (c) images show a hypodense nodule (arrows) which is hypoattenating to liver parenchyma on non contrast and post contrast portovenous phases, while is hyperattenuating

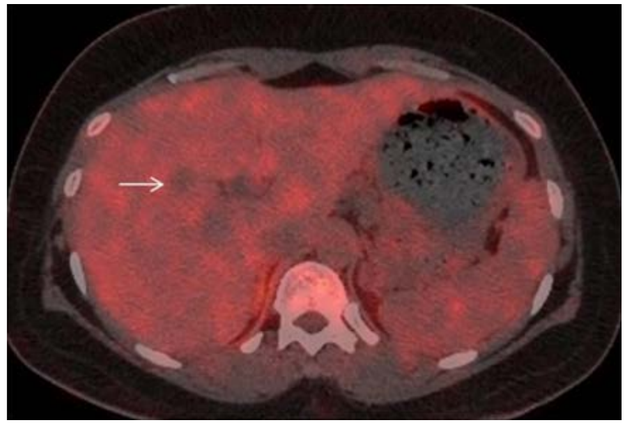


Figure 2:
Axial fused images of PET CT scan shows no uptake in liver lesion (arrow)

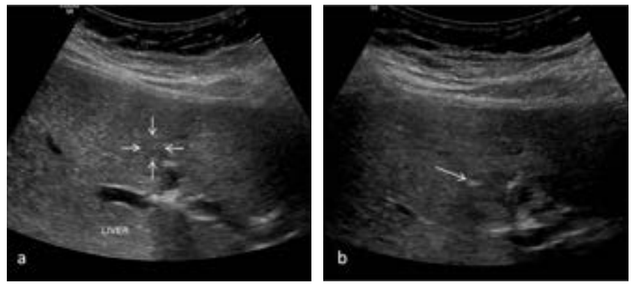


Figure 3:
(a) Ultrasound images shows an isoechoic lesion with thin peripheral halo (marked with arrows).
(b) USG guided FNAC was done. Arrow shows an echogenic tip of the needle in the liver lesion.

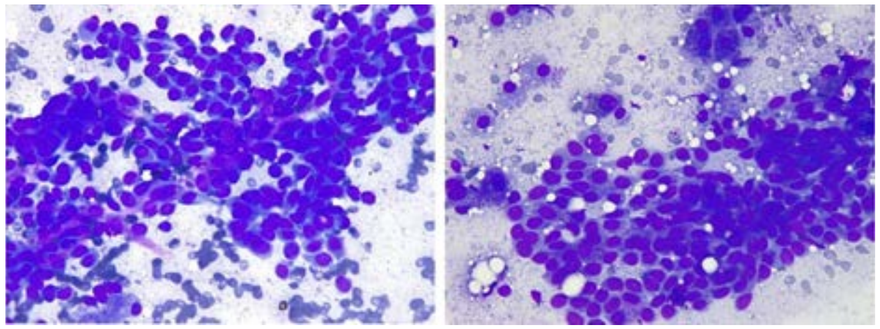


Figure 4: MGG stain 40x. It shows uniform cuboidal bile duct epithelial cells, with monomorphic nuclei, scanty cytoplasm. No atypia and no mitoses seen.

Discussion:

Bile duct adenoma is a rare benign tumor arising from the epithelial cells of the intrahepatic bile duct. [1,2,3] The largest studies to date by Allaire et al [1], a study of 152 cases, found that most bile duct adenoma is asymptomatic and found incidentally during the intrabdominal surgery (103 case) or at autopsy (49). Bile duct adenoma constitutes around 1.3% of liver tumors. They are usually subcapsular in location, range from 1 to 20 mm in size and were well-circumscribed but non encapsulated. The majority occurred in patients between 20 to 70 years, with a mean age of 55 years. [1]

Microscopically, BDA is seen as the proliferation of disorganized and mature peribiliary gland acini and ductules within a variable amount of connective tissue stroma with signs of chronic inflammation and collagenization. There is no atypia or mitosis, which helps in distinguishing them from cholangiocarcinoma. BDA can also be confused with bile duct hamartoma (Von Meyenberg Complex), but lack of dilated lumina and intraluminal bile helps differentiate BDA from hamartoma. [4]

On ultrasound, BDA appears as a hyperechoic nodule with or without a surrounding halo. They can be isoechoic to the liver and could not be identified or can be hypoechoic. [5,6] In our case, BDA was isoechoic to the liver parenchyma and shows a thin peripheral hypoechoic rim (peripheral halo).

On an unenhanced CT scan, BDA is hypodense. It can appear hyperdense which is due to calcifications within. [7] In arterial phase images, hyperenhancement is a common feature but may appear hypodense. [6] They are hyperattenuating relative to liver parenchyma on port venous and equilibrium phase images. [5,6,8] This delayed enhancement is likely due to fibrous stroma which is seen in BDA. [6,9] This enhancement may vary depending upon the amount of fibrous stroma and may appear hypodense on delayed phase images. [6] In our case, BDA was hypoattenuating to the hepatic parenchyma on the port venous phase and hyperattenuating on delayed phase images.

On MRI, BDA appears as hypointense relative to liver on T1-weighted images, hyperintense on T2- weighted images, and hyperintense on DWI. BDA also demonstrated characteristic features on dynamic enhanced MRI, i.e., hyperenhancement in portal venous and delayed phase images.[6,10,11] However, there are case reports which showed hypointense signal [7] and isointense signal [8] on T2 weighted images. MRI was not done in our case.

To our knowledge, there is no data in the literature about the role of FDG PET in intrahepatic BDA. Our case showed no uptake on FDG PET which was in favor of benign findings. However, some low-grade tumors, mucinous tumors and small lesions may not show FDG uptake [12] and given known primary malignancy with the new-onset liver lesion, it was reported as suspicious for metastasis.

In patients with known malignancy, definite characterization of small liver lesions into benign vs. malignant is crucial in determining the prognosis and treatment. Jones et al[13] reported in their study that liver lesions less than or equal to 15 mm were found in 17% of the cases and were benign in 51% of the 82% of patients with known malignancy. Schwartz et al[14] in their study reported that hepatic lesions less than or equal to 1 cm, deemed too small to characterize, are most often benign, but approximately 11.6 % of these lesions were malignant. Schwartz et al also reported in their study that when these too small to characterize liver lesions were followed, the average reported time for an increase in the size of these TSTC liver lesions was 13 months if malignant in etiology. Therefore, it is helpful to obtain tissue for cytological/histopathological examination to obtain an accurate diagnosis and for better patient care.

"In conclusion, BDA, a rare primary liver tumor, have variable imaging characteristics ultrasound, but on dynamic contrast enhanced CT and MRI scans show arterial phase enhancement with progressive enhancement on delayed phase images, which are characteristics of BDA". However, some unusual imaging findings such as hypoattenuation on the equilibrium phase of CT scan are also reported in the literature. Being the rare tumor and possibility of unusual imaging findings, in a patient with known primary cancer, it is preferable to obtain tissue for cytology/histopathology to differentiate it from metastasis, which is more common than BDA.

References:

1. Allaire GS, Rabin L, Ishak KG, Sesterhenn IA. “Bile duct adenoma. A study of 152 cases”. Am J Surg Pathol. 1988;12(9):708-715
2. .J Craig, R Peters HE. “Atlas of Tumor Pathology, Second Series, Fascicle 26: Tumor of the Liver and Intrahepatic Bile Ducts.; 1989”.
3. Edmondson HA. “Atlas of Tumor Pathology. Washington DC: Armed Forces Institute of Pathology.; 1958”.
4. Christine AL EM. “Gastrointestinal and Liver Pathology”. Philadelphia, Churchill Livingstone.; 2005.
5. Kim YS, Rha SE, Oh SN, et al. “Imaging findings of intrahepatic bile duct adenoma (Peribiliary gland hamartoma): A case report and literature review”. Korean J Radiol. 2010;11(5):560-565.
6. Chuy JA, Garg I, Graham RP, Vanburen WM, Venkatesh SK. “Imaging features of bile duct adenoma: Case series and review of literature”. Diagnostic Interv Radiol. 2018;24(5):249-254.
7. Maeda E, Uozumi K, Kato N, et al. “Magnetic resonance findings of bile duct adenoma with calcification”. Radiat Med - Med Imaging Radiat Oncol. 2006;24(6):459-462.
8. Takumi K, Fukukura Y, Nagasato K, Nakajo M, Natsugoe S, Higashi M. “Intrahepatic Bile Duct Adenoma Mimicking Hepatic Metastasis: Case Report and Review of the Literature”. Magn Reson Med Sci. 2013;12(2):141-145.
9. “Intrahepatic peripheral cholangiocarcinoma: two-phased dynamic incremental CT and pathologic correlation” - PubMed. Accessed May 18, 2021.
10. Liang W, Xu S. “Magnetic resonance imaging findings of intrahepatic bile duct adenoma: A report of 4 cases”. J Comput Assist Tomogr. 2015;39(5):747-751.
11. An C, Park S, Choi YJ. “Diffusion-Weighted MRI in Intrahepatic Bile Duct Adenoma Arising from the Cirrhotic Liver”. Korean J Radiol. 14(5):769-775.
12. Kostakoglu L, Agress H, Goldsmith SJ. “Clinical Role of FDG PET in Evaluation of Cancer Patients”. Radiographics. 2003;23(2):315-340.
13. Jones EC, Chezmar JL, Nelson RC, Bernardino ME. “The frequency and significance of small (≤15 mm) hepatic lesions detected by CT”. In: American Journal of Roentgenology. Vol 158. AJR Am J Roentgenol; 1992:535-539.
14. Schwartz LH, Gandras EJ, Colangelo SM, Ercolani MC, Panicek DM. “Prevalence and importance of small hepatic lesions found at CT in patients with cancer”. Radiology. 1999;210(1):71-74.

HIPEC

Technology and newer concepts are making an impact on the surgical treatment of advanced ovarian cancer and HIPEC is one such example. In carefully selected patients, it appears to improve the outcome. Trials are going on globally to explore this technique further.

BLOG

Dr. Sameer Shrirangwar, Medical Oncologist, NCI

02 CASE REPORT - 6

NUTRITIONAL MANAGEMENT OF A PAEDIATRIC PATIENT SUFFERING FROM MULTIPLE DISORDERS

MS. GARGEE RAI, Consultant - Department of Dietician

BACKGROUND:

CASE DETAILS: 1 years 5 months old male child with no comorbidities underwent Chemotherapy for Pre B cell All Post 1st cycle of CT he developed multiple Complication

1. Acute lymphoblastic leukemia with acute gastroenteritis (Neutropenic enterocolitis)
2. Hypertensive encephalopathy (PRES)
3. Klebsiella sepsis
4. COVID-19 (LRTI)
5. Subacute intestinal obstruction post infectious(operated – exploratory laparotomy with resection and anastomosis)
6. Severe acute malnutrition with cleft palate

ASSESSMENTS: Nutritional assessment included anthropometry ,biochemical, clinical weight:4.9kg height:72cmWHO growth Standards-Severe Acute Malnutrition(SAM)(-3SD)

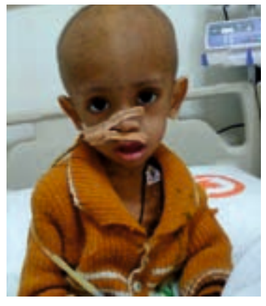
NUTRITIONAL NEEDS AND PLANNING: ESPHAGAN guidelines for calculating his nutritional requirement. Central line TPN was planned of 625ml later he progressed to Nasogastric feeding 70ml/2hrly with semi-elemental formula

125-200kcal/kg/day **protein:**3-4gm/kg/day **carbohydrate:** (50-65%) **fat :** 25-30% Adequate micronutrients and electrolyte correction was given

COMPLETE MANAGEMENT: he was TPN with omega 3 fatty acid+5 ml MVI and 3 ml trace elements alternate days, later he was weaned off from TPN and shifted to NGT semi elemental formula feeding starting from small volume 10ml/hr through syringe pump in continuous drip method to 15ml/hr to slowly increasing to 35ml/hr there were no episodes of loose stool, feeding intolerance and gained weight from 4.9kg to 6.5kg,MUAC increased from 8.5cm to 10cm in 15days of hospital stay we also added glutamine and carnitine supplementation for better result and healing .

FOLLOW UP- On 1st follow up Patient gained 1 kg weight 7.5kg and MUAC was increased to 12cm.

BEFORE



AFTER

03 ORIGINAL STUDY - 1

Significance of Minimal Residual Disease (MRD) in pediatric patient with acute lymphoblastic leukemia treated with non MRD based protocol: experience from tertiary care centre in Central India

DR. PANKAJ DWIVEDI, Consultant- Department of Paediatric Oncology

DR. KISHOR DESHPANDE, Consultant Pathology, Department of Pathology

Praveen C[1], **Atul Kapse**[1], **Nitin M**[1], **Sameer S**[2], **Nilesh** D[4], **Anand** P[3]

INTRODUCTION:

Minimal Residual Disease (MRD) (or measurable residual disease) after induction chemotherapy is a well known prognostic marker in childhood leukemia. Owing to its compelling evidence, most recent protocols include MRD as a guide to escalate or deescalate further therapy1. Post induction, negative MRD (<0.01%) predicts long term survival whereas positive MRD indicates aggressive biology of disease and relative resistance to chemotherapy drugs which warrants more aggressive strategies like hematopoietic stem cell transplant or immunotherapy2.

Around the world different groups have proposed different criteria for risk stratification of childhood Acute Lymphoblastic Leukemia (ALL) and some of them include MRD as one of the criteria. As per NCI criteria, risk stratification is based on presenting counts and age3. BFM group considers Age (<1yr or >6yr), presenting count (less than or more than 20000/cu.mm), ph t(9:22) and MLL translocation status as baseline risk factors4. Newer studies use MRD at various time points during chemotherapy to re-classify patients in various risk groups.

As most MRD data in ALL comes from western countries with scarcity of data in Indian children, we retrospectively analyzed our data of MRD in children with ALL and correlated MRD findings with established risk factors.

Material and Method: Retrospective analysis of all newly diagnosed Pediatric (1-16 years) ALL patients who received their induction chemotherapy between September 2017 to August 2020 was done. Patients Zwere treated with IC-BFM 2002 protocol5. Blood samples were taken at baseline for CBC, peripheral smear, liver function test, renal function test, serum LDH as routine practice. Bone marrow aspiration was done for flow-cytometry, cytogenetic and karyotyping. Peripheral smear was sent on D8 for steroid response. Bone marrow morphology done on Day 15. Post induction marrow aspiration was done and assessed for morphology and MRD on day 33. Patients were risk stratified into three risk groups as per IC-BFM2002 protocol: (1) SR defined as PGR (Prednisolone good response), age more than 1 year to less than 6 years, initial WBC less than 20x109 /L, andM1 (< 5% blasts) or M2 (≥ 5% to < 25% blasts) marrow on day 15, M1 marrow (less than 5% blasts)on day 33 (all criteria must be fulfilled); (2)Intermediate risk (IR), defined as PGR, age less than 1 year or more than 6 years, and/or WBC >20x109/L ,M1 or M2 marrow on day 15 and M1 marrow on day 33, or SR criteria but M3 (≥25% blasts) marrow on day 15 and M1 marrow on day 33;(3) HR, defined as at least one of the following: PPR (poor Prednisolone response),IR and M3 marrow on day 15, M2 or M3 marrow on day 33t(9;22) (BCR-ABL), or t(4;11) (MLL-AF4).

Aberrant marker defined as abnormal expression or loss of expression of cell specific lineage marker not associated with specific cell type6.Frequency of aberrant marker calculated and studied in relation to MRD.

For B cell ALL, Immunophenotyping was done on 10 color Beckman Coulter's Navios EX flow-cytometry. Antibodies used for B cell typing and for BMRD were CD10, CD19, CD20, CD34, CD38, CD58, CD73, CD86, CD123 and CD45 was used as gating marker to gate the blasts. 1 lac cells were acquired for diagnostic flow and 16 lacs for BMRD. Percent of BMRD positive blasts was calculated using viable cells as the denominator. For T cell ALL markers used were CD3, CyCD3, CD45, CD5, CD16/CD56, CD4, CD34, CD7, CD8 and CD387. As per established criteria for MRD assessment by flow-cytometry, value <0.01% taken as negative and more than or equal to 0.01% taken as positive MRD2.

TREATMENT: As per IC BFM 2002 risk stratification, patients were stratified as standard risk, intermediate and high risk. Intermediate and high risk (both T and B cell ALL got the same induction chemotherapy - 4 Daunorubicin), while B cell ALL standard risk received less intense chemotherapy (2 Daunorubicin). If D8 Prednisolone response was poor they were shifted to intermediate/high risk protocol5.

Statistical Analysis: Data was entered in MS Excel, coded and analyzed in statistical software STATA, version 10.1, 2011. Data analysis included both Descriptive and Inferential statistics. Descriptive statistics were used to summarize quantitative variables with mean, standard deviation (SD), or median, range. Frequency and percentages were used to summarize categorical (qualitative) variables. Inferential statistics mainly included Chi-square test or Fisher's exact test (for small frequencies) for assessing statistical significance of difference in various parameters expressed as proportions in two comparison groups. Significance of difference in means in two groups was assessed by a two-independent sample t-test with equal variances. Binary Multiple Logistic Regression (MLR) analysis was performed for assessing effect of baseline characteristics like age and cytogenetic on dichotomous (MRD) outcome.

A p-value <0.05 was considered statistically significant for all the comparisons.

Results: Total 68 children were included over a 3 year period in this study. Baseline patient characteristics and relevant investigations entered in Table 1. Median age was 6 years (range 1-16 years) with male preponderance (male: female = 1.83). Median total leukocyte count at presentation was 14560/cu.mm (range 272390-330/cu.mm). Presenting hemoglobin ranged from 2.4 to 13.1 gm/dl (median: 7.9 gm/dl).23%of total patients had aberrant markers. Table 2shows distribution of patients as per the type of ALL and CNS status. Majority i.e. 83.8% (57/68) were B cell ALL and 16%(11/68) were T cell ALL. In B cell ALL, cytogenetic analyses was done in 54 out of 57 patients for t(1:19), t(12:21), MLL translocation and t(9:22) Table 3. Translocation (12:21) was present in 8(15%) patients and was the commonest abnormality. Three (3.7%) were positive for t(9:22). Thirty seven children (68%) had normal cytogenetics.

Day 15 marrow was done for 53 children - 51 had M1, 1had M2 and 1 had M3 marrow status.

Table 4 shows baseline risk groups and re-risk stratification after seven days of steroid. Day 8 steroid response was available for all 68 patients. At presentation, based on age, presenting counts and cytogenetics,21 patients (30.8%) were in standard risk, 43 (63.2%) were in intermediate risk and 4 were in high risk group. One patient with intermediate risk had poor response to steroids on day 8 (i.e more than 1000 blast/cu.mmin peripheral smear) and was re stratified to high risk group.

Table-1 Demographic and lab parameters at presentation:

Demographics	Range	Median
Age	1-16 years	6years
Sex ratio	Male – 44 (64.7%) Female – 24 (35.3%)	
Lab Parameters	**Range**	**Median**
TLC(Per-cumm)	272390-330	14560
Hb (gm/dl)	3-13	7.9
Platelets (Per-cumm)	4000-375000	35000
Serum LDH(n=41)	136 -15708	762

Table-2: Patient distribution according to type of ALL and CNS status

Type of ALL	Distribution (n=68)
B cell ALL	57(83.8%)
T cell ALL	11(16.1%)
CNSI	65
CNSII	2
CNSIII	1

Table-3: Cytogenetic in B cell ALL: (n=54)

Cytogenetic parameters	Distribution
Normal cytogenetic	37(68.5%)
t(12;21)	8(14.8%)
t(1:19)	5(9.2%)
t(9:22)	3(5.5%)
MLL t(4:11)	1(1.4%)

Table-4: Risk stratification at baseline and after 7 days of steroid

Risk	Distribution (at presentation)	No. of poor steroid responder	Re risk stratification based on D8 response *
Standard risk	21(30.8%)	0	21
Intermediate	43(63.2%)	1	42
High risk**	4(5.88%)	0	5

MRD DATA:

Seven out of Sixty-Eight children (10%), had positive MRD after 1 month of induction. All were pre- B ALL. All standard risk except 1had negative MRD post induction chemotherapy. However, among intermediate 7.1% (3/42)and in high-risk patients60% (3/5), had positive MRD post completion of induction chemotherapy. In high risk group, 2/3rd ph positive patients had positive MRD post induction by flow-cytometry though all of them had negative BCR/ABL byRT PCR. These patients received Imatinib from Day 15 of Induction. One patient who had poor steroid response had positive MRD post induction chemotherapy.

POST MRD ANALYSIS

Table 5: MRD value of different risk group post completion of induction chemotherapy

Risk*	Number	MRD<0.01%	MRD=>0.01%
Standard risk	21(29.4%)	20	1
Intermediate	42(58.8%)	39	3
High risk**	5(11.7%)	2	3
Total	68(100)	61	7

*Risk stratification based on D8 steroid response.

Interpretations of results: In univariate analysis, there was no significant association betweenMRD results and type of leukemia i.e. B and T cell ALL (P=0.58). We also found no significant association between cytogenetic (p=0.13) and aberrant markers (P=0.500) with MRD.

Ageand presenting counts were not significantly associated with level of minimal residual disease, (P= 0.22 for age, P=0.62 for presenting counts). However the odd ratio for age>10 years was 3.5, which suggest higher the age, more are the chances of getting MRD positive.

There was no significant association of Day 8 steroid response(P=0.103), but D15 marrow morphology (P=0.015) and risk groups (P=0.001) had statistically significant association with MRD level post induction.

Table 6: Summary of risk factors and their association with Minimal Residual Disease

Risk factors	Criteria	MRD -ve (<0.01%)	MRD +ve(=>0.01%)	P value
Gender	Male (44)	39	5	0.69
	Female(24)	22	2	
Age	<1yr or >6yrs(32	27	5	0.22
	)>1yr to <=6yrs(36)	34	2	
Phenotype	Pre B ALL	50	7	0.58
	T-ALL	11	0	
Presenting total leukocyte counts	<=20000 (44)	41	3	0.62
	>20000 (24)=	20	4	
D8 Prednisolone response	<1000blast/cu mm (67)	61	6	0.10
	>1000blast/cu mm(1)	0	1	
D15 Marrow morphology*	M1	46	5	0.015
	M2	0	1	
	M3	0	1	
D33 Marrow morphology	M1	61	6	0.10
	>=M2	0	1	
Standard risk	n=21	20	1	0.001
Intermediate risk	n=42	39	3	
High risk	n=5	2	3	
Aberrant marker	n=16	13	3	0.20
No aberrant marker	n=52	48	4	
Cytogenetics#	B ALL (54**)			0.13
	Normal(37)	33	4	
	t(12:21)(8)	7	1	
	t(1:19)(5)	5	0	
	t(9:22)(3)	2	1	
	MLL(1)	1	0	

#Cytogenetics done for only B cell ALL
*Records available for 53/68 patients
**Records available for 54/57 B cell ALL

DISCUSSION:

MRD is the best-known predictor of disease outcome1. MRD is a result of biological nature of blast and effectiveness of treatment regimen. Most of the treatment protocols include MRD as a guide for risk assessment and treatment plan. MRD can be doneby PCR or flow cytometry. PCR is not easily available in developing countries and flow-cytometry is widely available which is a valid technique to do MRD8. This retrospective analysis was done to see correlation of known risk factors and risk groups with MRD and to see if MRD can be avoided for risk stratification based on morphology.

ICBFM 2002 protocol which we followed is a non MRD based protocol. Mini risk protocol5 from same group which correlated MRD with known risk factors found that negative MRD at day 33 was associated with following factors - age of 1–5 years, WBC<20 000 ⊠l−1, non-T immunophenotype, good prednisone response and non-M3 morphology at day 15.

In another study9, NCI criteria i.e. age <1yr and >10years and TLC more than 50000/cumm has no association with level of MRD post induction which is in contradiction to what was found in above mentioned mini risk study.

In our study, we foundage more than six years was not statistically associated with positive MRD(P=0.22). When this association was checked with patients more than 10 years of age, the odd ratio was high (3.5). Presenting countswere also not associated significantly with MRD. This might be due to small sample size.

Day 8 steroid response is a strong predictor of treatment outcome and most new protocols take this criterion to risk stratifies patients7, 10. In our study, one patient with poor steroid response on D8 had positive MRD at the end of induction. D8 responsewas not significantly associated with MRD level, this may be due to small number of subject with poor response. With regards to day 15 marrow status, 5/51 patients with M1, 1/1 with M2 and 1/1 M3 status on day15 had positive MRD at the end of induction. D15 marrow morphology was significantly associated with MRD results (P=0.015). Though the sample size is small, it still has good correlation to MRD. This is in accordance with what has been described by mini risk study where M1 marrow on D15 had low MRD as compared to non M1 marrow.

We had only 3 patients with ph positive ALL which fall in the high risk category as per risk stratification. Post induction, all of them were negative for BCR-ABL by PCR though two had positive MRD by flow-cytometry. Again, in view of small numbers it is not feasible to consider them for statistical analysis.

In our cohort, value of MRD is statistically associated with various risk groups (p<.001).Only one child in standard risk group (4.7%) had positive MRD. This is in contrast to BFM study7 where they found 33% standard risk patients had positive MRD at day 33. This difference may be due to their larger cohort and relatively sensitive technique used by BFM group.

Three out of Forty two (7%) patients in the intermediate risk group had positive MRD thus need more intensive protocol to prevent possible relapse but if treated on morphology based criteria would receive lesser treatment .Thus it is difficult to avoid MRD in this subgroup as the plan of further treatment is different in MRD positive patients.

Two out of five patients (40%)in high-risk cohort become MRD negative post induction. Monitoring of MRD is essential for re risk stratification in this group to redefine therapy11,12.

Our study had a few limitations; first of all this was a retrospective study, done on a small sample of institutionalized patients with some having incomplete or missing data (especially Day 15 marrow morphology was not available for all children).Many intended associations of MRD with known factors could not be established. Hence findings of the study might have limited generalizability to a larger ALL patient population. However, considering scarcity of research in this area, our study does provide a one piece of evidence to support that MRD should be continued in ALL patients.

CONCLUSION:

Morphology-based ALL IC risk-group stratification allows the identification of high-risk patients, but statistically significant number need escalation of therapy based on their MRD. It can be concluded that it is not possible to avoid MRD for risk stratification and therapy institution.

REFERENCES:

1. Minimal residual disease–guided therapy in childhood acute lymphoblastic leukemia Blood. 2017 Apr 6; 129(14): 1913–1918. Prepublished online 2017 Feb 6. doi: 10.1182/blood-2016-12-725804

2. Minimal residual disease in acute lymphoblastic leukemia–SeminHematol. 2009 Jan; 46(1): 100106.doi: 10.1053/j.seminhematol.2008.09.001

3. Smith M, Arthur D, Camitta B, et al.: Uniform approach to risk classification and treatment assignment for children with acute lymphoblastic leukemia. J ClinOncol 14 (1): 18-24, 1996. [PUBMED Abstract]

4. ALL-BFM 95. Blood. 2008;111:4477-4489.doi.org/10.1182/blood-2007-09-112920

5. Intensive chemotherapy for childhood acute lymphoblastic leukemia: Results of randomized intercontinental trial ALL IC-BFM 2002, DOI: 10.1200/JCO.2013.48.6522 Journal of Clinical Oncology 32, no. 3 (January 20, 2014) 174-184.

6. Expression of aberrant antigens in hematological malignancies: A single center experience, Pak J Med Sci. 2018 Mar-Apr; 34(2): 457–462,doi: 10.12669/pjms.342.13996

7. Minimal residual disease (MRD) analysis in the non-MRD-based ALL IC-BFM 2002 protocol for childhood ALL: is it possible to avoid MRD testing?Leukemiavolume 22, pages989–997(2008)

8. Neale GAM, Coustan-Smith E, Stow P, Pan Q, Chen X, Pui CH, et al. Comparative analysis of flow cytometry and polymerase chain reaction for the detection of minimal residual disease in childhood acute lymphoblastic leukemia. Leukemia. 2004;18(5):934-938. doi: 10.1038/sj.leu.2403348

9. Minimal residual disease in childhood B Lymphoblastic Leukemia and its correlation with other risk factors. Pak J Med Sci. 2020 Jan; 36(1): S20–S26. doi:10.12669/pjms.36.ICON-Suppl.1721

10. European Review for Medical and Pharmacological Sciences 2018; 22: 7858-7866 J. GAO, W.-J. LIU Department of Pediatrics, Affiliated Hospital of Southwest Medical University, Prognostic value of the response to prednisone for children with acute lymphoblastic leukemia: a meta-analysis

11. Results of the AIEOP-BFM ALL 2000 Study for Childhood Acute Lymphoblastic Leukemia IN AIEOP High Risk Patients. Blood 114(22):319-319 · November 2009 DOI: 10.1182/blood.V114.22.319.319

12. Successful Therapy Reduction and Intensification for Childhood Acute Lymphoblastic Leukemia Based on Minimal Residual Disease Monitoring: Study ALL10 From the Dutch Childhood Oncology Group Rob Pieters, Hester de Groot-Kruseman, Vincent Van d.June 6, 2016. DOI: 10.1200/JCO.2015.64.6364

*Contributed equally

#Corresponding Author

1. Pediatric Oncology Unit, National Cancer Institute Nagpur India

2. Department of Pathology, National Cancer Institute Nagpur India
3. Department of Medical Oncology, National Cancer Institute Nagpur India

4. Department of Pathology, Homi Bhabha Cancer Hospital Varanasi Inda

MRD IN ACUTE LEUKEMIA REQUIRES HIGH DEGREE OF QUALITY ASSURANCE WHICH WE HAVE ACHIEVED AT NCI. WITH ACCURATE MRD MEASUREMENTS, WE CAN PERSONALIZE TREATMENT FOR EACH ACUTE -*LEUKEMIA PATIENT.*

Dr. Sameer Shrirangwar - Consultant Medical Oncologist, NCI

03 ORIGINAL STUDY - 2

A Study to Assess the Effectiveness of Structured Teaching Program on Knowledge Regarding Prevention of Breast Cancer and Cervical Cancer among Staff Nurses in National Cancer Institute, Nagpur

MS. PRIYANKA R. DHABARE, Nurse Educator- Department of Nursing
MS. PAYAL R. BURBURE, Nurse Educator- Department of Nursing

Dr. Satyam Satyarth
Ms. Kunjan Kulkarni

INTRODUCTION:

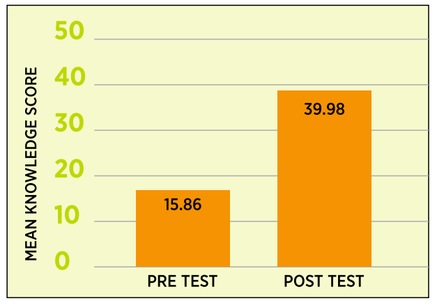
Breast and cervical cancers are the two most common women's cancers worldwide. Countries have invested for decades in early detection programs for breast and cervical cancer through screening, community education, and opportunistic case detection by health professionals. However, effectiveness in low- and middle-income countries has been limited due to low coverage, insufficient laboratory capacities for diagnosis, health information systems that are not designed to track patients or monitor program performance, barriers that inhibit women's uptake of services, and inadequate treatment options.

Aim: The aim of the study is to assess the effectiveness of structured teaching program on knowledge regarding prevention of breast cancer and cervical cancer among staff nurses in National Cancer Institute (NCI), Jamtha, Nagpur.

Objectives: The objectives of the study were to assess the pre-test knowledge regarding prevention of breast cancer and cervical cancer, to assess the effectiveness of structured teaching program on knowledge regarding prevention of breast cancer and cervical cancer, to assess the post-test knowledge regarding prevention of breast cancer and cervical cancer, and association of knowledge score with selected demographic variables.

Material and Method: The research design used in this study is experimental design. One-group pre-test post-test design is used; the samples were 150 staff nurses which fulfill the inclusion criteria. Setting of the study was NCI, Jamtha, Nagpur.

Conclusion: There was a significant increase in the knowledge of staff nurses after the introduction of structured teaching programme on knowledge regarding prevention of breast cancer and cervical cancer among staff nurses "t"-value was applied and "t"-value was calculated; post-test score was significant higher at 0.05 level than that of pre-test score. Thus, it was concluded that structured teaching program on prevention of breast cancer and cervical cancer was found effective. Hence, based on the above cited findings, it is clear that the structured teaching programme helped the staff nurses to improve their knowledge regarding prevention of breast cancer and cervical cancer.



Graph showing significance of difference between knowledge scores in pre- and post-test of staff nurses in relation to the prevention of breast cancer and cervical cancer

REFERENCES

1. Available from: https://doi.org/10.2147//IJWH.S197115 [Last accessed on 2021 Oct 15].

2. World Health Organization. WHO Guidance Note: Comprehensive Cervical Cancer Prevention and Control: A Healthier Future for Girls and Women. Geneva: World Health Organization; 2013. p. 2.

3. Polit DF, Beck CT. Nursing Research, Generating and Assessing Evidence for Nursing Practice. 9th ed. New Delhi: Wolters Kluwer Health; 2012. P. 94, 772, 58, 339.

4. Suresh KS. Nursing Research and Statistics. Harayana: Elsevier; 2011. p. 70-3, 30-4.

5. World Health Organization. Breast Cancer: Prevention and Control. Geneva: World Health Organization Publication on Cancer; 2013.

03 ORIGINAL STUDY -3

ANALYSIS OF DELAY IN INITIATION OF CHEMOTHERAPY AFTER ADMISSION TO DAY CARE UNIT OF TERTIARY CANCER INSTITUTE

Col (DR) RAVI SHANKAR RAMANI, General Manager Operations
MS. KUNJAN KULKARNI, Nursing Supervisor

Dr. Anand Pathak, MD
Dr. Prakash Kakani

INTRODUCTION:

Chemotherapy is an integral part of comprehensive cancer treatment. Cancer patients often experience delays in starting scheduled inpatient chemotherapy after admission in the day care centers. This compromises the quality, patient satisfaction and has a negative impact on reputation of the treating hospital.

The advantages of day care chemotherapy are compelling for the bulk of patients and the advantages of day care chemotherapy far outweighs the disadvantages. Day care chemotherapy centers are designed and equipped for patients who require short therapies or procedures that does not warrant over-night stay in the hospital. The advantages are [2] Drugs can be administered safely and easily Patients wish to avoid admission to hospital is respected. When not admitted overnight the patients feel safe and it strengthens their physical and psychological well-being. The treating Oncologist supervises and controls the administration of chemotherapy. Hospitalization expenses and overnight stay can be avoided. Chemotherapy is administered at patient's convenience.

Patients & Methodology: A survey of those patients admitted for elective chemotherapy was conducted for three months from 01 Jan 2021 to 31 Mar 2021 in day care chemotherapy units in National Cancer Institute, Nagpur. Time taken for various processes from the time of patient's arrival in the ward till the time of initiation of chemotherapy was noted. The difference in time between processes was analyzed. Cancer; 2013.

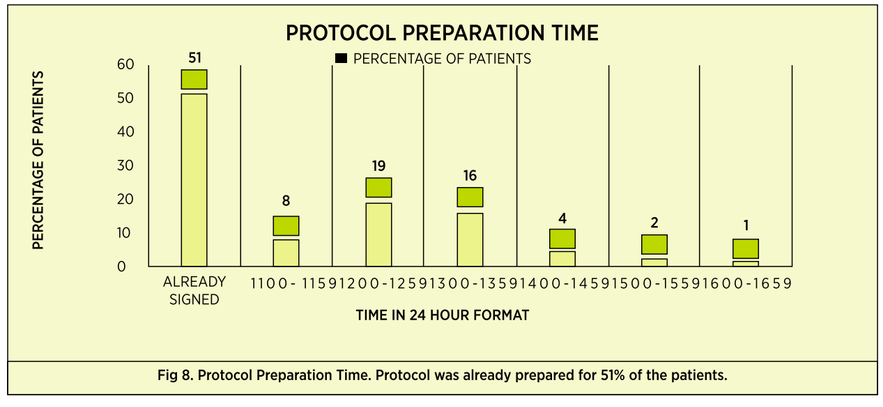


Fig 8. Protocol Preparation Time. Protocol was already prepared for 51% of the patients.

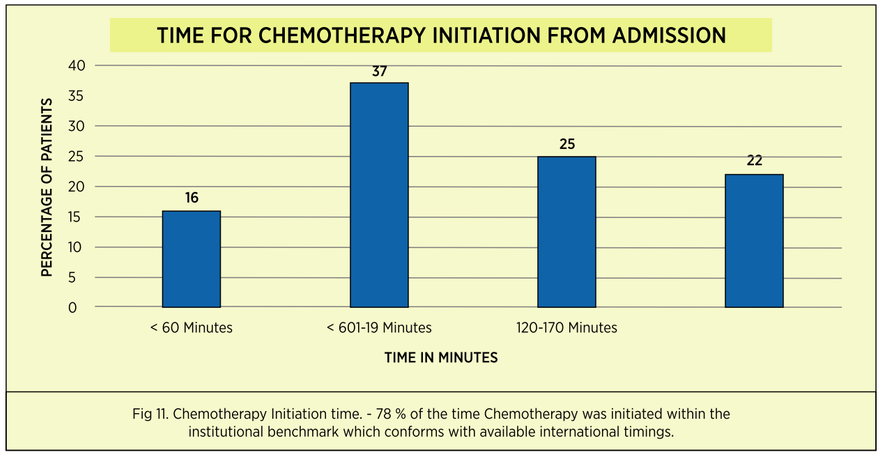


Fig 11. Chemotherapy Initiation time. - 78 % of the time Chemotherapy was initiated within the institutional benchmark which conforms with available international timings.

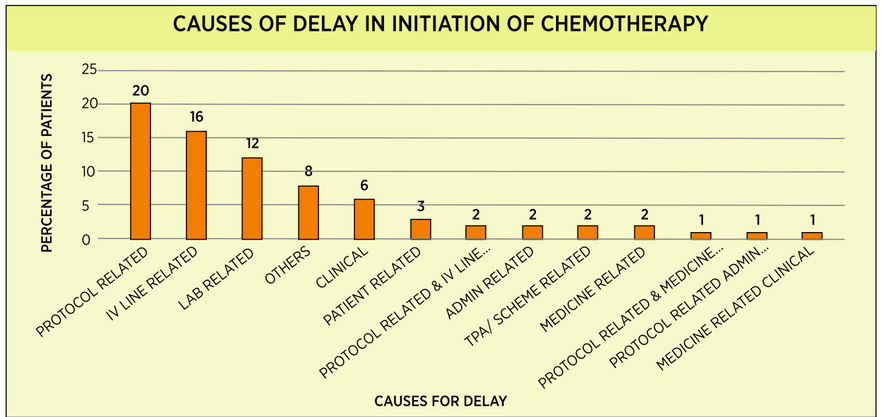


Fig 12. Common causes for delay in Initiation of Chemotherapy. Most common Cause of delay was related to protocol preparation and signing followed by establishment of intravenous access.

Dental OPD

Dental Services have commissioned in basement 2 with one dental chair and a full time dental specialist. It has become a busy service immediately. We plan to expand it in near future on the opd floor next to head neck DMG.

BLOG

Dr. Prakash Kakani, Medical Superintendent, NCI

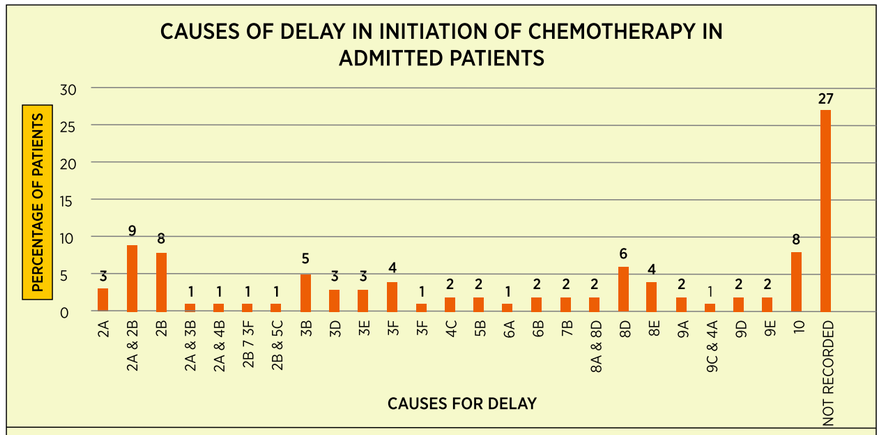


Fig 13. Common Causes for Delay in Initiation of Chemotherapy. Out of 110 recorded delays (More than 3 hrs. of delay), Causes were recorded in 80 patients. The numbers assigned are various reasons related to the causes of delay (Table 2)

Table 1: Benchmark- Institutional Standard Reference Time for Various Processes in Chemotherapy administration

Process Time	Benchmark - Institutional Reference Time (in minutes)
Time between admission and finalization of lab reports.	Within 60 minutes after admission
Time between admission and preparation of chemo protocol	Within 45 minutes after admission
Time between protocol preparation and pharmacy indenting	Within 15 minutes after preparation of protocol
Time between pharmacy indenting and arrival of drugs	Within 45 minutes after indenting
Time between arrival of drugs and initiation of chemotherapy	Within 15 minutes after receiving the drugs from pharmacy
Total time from Admission to hospital and initiation of chemotherapy	Within 180 minutes after admission to day care ward

Table 3: Chemotherapy Infusion Duration

Sample Size	476
Mean	4 hrs, 19 mins
Median	3 hrs, 30 mins
Mode	2 hrs
Standard Deviation	2 hrs, 28 mins
Minimum	20 mins
Maximum	12 hrs, 50 mins
Range	12 hrs, 30 mins

Table 2: Causes for Delay in Initiation of Chemoterapy

Assigned Number	Causes for Delay	Related Reasons
1	Nurses Related	a. Bed not Prepared b. Nurse busy with an emergency / another Patient
2	Protocol related	a. Not prepared b. Not Signed c. Wrong Protocal
3	IV Line related	a. Waiting for anesthetist / Surgeon b. Difficult to get IV line c. PICC/Chemo port/Central line dressing d. PICC Line insertion e. Chemo port insertion f. Central line insertion
4	Medicine Related	a. Delay in indenting b. Delay in supply c. Medicines Not Available
5	Admin Related	a. Patient Care Attendant (PCA) Not Available b. Waiting for old documents from Medical Records Department (MRD) c. Consent not obtained
6	Patient Related	a. Patient Not on Bed b. Patient having meals
7	TPA/SCHEME related	a. MJPJY / PMJAY (state / Central Govt Schemes) b. MPKAY / Departmental Scheme) C. CGHS (Central Govt Employees Scheme)
8	Lab Related	a. Abnormal CBC b. Abnormal Creatinine C. Abnormal SGOT/SGPT d. Reports not made ready e. Reports Not Available
9	Clinical	a. High BP b. Low BP C. Low RBS d. High RBS e. Vitals not stable
10	Others (Specify)	Any other reason not covered in the above list

Table 4: Descriptive Statistics of Time Measures of various Processes in Chemotherapy. This is compared with Institutional Benchmark.

Statistic	Time between admission and finalization of lab reports	Time between admission and preparation of chemo protocol	Time between Protocol preparation and pharmacy indenting	Time between Pharmacy indenting and arrival of drugs	Time between arrival of drugs and initiation of chemotherapy	Time between admission to hospital and initiation of chemotherapy
Sample Size	97	244	492	495	483	500
Institutional Benchmark	1hr	45 mins	15 mins	45 mins	15 mins	3 hrs
Mean	1 hr & 34 mins	1 hr & 25 mins	45 mins	45 mins	44 mins	2 hr & 11 mins
Median	1 hr & 29 mins	1 hr & 17 mins	22 mins	43mins	20 mins	1 hr & 52 mins
Standart Deviation	50 mins	1 hr & 3 mins	53 mins	25 mins	1 hr & 8 mins	1 hr & 25 mins
Minimum	8 mins	1 mins	0 mins	0 mins	2 mins	10 mins
Maximun	5 hrs & 9 mins	5 hrs & 30 mins	6 hrs & 10 mins	3 hrs & 52 mins	13 hrs & 30 mins	14 hrs & 10 mins
Range	5 hrs & 1 mins	5 hrs & 29 mins	6 hrs & 10 mins	3 hrs & 52 mins	13 hrs & 28 mins	14 hrs

Table 5: Benchmark- Institutional Standard Reference Time for Various Processes in Chemotherapy administration

Process Time	Benchmark	Average	Min	Max
Time between admission and finalization of lab reports.	1 hr	1 hr, 34 mins	8 mins	5 hrs, 9 mins
Time between admission and preparation of chemo protocol	45 mins	1 hr, 25 mins	1 min	5 hrs, 30 mins
Time between protocol preparation and pharmacy indenting	15 mins	45 mins	0 min	6 hrs, 10 mins
Time between pharmacy indenting and arrival of drugs	45 mins	46 mins	0 min	3 hrs, 52 mins
Time between arrival of drugs and initiation of chemotherapy	15 mins	44 mins	2mins	13 hrs, 30 mins
Total time from admission to hospital and initiation of chemotherapy	3 hrs	2 hrs, 11 mins	10 mins	14 hr, 10 mins

Findings: 16% of the chemotherapy were started within one hour of admission, 37% within 2 hrs, 25% within 3 hrs., and 22% chemotherapy was initiated after 3 hrs. of admission. 78% of the chemotherapy in the institute was started within the institutional benchmark of 3 hrs.

Recommendations: -

The following lean methods will help in reducing the time taken to initiate chemotherapy after admission to day care centre.

· Establishing a satellite lab near the day-care centre to improve TAT.

· Finalization of protocol before scheduling patients, authorizing the Registrars to initiate chemotherapy based on oncologists notes and advice.

· Discouraging unscheduled chemotherapy.

· Dedicated indenting nurse.

· Dedicated chemo drugs dispensing team in central drug store / pharmacy will ensure fast and safe dispensing of medicines.

· Adequate stocking of relevant chemo and adjuvant drugs, having them as ward stock and replenishing them as and when they get expended.

· Dedicated chemo drug administration nurse or pharmacist.

· Dedicated Chemo-Officer, preferably an oncologist to be in-charge for all the protocolized chemotherapies of the day.

These recommendations can be of immense benefit in an institutional setup and can avoid delays and dissatisfactions.

CONCLUSION: Reducing waiting time between patient admission and initiation of chemotherapy is a big challenge in any cancer institute due to involvement of multiple processes, departments, and people. It directly affects operations, bed occupancy and turnaround time in day-care center, and ultimately patient satisfaction. Identifying the causes for delay and application of lean techniques will optimize the time taken for initiation of chemotherapy and improve patient satisfaction.

REFERENCES-

1. ALouise Man, Jeremy Sen et al., "A Multidisciplinary Effort to Decrease Time from Admission to Chemotherapy on an Inpatient Oncology Unit" Blood, Volu. 130 (Supl 1), 2017, pp. 2129.

2. Dollinger M, "Guidelines for hospitalization for chemotherapy" Oncologist, Volu. 1(1&2), 1996, pp. 107-111.

3. Waqas Masood, "Clinical audit to assess delays in chemotherapy administration at day care oncology center at a tertiary care hospital in Karachi, Pakistan" Archives in Cancer Research, Volu. 6, 2018, pp. 65.

4. Broderick A, Mori M, Nettleman MD, Streed SA, Wenzel RP, "Nosocomial infections: validation of surveillance and computer modeling to identify patients at risk" American Journal of Epidemiology, Volu. 131(4), 1990, pp. 734–742.

5. Alabdulkarim, "Improving the operations performance of a chemotherapy clinic: a two-phase approach" South African Journal of Industrial Engineering, Volu. 29(4), 2018, pp 45-52.

6. Gupta A, Li J, Taw[illegible]k B, et al., "Reducing wait time between admission and chemotherapy initiation", Journal of Oncology Practice, Volu. 14, 2018, pp. e316-e323.

7. Hanan J. Aboumatar, MD, MPH, et al., "No Time to Waste: Decreasing Patient Wait Times for Chemotherapy Administration Using Automated Prioritization in an Oncology Pharmacy System" The American Journal of Managed Care, Volu. 14 (5), 2008, pp. 309-316.

8. Coates A, Abraham S, Kaye SB, et al., "On the receiving end: patient perception of the side effects of cancer chemotherapy" European Journal of Clinical Oncology, Volu. 19(2), 1983, pp. 203-208.

9. Bredart A, Razavi D, Delvaux N, Goodman V, Farvacques C, VanHeer C, "A comprehensive assessment of satisfaction with care for cancer patients" Support Care Cancer, Volu. 6, 1998, pp. 518-523.

10. Gourdji I, McVey L, Loiselle C, "Patients' satisfaction and importance ratings of quality in an outpatient oncology center" Journal of Nursing Care Quality, Volu. 18(1), 2003, pp. 43-55

REHABILITATION UPDATES

DR PRADNYA PATHAK, HoD
DR MANJUSHA HINGE
Department of Rehabilitation

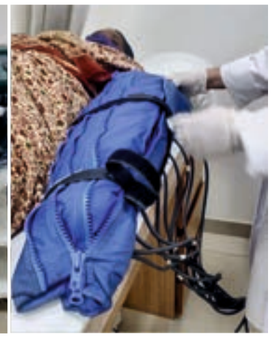
"Cancer has not put me on my Knees; it has put me back on my feet's"

We as a rehabilitation department are working towards this goal, where we combinedly putting efforts in improving the quality of life during and post treatment.

Recently in our department we introduced lymphapress machine which is effective in reducing post mastectomy lymphedema in upper limb and post lymph node dissection in gynaecological cancer in lower limbs.

Recently Gargee Rai (Consulting Dietician) has got IAPEN quality awards in AIIMS Delhi for excellence in medical nutrition therapy she is also the part of nutritional guidelines consensus for South Asian countries.

We also have a full fledged dental unit which is fully functional and beneficial for patient during Radiation.



Immmunohistochemistry Facility at NCI

Pathology forms the backbone of cancer diagnosis and with state of immunohistochemistry platform at NCI, we are able to give precise cancer diagnosis enabling the oncologists to treat patients successfully.

BLOG

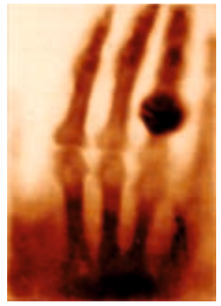
Dr. Meena Pangarkar, Head department of Laboratory, NCI

150 YEARS AFTER THE BIRTH OF MARIE CURIE, WHERE ARE WE IN RADIATION ONCOLOGY?

EXCERPTS, FROM AN ARTICLE

DR MANISH MATHANKAR
Consultant Department of Radiation Oncology

Madam Marie Curie



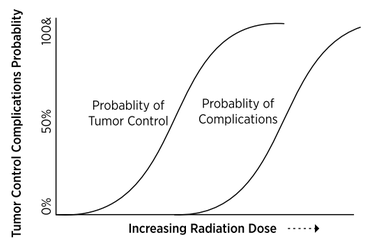
Madam Marie Curie

Maria Salomea Skłodowska born on 7 November 1867 in Warsaw, Poland. Marie Curie later went on to discover both polonium and radium, and won two Nobel prizes for her work on radioactive substances. The use of ionizing radiation for the treatment of cancer dates back to the late 19th century, soon after the discovery of X rays by Wilhelm Conrad Roentgen in 1895 and the use of brachytherapy after Marie and Pierre Curie discovered radium in 1898.

The very earliest X-ray treatments were for benign conditions like eczema and lupus. Treatment of Gastric cancer with Radiotherapy was reported in scientific journal in 1896, by 1902-1904 Radium tubes were used for treatment of pharyngeal cancer by implanting tubes within Tumor as brachytherapy.

The field grew rapidly through the last years of the 19th century and into the first years of the 20th. Now almost 40 % of patients who are cured of cancer receive Radiotherapy and around 50 % of cancer patients will require Radiotherapy at some point during their treatment. Radiotherapy has a curative stake in sites like Brain, Nasopharynx, Oropharynx, Larynx, Esophagus, Lung, Pancreas,Rectum,Prostate,Bladder, Cervix, Vagina, Anal Canal etc., adjuvant role in Brain,Oral cavity, Breast, Stomach, Hepatobiliary, Genitourinary, Sarcomas , Leukemia etc and palliative role in almost all sites.

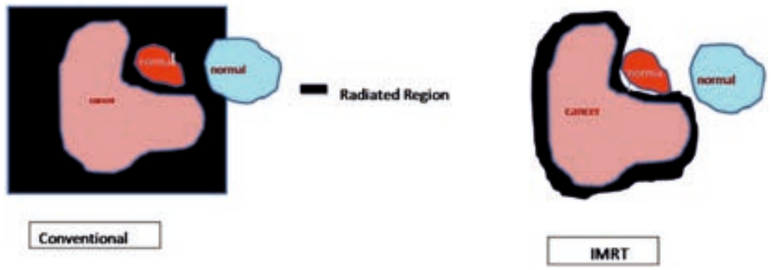
Over the last few decades Radiotherapy witnessed many evolutionary changes in terms of Clinical advances, Technological advances and biological advances. Radiotherapy comprises multiple different treatment modalities, including external beam therapy (encompassing photons, electrons, protons and other particles) and internal/surface treatment (brachytherapy and radiopharmaceuticals). The most widely used modality is megavoltage photon therapy, which is a form of high-energy electromagnetic radiation produced by a linear accelerator. The basic principle in Radiation treatment is to deliver maximum dose to the target to achieve maximum disease control and minimum dose to the surrounding normal tissue to minimize radiation induced toxicities.ctional and beneficial for patient during Radiation.



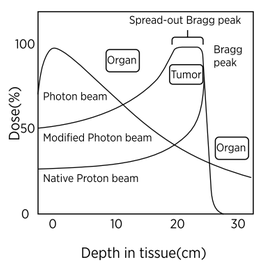
The above curve explains the concept on which most of the Radiation research work is going on. The ultimate aim of Radiotherapy Research is to shift the curve of Probability of Tumor Control towards left so that maximum Disease control can be achieved with minimum Radiotherapy dose and shifting the curve of Probability of Tissue complications towards right so that minimum toxicity can be achieved. These can be done by following:

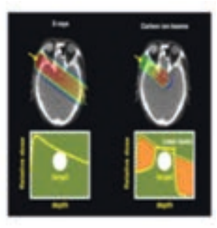
TECHNOLOGICAL ADVANCES	BIOLOGICAL ADVANCES
IMRT, IGRT	Drug-RT Combinations
MRI LINAC	RT with immunotherapy
PROTON, CARBONION	Abscopal effect
FLASH RADIOTHERAPY	

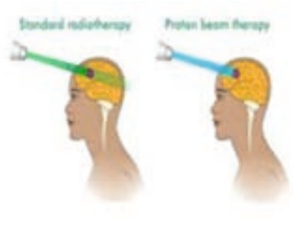
150 YEARS AFTER THE BIRTH OF MARIE CURIE, WHERE ARE WE IN RADIATION ONCOLOGY?



Less than two decades ago, RT was mostly given as simple fields, which are square/ rectangular beams with minimal image guidance as shown in above figure (Conventional). So along with tumor tissue, surrounding normal tissue used to receive high RT doses leading to higher toxicities. With the development of Intensity Modulated Radiation Therapy (IMRT), radiation fields are conformed to the target shape and size leading to reduced dose to surrounding normal tissue which enabled a radiation oncologist to deliver higher doses to the target region. Image guidance (IGRT) helps us to monitor the movements of tumor tissue as well as surrounding normal tissue during the Radiotherapy treatment (interfraction and intrafraction). Technological development enables us to develop another new treatment technique Stereotactic Body Radiation Therapy (SBRT) and Stereotactic Radiosurgery (SRS) which allows administration of very high doses in a small number of fractions (SBRT) or single fraction (SRS) respectively. Emergence of Proton therapy, with minimal exit dose beyond the target has revolutionized the field especially in pediatric and skull base tumors. The gross difference between Proton therapy and Photon therapy in achieving dose distribution is explained in following figure :

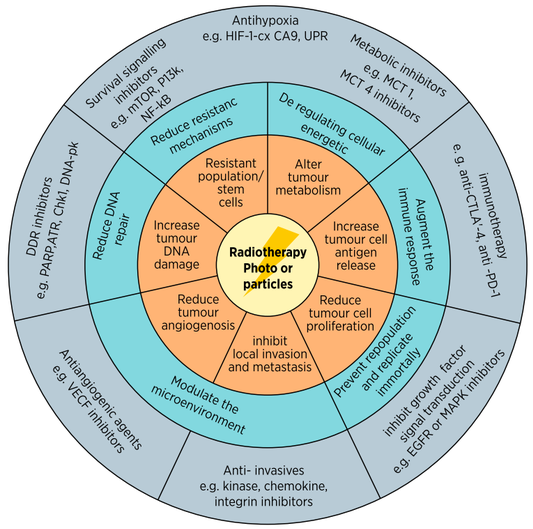






Use of various novel chemotherapy, immunotherapy, targeted agents along with Radiotherapy has opened new horizons in the field of Radiotherapy as briefly explained in above figure eg. Radiotherapy in combination of DNA damage response inhibitors etc.

Thus the advances in technological, biological and clinical front in the field of Radiotherapy has made this branch more promising in the near future.



REFERERRENCE:

Practice-changing radiation therapy trials for the treatment of cancer: where are we 150 years after the birth of Marie Curie?

Mareike K. Thompson1, Philip Poortmans2, Anthony J. Chalmers3, Corinne Faivre-Finn4, Emma Hall5, Robert A. Huddart6,

Yolande Lievens7, David Sebag-Montefiore8 and Charlotte E. Coles9

British Journal of Cancer (2018) 119:389–407; https://doi.org/10.1038/s41416-018-0201-z

Images used from google for academic purpose only.

Pharmacy Expansion

Looking at the growing pharmacy needs of patients at NCI, we decided to construct a large size outdoor pharmacy near the main entrance including a convenience store for the day to day needs of patients and their relatives. Both were commissioned at the hands of Honorable *Shri Devendra Fadnavis*, Leader of Opposition Maharashtra state. There has been immense response to these facilities from the patients.

BLOG

Shailesh Joglekar, General Secretary & CEO, NCI

04 WRITE UP - 3

IAEA/WHO/SSDL-BARC TLD (RPLD) POSTAL DOSE QUALITY AUDIT FOR MEGAVOLTAGE X-RAY BEAMS OF MEDICAL LINEAR ACCELERATORS

MR. HEMANT GHARE
Chief Medical Physicist & Radiation Safety Officer L-III

IMPORTANCE OF POSTAL DOSE QUALITY AUDIT IN RADIOTHERAPY:

In Radiotherapy maximum control of tumours with minimum of complications to the normal tissues depends on various factors especially on the accuracy of absorbed dose.

For the accurate delivery of prescribed dose to the patients, high precision and accuracy in radiation dosimetry is required. The medical physicist is responsible for the accurate delivery of whole planned radiation doses to the patients prescribed by the radiation oncologist.

The proper delivery of radiation doses depends upon the accurate output measurements of radiation doses from the therapy machines.

The aim of the postal dose quality audit program based on the thermo-luminescence dosimeter (TLD)/ Radiophotoluminescent Dosimeter (RPLD) is to investigate and reduce uncertainties involved in this output measurement (measurement of absorbed dose) and to improve the accuracy of dose measurement in the radiotherapy centre which will assure proper calibration of radiotherapy beams to avoid mistreatment of cancer patients and prevent radiation accidents

Since 1969, The International Atomic Energy Agency (IAEA) and the World Health Organisation (WHO) operate the IAEA/WHO TLD postal dose audit programme.

Thermoluminescence dosimeters (TLDs)/RadiophotoluminescentDosimeter (RPLDs) are used as transfer dosimeters and the evaluation of these are done at the IAEA Dosimetry Laboratory.

Originally the TLD (thermo-luminescent dosimetry) service was developed for Co-60 therapy units, and since 1991 it provides audits of high-energy photon beams produced in Medical Linear accelerators. The TLD/RPLD service also monitors activities of Secondary Standards Dosimetry Laboratories (SSDLs) in radiotherapy since 1981, and it has recently been extended to auditing radiation protection standardization in SSDLsI the time of initiation of chemotherapy was noted. The difference in time between processes was analyzed. Cancer; 2013.

PRINCIPLES OF OPERATION OF THE IAEA/WHO TLD POSTAL DOSE AUDIT SERVICE FOR RADIOTHERAPY CENTRES:

The service is cost free to participants. It spot checks the calibration of clinical teletherapy photon beams (Co-60 and megavoltage beams from accelerators). It does not check Electron beams, Brachytherapy, Orthovoltage x ray beams, stereotactic radio-surgery equipment such as Gamma-knife, X-ray knife, Cyber-knife, Stereotactic Gamma System, or similar.

- The hospital can request the number of TLD/RPLD sets corresponding to the number of clinical photon beams used for teletherapy; however, not more than three beams will be checked in an irradiation run (irradiation window).
- The TLD/RPLD results are sent to the participants within 8 weeks of receiving the irradiated TLDs/RPLDs at the IAEA, depending on the queue for the TLD reader. The participants receive individual result certificates for each beam checked with TLDs/RPLDs. Results within a 5% limit are considered acceptable.
- If the results are within the acceptance limit of 5%, the next participation is recommended after two years.
- Institutions with results outside the 5% acceptance limit are provided with a second, follow-up TLD/RPLD for immediate repeat irradiation. If the second TLD/RPLD result is still not acceptable, an expert visit is recommended to resolve the discrepancy, and the next participation is recommended for one year later.
- The results of TLD/RPLD audits are kept confidential by the IAEA/WHO (PAHO) staff and the national TLD coordinators.

Individual requests (outside the irradiation windows) are accepted for new installations, following major repair of the treatment units, Co-60 source replacements, unusual patient skin reactions, and for other important reasons. Such requests can be made at any time and will be given the highest priority

The service for hospitals is carried out through collaboration between the IAEA and the World Health Organization (WHO). The IAEA's Dosimetry and Medical Radiation Physics Section is responsible for the technical aspects of the service and WHO (or PAHO) assists of the mailing and distribution of the TLD/RPLD capsules to radiotherapy hospitals.

The IAEA/WHO TLD service receives the support of the BIPM, Primary Standard Dosimetry Laboratories, and some advanced radiotherapy centres. These institutes provide reference irradiations of TLDs, acting as an external quality control of the service

As of 2017 Dosimetry Laboratory, IAEA is using a newtype of the DOSIMETER For the Dosimetryaudit (Fig.1). The Radiophotoluminescent Dosimeter (RPLD) isreplacing the Thermoluminescent Dosimeter (TLD) for DOSEAUDITS. The new system is based on radiophotoluminescence dosimetry and will use glass dosimeters in the form of small rods (Fig.2) Glass rods are 12 mm long. They have unique identification numbers (ID) engraved at one end of the rod. The centre of the active volume is marked on the RPLD capsule with a dot.

Figure 1. RPLD Dosimeter

Figure 2.Radiophotoluminescent dosimeters (RPLDs) – glass rods

The irradiation procedure for RPLDs is essentially the same as for TLDs; The RPLDs are reusable dosimeters that need to be kept in their protective capsules at all times. They represent a significant investment. Therefore, it is crucially important to handle RPLDs with care and make all efforts to return them safely to the IAEA Dosimetry Laboratory.

PARTICIPATION OF NATIONAL CANCER INSTITUTE IN THIS POSTAL DOSE QUALITY AUDIT:

In National Cancer Institute, Department of Radiation Oncologyhave two high energy medical Linear Accelerators,

1) linear accelerator Model TrueBEAM (with 6MV,10MV & 15 MV X-Ray photon energies, 6FFF & 10FFF high dose rate FFF X-Ray photon energies and 6 different energies of Electrons)
1) linear accelerator Model CLINAC iX(with 6MV & 15 MV X-Ray photon energies, 6FFF high dose rate FFF X-Ray photon energy and 6 different energies of Electrons)

Department of Radiation Oncology participated in this Audit for the irradiation Window 5-20 **December2018** and 14-31 **December 2019.**

For these audits our National Coordinator was Radiation Standards Section, Radiation Safety Systems Division, Bhabha Atomic Research Centre, Trombay, and Mumbai.

The department received the package containing, DOSIMETER SET with Identification numbers, Data Sheet(s), Instruction Sheet, and USB with the TLD irradiation tutorial video (also applicable for RPLDs), to guide the irradiation process and data reporting.

THE IRRADIATION PROCEDURE FOR RPLDCAPSULES:

A special type of holder feasible to set with the IAEA standard phantom size of 30×30×30cm^3 and some water tank made of Perspex sheath was used in this audit. The RPLD capsules were irradiated at 10 cm depth in water using a field10 cm × 10 cmat a distance100 cmSSD fixed source skin distance. The dose for irradiation is fixed at 2 Gy of absorbed dose to waterbecause this value is approximately equal dose to the patient at each fractionation of treatment.

PREPARATION OF THE HOLDER, WATER PHANTOM AND THERAPY UNIT:

- Assembled the holder as shown in Fig.3
- Placed the holder in a water tank on the treatment table as shown in Fig. 4
- Set therapy unit for a vertical beam, with a 10 cm x 10 cm field size (Fig. 4).
- Aligned the holder tube with the central axis of the beam (Fig.4).
- Adjusted the water level by filling the water tank exactlyto the level of the top of the holder (Fig. 4). We made it sure that the tube of the holder is also filled with water.
- Adjusted the table height so that the water surface is at usual distance to the source

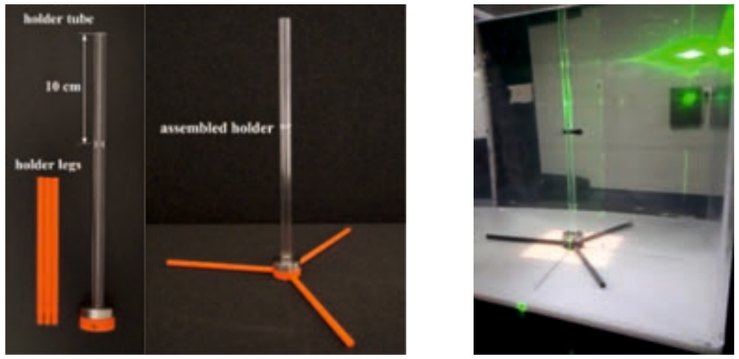


Figure 3. Assembling the IAEA standard holder for the RPLD irradiations

SSD set-up
The RPLD Capsule is at a cm depth.

OR

Isocentric set-up
The RPLD capsule is Positioned at your usual SAD.

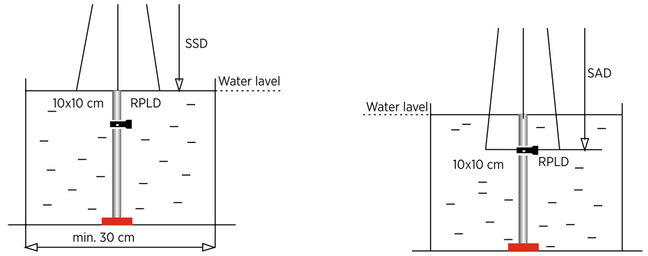


Figure 4. Two alternative geometry set-ups for the RPLD irradiation.

As per the instructionsRPLD capsule with a blue plug was not irradiated; as it is used to record environmental influences during transport and storage.

The number of monitor units to deliver 2 Gy (200 cGy) to a 'tumour' whose centre (the RPLD capsule) is at 10 cm depth was calculated from our Eclipse Treatment Planning System.

We followed below mentioned steps,

1) Before irradiation recheck whether The Alignment, field size, water level and distance are correct
2) Insert the capsule into the hole of the holder so that the dot on the capsule is positioned in the centre of the tube (Fig. 5).
3) Irradiate the RPLD capsule with the number of monitor units calculated above.
4) Remove the capsule from the holder (Fig.5.) and wipe it dry.
5) Repeat the procedure, steps 2 to 4, for the second capsule, (total 2 RPLD capsules per beam).

DETERMINATION OF THE ABSORBED DOSE TO WATER BY IONISATION CHAMBER:

The absorbed dose to water at the centre of the RPLD capsule was determined using a dosimeter systemconsisting SNC600C, 0.6cc ion chamber and Sun Nuclear PC Electrometer

The Co-60 calibration coefficient of the dosimetry system (ionization chamber together with electrometer)

$ND_{,w}$ (absorbed dose to water calibration coefficient) was used

The absorbed dose to water at the position of the centre of the RPLD capsule was measured under the following conditions:

30x30x30 water phantom

Field size 10 cm x10 cm

SSD 100 cm

10 cm depth of the geometrical centre of the ionisation chamber in phantom

The absorbed dose to water at the position of the centre of the RPLD capsule was determined by the TRS-398 protocol

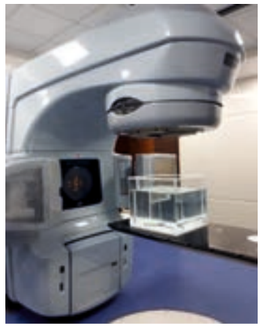


Figure 5. Inserting, positioning and removing the RPLD capsule

Figure 6. TrueBeam linear Accelerator

Figure 7. Team of Medical Physicist of NCI with setup for RPLD irradiation

REPORTING OF RPLD IRRADIATION AND ABSORBED DOSE TO WATER DETERMINATION THROUGH DATA SHEETS:

The electronic data sheets (PDF forms) wereneed to be filled with our address details, RPLD Batch No., RPLD SET No., Specifications of the irradiation unit, details of Irradiation of RPLD capsules, data used for the calculation of time/monitor setting for the RPLD irradiation, details of the irradiation conditions for which the clinical beam output applies, details for determination of the absorbed dose to water by ionisation chamber.After filling out the form; we VALIDATED our data (using the button on the last page)

These data sheets were returned to the IAEA and dosimeter sets to the National Dosimetry Audit Coordinator and also e-mailed a SOFTCOPY of our filled-out data sheets (PDF forms) to Dosimetry and Medical Radiation Physics Section (DMRP) Division of Human Health, IAEA with cc: to the National Dosimetry Audit Coordinator. To improve the accuracy of our results we irradiated and sent the RPLDs within given time period.

RESULTS OF POSTAL DOSE QUALITY AUDIT:

After evaluation of our RPLDswe received the results of the audit (in the form of a certificate) via email, from Dosimetry Laboratory, Dosimetry and Medical Radiation Physics Section (DMRP), Division of Human Health, IAEA, Vienna International Centre, Vienna Austria.

Our dosimetry audit results were within IAEA's 5% acceptance limit and no further action was required on our part.

The TLD inter comparison study has been made it possible to test the consistency and accuracy of mega voltage X-ray beams of our both high energy Linear Accelerators TrueBeam & Clinac iX at our radiotherapy centre.

Our participation in this Postal Dose Quality Auditassured that the radiation doses delivered to the patient is the same as the prescribed dose with high accuracy.

It has given confidence in the basic of clinical delivery of dose in radiotherapy treatment and consistency of dosimetry at our radiotherapy centre.

CONCLUSION:

Independent dosimetry audits play an important role in patient treatment quality, radiation protection and safety. Audits have the potential to identify issues and resolve them, reducing the probability of harmful errors to occur. They also support the safe implementation of new techniques and technologies, and promote knowledge sharing at a national and/or international level by benchmarking centres with similar equipment.

The IAEA stresses the importance of every radiotherapy centre equipped with new machines and those that are going to introduce new treatment techniques in clinical practice, participate in dosimetry audits before starting treating patients, and regularly after that.

Moreover, a recent European Directive (2013/59 Euratom) recommends that new radiological procedures should be audited. Independent dose audits are also mandatory in many multi-institutional clinical trials in radiotherapy to ensure that participants deliver accurate doses and so the reported results are not biased.

Below are the Certificates showing Results of our participation in audit run, Batch #300 received from Dosimetry Laboratory, IAEA Lab Seibersdorf, Friedenstrasse 1, A-2444 Seibersdorf, and Vienna Austria.

04 WRITE UP - 4

Depression in Cancer: A double trouble

DR ABHIJEET FAYE
Consultant - Department of Psycho oncology

'Cancer', the word itself, induces fear in a person who hears it for himself or for near ones. The diagnosis of cancer is significantly stressful for most of the people and is associated with emotional disturbances. The most common among these are sadness and anxiety. Certain amount of sadness and worries due to uncertainty about the outcome, long duration of treatment, adverse consequences associated with treatment (chemotherapy and radiotherapy), fear of cancer recurrence, etc is common. But when this sadness is associated with difficulty in maintaining the routine, reduced interest in previously pleasurable activities, lack of motivation for anything, death wishes and social/occupational dysfunction, it becomes problematic. These symptoms are suggestive of **'depression'** which is a common occurrence in patients & caregivers of cancer and can be the matter of concern. Depression can be mild and temporary, but can be severe and long lasting. The severe type is called as **'Major depression'** or **'Clinical depression'**.he time of initiation of chemotherapy was noted. The difference in time between processes was analyzed. Cancer; 2013.

Emotional disturbances occur in almost every patient of cancer and their caregivers but significant mental health problems are present in around 50% of the cancer patients. Anxiety, depression, panic attacks, acute stress reaction, adjustment disorders are among the common disorders. Depression usually occurs in about 1 in 4 people with cancer. Prevalence rangesfrom 15 to 25 percent of people with cancer, a rate two to three times higher than that in general population. Minor or major depression in cancer increases the mortality rate by up to 39%. Prevalence of depression in palliative care wards have been documented as up to 50%.

Though Depression can occur with any cancer, it is most common in pancreatic and lung cancers. Age also influences the occurrence. Children and adolescents with cancer are less depressed compared to adults. Gender-wise differences are also found; in some cancers, females are found to be 2-3 times more likely to experience depression compared to males. Severity of depression also varies across the course of a disease and it is highest around the time of diagnosis. Metastases (distant spread) and cancer pain have been associated with higher level of depression.

Following are some signs and symptoms of depression that can help in identifying the depression.

- Sadness of mood almost every day for most of the day
- Loss of interest or pleasure in activities that were enjoyable before
- Major weight loss (even when not dieting) or weight gain
- Sleep changes (late onset sleep, inability to sleep, early waking, or oversleeping)
- Extreme fatigability or less energy almost every day
- Other people notice the restlessness or "slowed down state" almost every day
- Feelings of guilt, hopelessness, worthlessness and helplessness
- Trouble focusing, remembering or making decisions
- Frequent thoughts of death or suicide or attempts of suicide
- Decreased interest in daily activities/routine
- Reduced motivation for doing anything
- Irritability

Depression can occur as a psychological reaction to the cancer diagnosis or treatment, directly due to tumour or metastasis in brain, as an adverse effect of medicines or just as an aggravation of pre-existing depression.

The risk is more if family support is poor, disease is advanced, history of depression present in past, with disfigurement or amputation surgeries, other significant stressors are already present and if there is a poor response to the treatment.

The **quality of life** is largely affected in cancer patients having depression. Bearing the suffering of cancer with depressed mind is very difficult and patient may find it impossible to bear the pain even for a day. Many patients lose hope in the process and life may seem difficult or worthless to live. Some may develop passive death wishes or active suicidal ideas. They also are preoccupied with guilt feeling about how their illness is affecting other family members, finances and overall life of their loved ones. Some also have crying spells with the thoughts of self blame and punishment they deserve for the bad deeds or sins they might have committed. The adverse affects of treatment or the usual somatic symptoms of cancer are felt in more severity by patients who have depression. If the suffering is more or the disease is advanced with poor prognosis, the symptoms of depression are more severe and persistent. Diagnosis is bit complex as some of the above symptoms may be considered normal to be present when patients have intense physical and psychological strain/pain. Patients may also struggle with other behavioural changes, including poor cognition (slowed thinking, delayed response, poor attention, difficulty remembering, difficulty in comprehending the things, etc) and social withdrawal.

Depression if present can lead to poor adherence to the treatment, poor response to the cancer treatment, reduced motivation to follow the doctor's advice along with directly or indirectly impairing the immunity of the patient. This all can result in increased hospital stay, high morbidity, more mortality and delayed recovery.

It is therefore necessary to assess, identify the depression and intervene as early as possible to prevent the adverse consequences. Patients as well as family members need to be aware about the appearance of depressive symptoms and should report the same to the treating doctor or the mental health professional at the earliest, as seeking help on time leads to a positive impact on patients' journey in fighting with cancer.

Mild depression can be easily resolved with counselling and psychotherapy. Moderate to severe cases require medicines with counselling and/or psychotherapy. Sometimes other specialized treatments (like Electro convulsive therapy) are also needed. These treatments improve the depression, reduce the suffering and help the person with cancer have a better quality of life.

GENERAL MEASURES FOR PATIENTS

Sharing - Talk about feelings and fears that you or family members have. It's fine to feel sad, angry, anxious or frustrated, but we can't just blow it on those close to us. It's important to listen each other carefully, support each other, encourage, respect each other's thoughts or opinions and don't blame self or others. Many a time the severity of negative emotions can be reduced by sharing, though we may not get exact solution to our problem. Writing down the feelings may also help. Any depressive symptom, if noticed should be shared with the treating doctor.

Seek help - from experts (oncologists or mental health professionals) or those you trust on.

Mindfulness, prayers & meditation - These help in keeping you calm, relaxed and maintain the positivity in thoughts. Regular 15 minutes meditation per day may be sufficient.

Regular exercise (as per the comfort level and capability) - This will help to boost the immunity and keep the mood happy. Recreational activities such as reading, painting, indoor games, watching motivational videos, etc. also help elevate the mood and keep the negative thoughts at a bay).

Living the hobbies - whenever possible, utilize the time in doing things you always wanted/liked to do. This helps in bringing a pleasure at least for some time.

Deep breathing exercises (breathing deeply & slowly in and exhaling even more slowly) and relaxation activities whenever possible (like closing the eyes, breathing deeply, focusing on each body part and relaxing it, starting from toes and progressively moving up to the head).

Be updated about the treatments options available for depression.

Never hesitate to consult a mental health professional as proper guidance and treatment is needed to cope or fight with the depression. This will help in preventing subsequent grave consequences.

GENERAL MEASURES FOR CARERS

Encourage/motivate the patient to talk about their fears and concerns whenever he/she feels like.

Listen carefully; showing interest and without judging the patient's feelings.

Avoid telling the person blankly to "cheer up" or "be positive."

Discuss together about what can be done to support each other.

Don't try to give reasons for patient's emotions (e.g. you think a lot, hence you are sad). Get help from someone among cancer care team.

Try to help patient get engaged in the activities they enjoy or help them to indulge in some creative/productive activities that may improve their mood.

One should keep in mind that caregivers can also get depressed. Above measures can be used for caregivers also.

Take care of yourself also. Taking time out, taking break from caring work and involving other family member to take care of patient is needed intermittently. Only one person taking care of cancer patient for long may cause a feeling of exhaustion and frustration.

Talk with other carers to know about how they are coping, what they are doing to keep their stress at lower level, etc. One may get different ideas and perspectives about stress free caring.

Parents of children with cancer need special attention and counselling as witnessing own child's suffering can be overwhelming to many parents and there is a high risk of depression in them. Identifying and treating them as early as possible may help in improved care of a child with cancer.

URGENT NEED OF PSYCHIATRIC CONSULTATION

When the patient has thoughts of self-harm or suicide, or he/she can't stop thinking about death.

When the patient behaves in such a way that family members are much concerned about his/her safety.

When patient can't eat or sleep and is persistently not interested in usual/routine activities for several days.

Patient is not taking adequate care of cancer treatment (compliance, dosing, precautions, follow ups, etc) affecting his/her recovery and prognosis of cancer.

Depression is preventable as well as treatable. One has to be aware of the signs and symptoms and the services available to fight against it. It is important to treat it simultaneously with cancer to ensure the smooth treatment and recovery in cancer.

LUTETIUM -177 –RADIOISOTOPE THERAPY; DAWN OF “THERANOSTICS” at NCI

DR CHAITALI BONGULWAR
Consultant - Department of Nuclear Medicine

“Theranostics” is the term used to describe the combination of using one radioactive drug to identify (diagnose) a disease and a second radioactive drug to deliver therapy to treat the main tumour and metastatic tumors.This is explored in varied cancers including neuroendocrine tumours and prostate cancer .NCI has started its therapeutic facility as phase I with use of high dose Lutetium -177 based radionuclidetherapy in prostate cancer and neuroendocrine tumours.Currently there are 5 patients who are receiving Lutetium -177 –PSMA therapy.The present article emphasis the in prostate cancer

Prostate-specific membrane antigen (PSMA) is expressed in most prostate cancers and can be identified by PSMA-ligand imaging using ^{68}Ga-PSMA or ^{18} F –PSMA PET /CT. PSMA-directed radioligand therapy (PSMA-RLT) with Lutetium-177 (^{177}Lu-PSMA) isa promising tool to treat metastatic castrate resistant prostate cancer .The therapeutic radiopharmaceutical consist of low molecular weight PSMA-ligands like PSMA-617 orPSMA-I&T radiolabelled with the beta minus particle emitter Lutetium -177(^{177}Lu).^{177}Lu is a β- and γ-emitting radionuclide with a physical half-life of 162 h (6.73days) .It has lower maximum and mean ⍁-particle energies (0.498 MeVand 0.133 MeV, respectively). These translate to maximum and mean soft-tissue penetration depths of 1.7 mm and 0.23 mm, respectively. ^{177}Lu has two main gamma emission lines-113 keV (6% relative abundance) and 208 keV (11 % relative abundance). The latter properties of ^{177}Lu allow post treatment imaging and dosimetry assessments.

Patients with metastatic, castration-resistant prostate cancers (mCRPC) who have exhausted or are ineligible for approvedalternative options and with adequate uptake of PSMAligandson the basis of a pre-therapy imaging study are considered eligible for treatment.Contraindications include individuals with a shorter lifeexpectancy of less than 6 months and with extreme renal dysfunction or myelosuppression . Relative contraindictaions which require timely interventions (radiation therapy, surgery), e.g. spinal cord compression and unstablefractures are also evaluated. The individual indication of PSMA-RLT is a decision of the multidisciplinary tumour board.The pretreatemnt work up include blood investigation and nuclear medicine scans for renal and salivary scans at every cycle.

We are using the Lutetium -177 –PSMA 617 supplied by BRIT .The procedure consists of a single day admission .I.V. or oral hydration as per individual cardiovascular and voiding conditions initiated before start of therapy. RLT is administered by slow I.V. injection of ^{177}Lu-PSMA in normal saline .7.4 GBq(at 6-8 week intervals for a total of four to six cycles. Prophylactic antiemetic therapy, cold compresses to salivary glands.

Subsequent follow-up consists of blood count, PSA, liver and kidney function tests at 2-3 weeks interval. Intra-therapeutic scintigraphy (0–3 days after treatment) confirms radiotracer localisation .Response assessment includes PSA and post-therapeutic emission scans at every cycle with cross-sectional imaging, preferably PSMA-ligand PET considered every 2 cycles .Repeat (PSMA-RLT)has been applied for a cumulative of up to seven cycles in recent observational studies without excess toxicity . Repeat therapy every 6 to 8 weeks allows for recovery of haematotoxicity in most cases

Side effects include dry mouth, transient nausea and fatigue. Grades 3–4 haematotoxicity occurred in less than 10% of patients. Data of several studies show a favourable safety profile for 177Lu-PSMA RLT.Patient is discharged from the ward after the dischargeable radiation exposure limits are as recommended by AERB arreached Radiation safety with regards to children and pregnant female,toilet hygiene is explained to the patient .

Biochemical response after repeat RLT, as defined by PSAdecline ≥ 50%, is expected in more than half of patients, andpartial response by imaging is expected in more than one-thirdof patients. Pain and quality oflife improved significantly in more than one half of patientswithin smaller observational trials.Many studies show prolonged PFS and OS, improved quality of life, and low treatment-related toxicities in patients treated with 177Lu-PSMA-617 radioligand therapyThus ,Lutetium -177-PSMA treatment serves asa promising tool in the management of prostate cancer patients .

THERANOSTICS IN CANCER IS A RAPIDLY EVOLVING CONCEPT IN CANCER THERAPEUTICS. THIS IS EXPECTED TO MANY CANCERS.

Dr. Kaushik Chatterjee
Sr. Consultant Nuclear Medicine Department, NCI

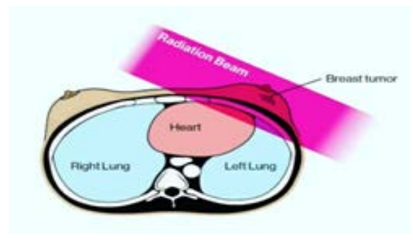
DIBH: A GIFT OF TECHNOLOGICAL ADVANCEMENT TO SPARE HEART IN LEFT SIDED BREAST CANCER PATIENTS UNDERGOING RADIOTHERAPY.

MR. PARIMAL PATWE
Medical Physicist - Department of Radiation Oncology

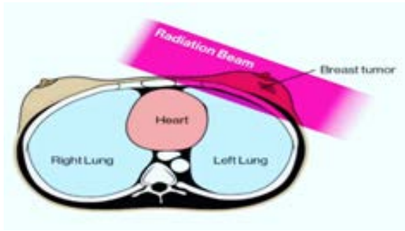
Breast cancer is the most common cancer amongst women in urban and second in rural India. As per GLOBOCAN 2020 projection, the new cases of breast cancer among Indian women will be around 1,70,000 per year. Breast cancer is typically treated with a combination of surgery, chemotherapy, hormone therapy, biological therapy, and radiation therapy based on the stage, hormonal status, and molecular and the genetic nature of the disease.

Radiation therapy (RT) plays vital role in the management of patients with breast cancer. However, breast radiotherapy inevitably delivers some radiation to the heart. Older RT methods often exposed the heart to significant doses of radiation, particularly in patients receiving radiation to left breast. A retrospective population based study from Norway shows that the relative risk for ischemic heart disease is increased by 7.4% for every 1Gy increase in mean heart dose.

Improvements and advances in radiation technology and delivery system over time have opened up doors for new treatment techniques. There are RT methods like APBI, Proton Therapy, IMRT, VMAT & DIBH to reduce the heart doses for the patients with left sided breast cancer. Out of these, Deep Inspiration Breath Hold (DIBH) is a simple, reproducible &well established treatment technique. The RT technologist guides the patient to breathe to the required threshold through intercom. When patient hold her breath as guided, her lungs expand and so heart is further from the treatment beam as shown in picture. This reduces the risk of X-rays damaging heart.



Heart position during free breathing



Heart position during DIBH

Radiation Oncology Department at NCI, Nagpur is equipped with Varian's trueBEAM SVC linac which has advanced RPM gating system to facilitate DIBH radiotherapy. Department launched its DIBH program in 2018. By end of year 2021, the department had treated about 50 patients with DIBH. Radiation Oncology team is working in tandem to improve and harmonize clinical practice in order to offer this heart sparing technique to more patients.

AS PATIENTS LIVE LONGER AND OFTEN CURED OF THEIR CANCER, TECHNOLOGIES LIKE DIBH WILL MAKE SURE THAT THEY DON'T SUFFER FROM LONG TERM CRITICAL ORGAN TOXICITIES DUE TO TREATMENT

Dr. Mahesh Upasani
Consultant Radiation Oncologist

04 WRITE UP - 7

THE COMPREHENSIVE QUALITY ASSURANCE OF IMRT AND VMAT USING ARCCHECK DIODE ARRAY, PORTAL DOSIMETRY AND LINAC TRAJECTORY LOG FILE DOSIMETRY.

MR. PRASHANT KUMAR SHINDE

Medical Physicist-Department of Radiation Oncology

Dr. Sameer Chandorkar **Parimal Patwe**
Dr. Mahesh Upasani **Mukesh Meshram**
Dr. Manish Mathankar **Rameshwar Veer**
Hemant Ghare Department of Radiation Oncology

ABSTRACT

IIn the modern era of Radiation Therapy (RT), treatment techniques evolved from conventional RT to the advanced state-of-the-art RT technique such as Intensity Modulated Radiotherapy (IMRT) and Volumetric Modulated Arc Therapy (VMAT). IMRT and VMAT highly conform the dose to irregular target volumes with rapid dose fall-off beyond the target periphery which resulted in the minimum dose to the surrounding normal tissues and organs at risk. Generating an optimized treatment plan using IMRT and VMAT is a very complex physical and mathematical problem. Hence the dosimetric evaluation of treatment delivery of an inversely optimized plan is of paramount importance before the plan is delivered to the patient. This study aimed to evaluate the robustness in treatment planning and delivery of IMRT and VMAT treatment plans [Figure-1] and to evaluate the comprehensive and robust Quality of the TrueBeam™ linear accelerator treatment delivery System. This study comprised the assessment of patient-specific treatment plan quality assurance using ArcCHECKTM Diode array (AC) [Figure-2 & 3],Varian™ aSi-1200 EPID based portal dosimetry (PD) [Figure-4], and treatment Trajectory Log File (TLF) analysis [Figure-5] of thirty patients who underwent IMRT and VMAT treatment on Varian TrueBeam™ linear accelerator. All Treatment plans were calculated using AnalyticalAnisotropic Algorithm(AAA) in Eclipse™ (v13.7) Treatment planning system (TPS). TLF was created in the TrueBeam™ delivery and record system after delivery of the treatment plan. These TLFs were analyzed using open-source Assurance QA software. Gamma analysis metric of DTA (Distance to Agreement) 3mm & 3% with a threshold dose of 10% was used for gamma analysis of TPS and measured or delivered fluence comparison. The average gamma pass rate (%) ($\gamma \leq 1$) of QA plans for AC, PD, and TLF QA was 99.05 ±1.04, 98.38 ±1.63, and 99.93 ±0.08, respectively [Figure-6(a)]. The mean of average gamma (γAverage) for AC, PD and TLF was 0.37 ±0.09, 0.38 ±0.05 and 0.08 ±0.08 respectively [Figure-6(d)]. The One-way-ANOVA test between AC, PD, and TLF for means of $\gamma \leq 1$, $\gamma > 1$, γAverage, and γmax of IMRT and VMAT plans showed that their means are statistically different ($P < 0.05$).The Comparable results of gamma analysis for ArcCHECK™, portal dosimetry, and Trajectory log file show comprehensive and robust Quality of TrueBeam™delivery system. Portal dosimetry can be used as a quick and efficient quality check system. Trajectory log file Analysis saves time forQA setup and is avery good tool for quick and reliable dosimetry verification for patient-specific Plan quality assurance.

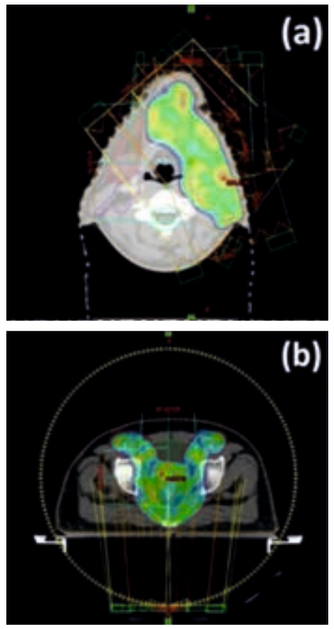


Figure 1. Highly conformal Intensity Modulated Radiotherapy (a) and Volumetric Modulated Arc Therapy (b).

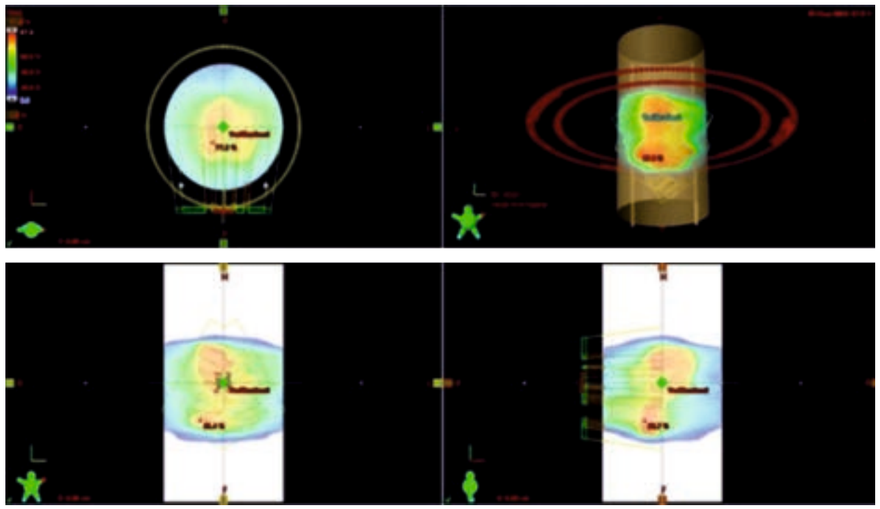


Figure 2. Patient specific VMAT quality assurance plan calculated on cylindrical ArcCHECK detector array in TPS.

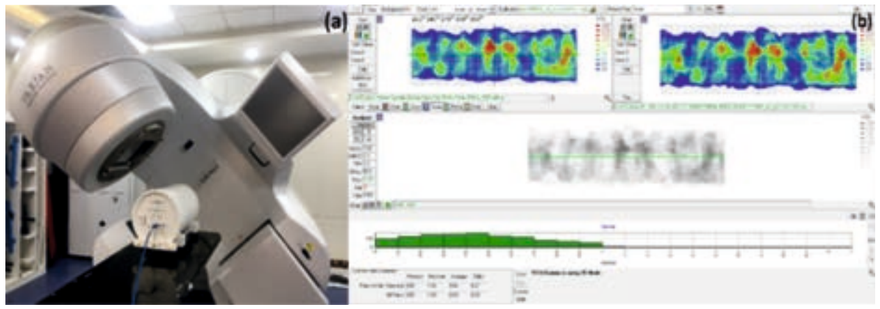


Figure 3. ArcCHECK QA delivery (a) and Planned dose fluence vs measured dose fluence Gamma Analysis (b).

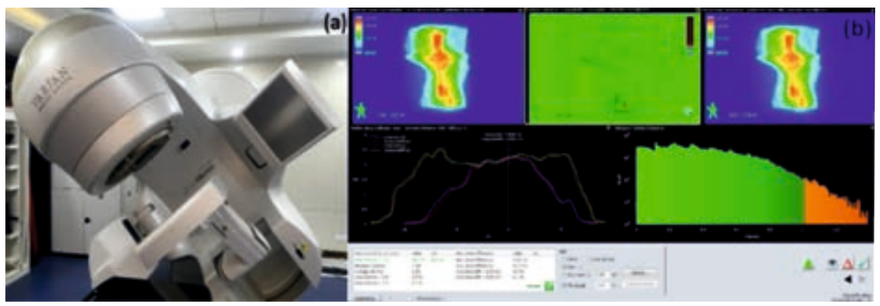


Figure 4. Portal Dosimetry QA delivery (a) and Planned dose fluence vs measured dose fluence Gamma Analysis (b).

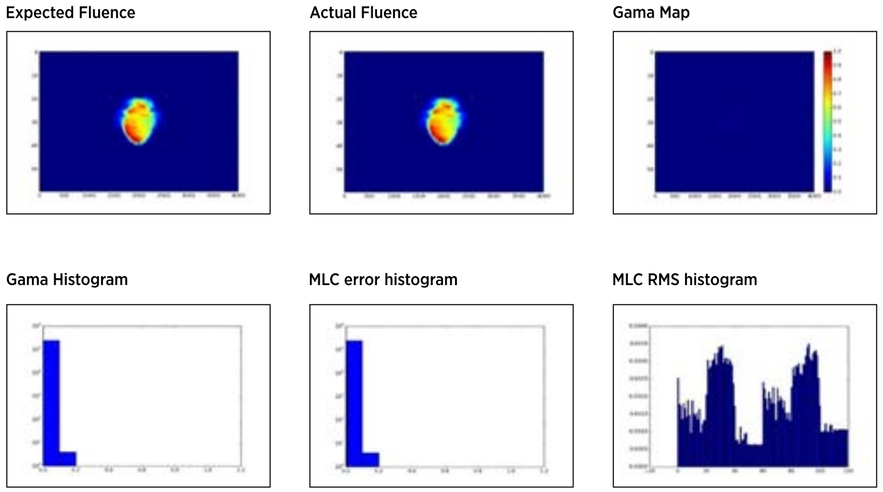


Figure 5. Trajectory Log File (TLF) Gamma analysis between Expected (planned) fluence and Actual (TLF derived) Fluence.

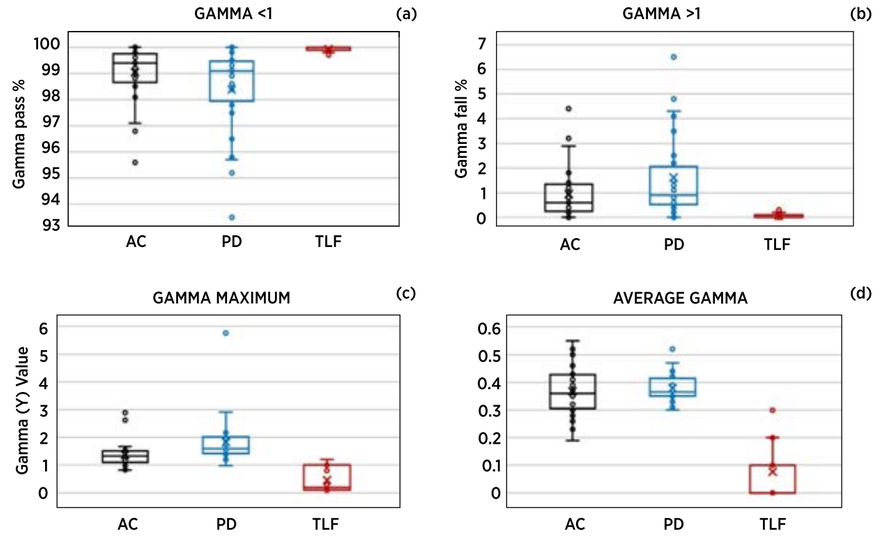


Figure 6. Box and whisker plot of Gamma pass rate (%), Gamma Failure Rate (%), Maximum Gamma value and Average Gamma value for ArcCHECK QA (AC), Portal Dosimetry QA (PD) and Trajectory Log File QA (TLF).

HEAD & NECK CANCERS AT NCI AN OVERVIEW GLOBOCAN 20 Vs NCI 21

MS. SHARAYU CHAOJI
Biostatistician

Introduction

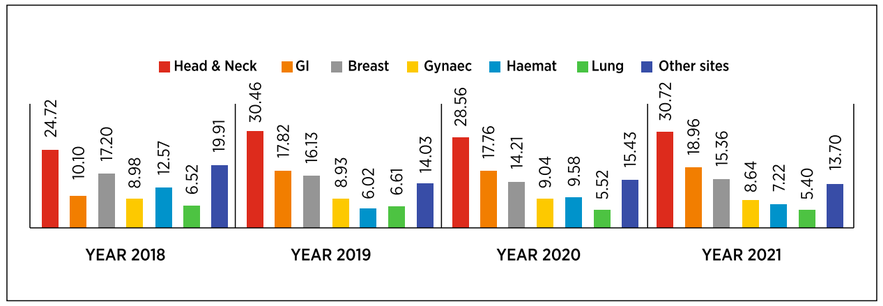
Head and neck cancers mainly involve the lip, mouth (oral cavity), throat (pharynx) and voice-box (larynx). Additionally, cancer of major and minor salivary glands and thyroid glands are also included in head and neck cancers.

Globally, non-communicable diseases (NCDs) accounted for 71% of total deaths. In India, NCDs were estimated to account for 63% of all deaths, and cancer was one of the leading cause (9%) of the same. Head and neck cancers constitute one third of the total cancer burden in India. The actual burden of head and neck cancer in India is much greater than reflected through the existing literature and hence can be regarded as a 'tip of an iceberg'.

The Cancer Atlas project by the Indian Council for Medical Research (ICMR) has shown the incidences of various cancers in different parts of India. Ninety percent of the oral cancer patients in rural areas belong to the lower or lower-middle socio-economic class, and 3.6% are below the poverty line.

Head and neck cancers are among the 10 most common cancers globally and are the most common cancers in developing countries, especially in Southeast Asia. In India, it accounts for one fourth of male cancers and one tenth of female cancers.

GRAPH 1: CANCER BURDEN AT NCI (YEAR 2018-2021)



NCI'S 2021 STATISTICS AS COMPARED WITH GLOBOCAN 2020

TABLE 1: COMMON CANCERS IN BOTH SEXES

Sr. No	Rank	World	%	Asia	%	India	%	NCI	%
1	I	Breast	11.72	Lung	13.84	Breast	13.47	Lip & oral cavity	25.13
2	II	Lung	11.44	Breast	10.80	Lip,oralcavity	10.26	Breast	15.36
3	III	Colorectum	10.01	Colorectum	10.62	Cervixuteri	9.36	Lung	5.42
4	IV	Prostate	7.33	Stomach	8.63	Lung	5.47	Oesophagus	3.78
5	V	Stomach	5.65	Liver	6.91	Colorectum	4.93	Ovary	3.24
6	VI	Liver	4.69	Oesophagus	5.07	Oesophagus	4.77	Cervix	3.14
7	VII	Cervixuteri	3.13	Prostate	3.91	Stomach	4.55	Rectum	2.33
8	VIII	Oesophagus	3.13	Cervixuteri	3.70	Leukaemia	3.66	Colon	2.31
9	IX	Thyroid	3.04	Thyroid	3.68	Ovary	3.45	HCC/Liver	2.04
10	X	Bladder	2.97	Lip,oralcavity	2.61	Non-Hodgkin lymphoma	2.71	Stomach	1.54

TABLE 2: COMMON CANCERS IN MALES

Sr. No	Rank	World	%	Asia	%	India	%	NCI	%
1	I	Lung	14.27	Lung	17.76	Lip, oralcavity	16.20	Lip, oralcavity	46.55
2	II	Prostate	14.05	Colorectum	11.49	Lung	8.00	Lung	6.96
3	III	Colorectum	10.59	Stomach	11.10	Stomach	6.30	Oesophagus	4.50
4	IV	Stomach	7.15	Liver	9.40	Colorectum	6.25	Colon	3.15
5	V	Liver	6.28	Prostate	7.39	Oesophagus	6.22	HCC/Liver	2.95
6	VI	Bladder	4.38	Oesophagus	6.58	Prostate	5.35	Prostate	2.86
7	VII	Oesophagus	4.16	Lip,oralcavity	3.55	Larynx	4.67	Rectum	2.82
8	VIII	Non-Hodgkin	3.02	Bladder	3.26	Leukaemia	4.38	Stomach	1.96
9	IX	Kidney	2.69	Non-Hodgkin lymphoma	2.73	Liver	3.75	Urinary Bladder	1.80
10	X	Leukaemia	2.68	Leukaemia	2.63	Hypopharynx	3.46	Pancreas	1.55

TABLE 3:COMMON CANCERS IN FEMALES

Sr. No	Rank	World	%	Asia	%	India	%	NCI	%
1	I	Breast	24.51	Breast	22.89	Breast	26.29	Breast	35.10
2	II	Colorectum	9.38	Colorectum	9.65	Cervixuteri	18.27	Lip,oralcavity	16.34
3	III	Lung	8.35	Lung	9.44	Ovary	6.74	Ovary	7.54
4	IV	Cervixuteri	6.55	Cervixuteri	7.85	Lip,oralcavity	4.61	Cervix	7.35
5	V	Thyroid	4.86	Thyroid	5.92	Colorectum	3.68	Lung	4.65
6	VI	Corpus uteri	4.52	Stomach	5.86	Oesophagus	3.39	Oesophagus	3.65
7	VII	Stomach	4.01	Liver	4.13	Lung	3.07	Endometrium	3.46
8	VIII	Ovary	3.40	Ovary	3.81	Leukaemia	2.97	Rectum	2.18
9	IX	Liver	2.96	Corpusuteri	3.73	Stomach	2.88	Thyroid	2.04
10	X	Non-Hodgkin lymphoma	2.60	Oesophagus	3.37	Corpusuteri	2.42	Colon	1.76

NCI has reported the highest i.e.46.55% incidence rate for lip and oral cavity cancer in males and second highest i.e. 16.34% inFemale

Head –Neck Cancers trend in India: GLOBOCAN-2020

Year	Male		Female		Both	
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
2020	181457	99601	51812	30770	233269	130371
2040	286976	158205	83657	50101	370634	208306
% increase	58.15%	58.84%	61.46%	62.82%	58.89%	59.78%

In India, incidence of Head-Neck cancers including both the sexes is expected to increase by 58.89% while mortality is expected to increase by 59.78% in year 2040. This is a very alarming statistics.

Risk Factor:

Tobacco use including smoking cigarettes, cigars, or pipes, chewing tobacco, and using snuff is the single largest risk factor for head and neck cancer. Researchers estimate that 70% to 80% of head and neck cancers are linked to tobacco use, and the amount of tobacco use may affect its prognosis and disease outcome.

NCI's Head-Neck Cancer patient

statistics shows that 54% male and 25% Female patients were tobacco chewers.17% Male and 1% Female were cigarette smokers. 32% male and 1% Female had addiction for alcohol. Smoking, chewing tobacco and alcohol consumption are significant risk factors for causing Head-Neck Cancersas compared to other Cancers (P=0.000408).

Steps toward better tomorrow -DMG CELL:

Increase in Head-Neck Cancer burden at NCI resulted in the formation of DMG cell to give quality treatment to patients where treatment will be decided by the multidisciplinary team. Rehabilitation, counselling, and nutritional therapy will play important role to improve patient's adherence to the treatment and survival. were cigarette smokers. 32% male and 1% Female had addiction for alcohol. Smoking, chewing tobacco and alcohol consumption are significant risk factors for causing Head-Neck Cancersas compared to other Cancers (P=0.000408).

The goal of Disease Management Group is to identify patients who are at risk of Head-Neck cancer. It also aims to address the disease effectively and efficiently with the best clinical outcome possible regardless of the treatment settings or typical reimbursement patterns. Disease Management Group (DMGs) have structured treatment plans that aim to help people better manage their disease and to maintain and improve quality of life.

On an average, 100 new Head and Neck Cancer patients take benefit of this cell per month.

HEAD NECK CANCERS CONTINUES TO TOP THE LIST OF COMMON CANCERS IN CENTRAL INDIA. WITH THE NUMBERS QUOTED ABOVE WE ARE A HIGH VOLUME HEAD NECK CANCER CENTER. SURVIVAL RATES ARE DEFINITELY IMPROVING. WE HAVE MADE HEAD NECK CANCERS AS A TOP RESEARCH PRIORITY AT NCI

Dr . Abhishek Vaidya, Head Neck Cancer Surgeon, NCI

CONCEPT OF RIOT AND ONCOANESTHESIA

DR VIVEK BHARGAVA
Head of Department - Anaesthesia

CONCEPT OF RIOT AND ONCOANESTHESIA

'Concept of RIOT and oncoanesthesia - RIOT means duration between surgery and either commencement of intended oncologic therapy or resumption of neoadjuvant preoperative therapy after a break for surgery.

There are conflicting studies specifically done with patients of ovarian cancer and it is not yet known whether RIOT has a role in better control of cancer or early commencement of chemotherapy after surgery has adverse outcome or not.

Hayden and colleagues have done an RCT on 40 females undergoing surgery for ovarian cancer. They did intraperitoneal infiltration of 40ml of 0.1% Ropivacaine with intermittent boluses over 72 hours. This reduced RIOT interval from median 29 to 21. This was one of the first trials to use RIOT as primary outcome while studying anesthetic intervention, though they didn't mention the mechanism for it. Current data is very limited and inconclusive about anaesthesia and RIOT. '

Role of anesthesiologist is to have speedy and optimum recovery from surgery. As interventions in oncoanesthesia are focused on intraoperative period, our ability to alter RIOT with current intraoperative techniques and ERAS program may be limited.

Further studies may focus on programs such as preoperative exercise training, nutrition, psychological support, prehabilitation to look for their influence on RIOT

Immunotherapy in Cancer

Development of immune check point blockade for cancer treatment has been an immense success in few cancers. It has changed the paradigm of treatment. Immune-oncology is fast becoming a large sub specialty of cancer therapeutics.

BLOG

Dr Murtaza Bohra, Consultant Medical Oncology, NCI

COVID 19 DISEASE- OUR EXPERIENCE AT NCI NAGPUR.

DR PRADEEP MISHRA
Head of Department Internal Medicine & Critical Care

DR GIRISH DESHPANDE
Sr. Intensivist & Physician
Internal Medicine & Critical Care

INTRODUCTION

At the end of 2019, a novel coronavirus was identified as the cause of a cluster of pneumonia cases in Wuhan, China and it rapidly spread across the world causing a pandemic. The virus is designated as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease COVID 19, which stands for coronavirus disease 2019. Cancer patients are at a higher risk of suffering more severe clinical disease and also adverse outcomes.

We hereby share our experience of Covid 19 during the first and second wave of COVID-19pandemic.

OBSERVATIONS

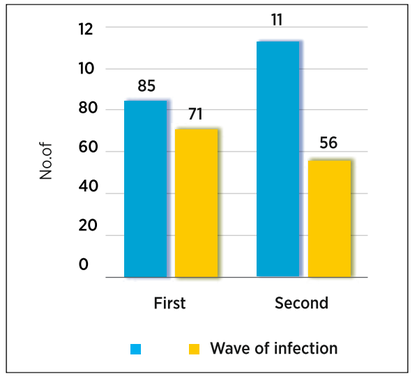
Table 1: Gender wise distribution of admitted COVID-19 patients

Sr. No.	Gender	First wave	%	Second wave	%	Total	%
1	Male	85	54.49	113	66.86	198	60.92
2	Female	71	45.51	56	33.14	127	39.08
	Grand Total	156	100.00	169	100.00	325	100.00

Table 2: Age group of COVID-19 patients

Sr. No.	Age group	First wave	%	Second wave	%	Total	%
1	1 TO 20	10	6.41	9	5.33	19	5.85
2	21 TO 40	79	50.64	28	16.57	107	32.92
3	41 TO 60	43	27.56	65	38.46	108	33.23
4	61 TO 80	21	13.46	59	34.91	80	24.62
5	81 & above	3	1.92	8	4.73	11	3.38
	Grand Total	**156**	**100.00**	**169**	**100.00**	**325**	**100.00**

Graph 1: Gender and Age wise distribution of admitted COVID-19 patients



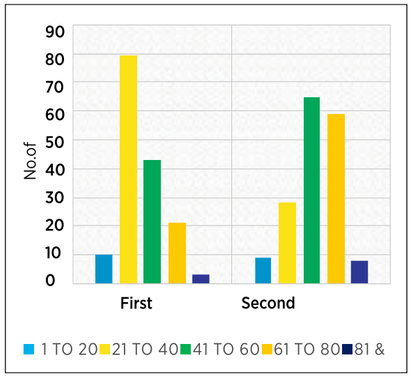


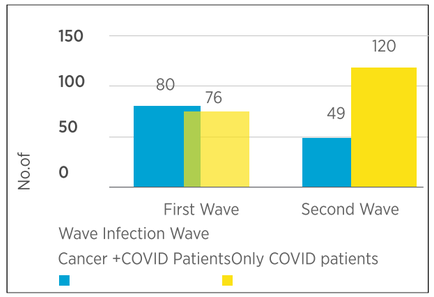
Table 3.1: Diagnosis of COVID-19 patients

Sr.No.	Diagnosis	First wave	%	Second wave	%	Total	%
1	COVID+ Cancer Patients	80	51.28	49	28.99	129	39.69
2	Only COVID patients	76	48.72	120	71.01	196	60.31
	Grand Total	**156**	**100.00**	**169**	**100.00**	**325**	**100.00**

Table 3.2: Type of Cancer in COVID-19 patients

Sr.No.	Cancer Diagnosis	First wave	%	Second wave	%	Total	%
1	Breast	7	8.75	2	4.08	9	6.98
2	Gastrointestinal	3	3.75	7	14.29	10	7.75
3	Gynaecological	4	5		0.00	4	3.10
4	Haematological	21	26.25	12	24.49	33	25.58
5	Head & Neck	8	10	4	8.16	12	9.30
6	Lung	10	12.5	6	12.24	16	12.40
7	Others	27	33.75	18	36.73	45	34.88
	Grand Total	**80**	**100**	**49**	**100.00**	**129**	**100.00**

Graph 2: Diagnosis of patients



Graph 2: Diagnosis of patients

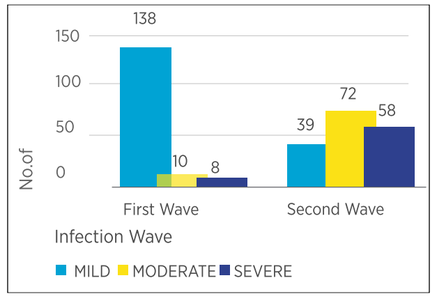


Table 4: Clinical staging of COVID-19 patients

Sr. No.	Clinical Stage	First wave	%	Second wave	%	Total	%
1	Mild	138	88.46	39	23.08	177	54.46
2	Moderate	10	6.41	72	42.60	82	25.23
3	Severe	8	5.13	58	34.32	66	20.31
	Grand Total	**156**	**100.00**	**169**	**100.00**	**325**	**100.00**

Table 5: Length of Hospital Stay of admitted COVID-19 patients

Sr.No.	Length of Stay	First wave	%	Second wave	%	Total	%
1	0 to 5	67	42.95	78	46.15	145	44.62
2	6 to 10	52	33.33	52	30.77	104	32.00
3	11 to 15	32	20.51	23	13.61	55	16.92
4	16 to 20	1	0.64	9	5.33	10	3.08
5	21 to 25	1	0.64	5	2.96	6	1.85
6	26 to 30	1	0.64	1	0.59	2	0.62
7	31 to 43	2	1.28	1	0.59	3	0.92
	Grand Total	**156**	**100.00**	**169**	**100.00**	**325**	**100.00**

WAVE-1

Table 6: Outcome of admitted COVID-19 patients based on severity of illness in first wave

Outcome(N=156)	No O2 support	O2 support	BIPAP/NIV/AC-VC support	Total	%
Discharge	132	12	0	144	92.31
Discharge On Request	2	0	0	2	1.28
Death	0	5	5	10	6.41
Total	134	17	5	156	100
%	85.90	10.90	3.21	100.00	

WAVE-2

Table 7: Outcome of admitted COVID-19 patients based on severity of illness in Second wave

Outcome (N=169)	No O2 support	O2 support	BIPAP/NIV/AC-VC support	Total	%
Discharge	74	49	5	128	75.74
Discharge on request/DAMA	3	1	1	5	2.96
Death	0	10	26	36	21.30
Total	77	60	32	169	100.00
%	45.56	35.50	18.93	100.00	

Table 8: Total deaths due to COVID-19 at NCI during First and Second wave

Sr. No.		First Wave			Second Wave			In both waves		
		Total Admissions	Total Deaths	**% of deaths**	Total Admissions	Total Deaths	**% of deaths**	Total Admissions	Total Deaths	**% of deaths**
1	COVID +Cancer	80	5	**6.25**	49	3	**6.12**	129	8	**6.20**
2	COVID	76	5	**6.58**	120	33	**27.50**	196	38	**19.39**
		156	10	**6.41**	169	36	**21.30**	325	46	**14.15**

TREATMENT

The patients were treated as per institutional protocol based on ICMR guidelines.

CONCLUSION

Our clinical experience of COVID19 disease at NCI Jamtha is in concordance with the worldwide experience. The first wave was milder in all respects as compared to the second wave. Cancer patients in general were at increased risk of suffering more severe disease and also had higher morbidity and mortality. The high adverse outcome in our non-cancer patients during the second wave was mainly due to their late presentation. Adverse outcome was most marked for those patients who required invasive ventilator support.

IMPACT OF COVID-19 PANDEMIC CAUSED ON SERVICES PROVIDED BY

MS. SHARAYU CHAOJI
Biostatistician

NATIONAL CANCER INSTITUTE IN COMPARISON WITH NATIONAL CANCER GRID OF INDIA

COVID-19 pandemic affected the health care systems globally and resulted in the interruption of usual care in many health care facilities, exposing vulnerable patients with cancer to significant risks.

Global data shows that during the COVID-19 pandemic, there has been a reduction in the number of patients accessing cancer services across countries, irrespective of the income status.

The National Cancer Grid of India is a large network of more than 230 cancer centres and research institutions, which provides more than 60% of cancer care in India. The National Cancer Grid strongly recommended the continuation of cancer care early in the course of pandemic. The National Cancer Grid also suggested strategies to prioritise treatment and to modify existing protocols to optimise strained resources and to reduce risks to the patients. Globally and in India, real-world data about the true impact of COVID-19 pandemic on cancer services at a national scale is scarce. It also aimed to assess the impact of the COVID-19 pandemic on the provision of oncology services across 41 high volume cancer hospitals in India.

Table 1: Provision of hospital oncology services across all participating NCG centres between March1 and May 31, 2020, compared with the same period in 2019

Services across all NCG centres	Number of centres that provided data	March–May, 2019, n	March–May, 2020, n	Percentage reduction*
New patient registrations	40	112 270	51 760	54%
Total outpatient clinic visits	37	634 745	340 984	46%
Hospital admissions	39	88 801	56 885	36%
Major surgeries	38	17 120	8677	49%
Minor surgeries	36	18 004	8630	52%
Outpatient chemotherapy	40	173 634	109 107	37%
Patients undergoing external beam radiotherapy	37	51 142	39 365	23%
Imaging reports (CT and MRI)	31	93 449	53 560	43%
Pathology reports	32	398 373	246 616	38%
Palliative care referrals	27	19474	13890	29%2729%

The results of Lancet study at 41 high volume cancer centres (NCG) in India showed considerable reductions in the provision of **all oncology services** between March- May 2020, compared with the corresponding time period in 2019.

UNHAMPERED SERVICES OF NATIONAL CANCER INSTITUTE

National Cancer Institute never stopped any of its services during the COVID waves. It continued its Cancer patients care without any interruption. NCI started educating its staff, patients and patient's relativesregarding infection prevention and control practices. NCI meticulously followed all the guidelines of WHO, ICMR and CDC . Use of mask, social distancing and hand sanitisation practice by staff, patients and visitors was implemented. It restricted the number of accompanied persons with each patient. Each and every one was screened before entering the facility at the check post . A fever ward was set up to accommodate suspected patients as well as staff of COVID-19 . Amidst this there was no distraction from cancer care.

To assess the impact of COVID-19 pandemic on services provided by the National Cancer Institute, data was collected regarding patient registrations, number ofpatients visiting outpatient clinics for follow-up, hospitaladmissions,daycareadmissionsforchemotherapy,Minor surgeries which does not require hospital admission, major surgeries which require hospital admission, patientsaccessingradiotherapy and finally the diagnostic tests like pathology ,radiology andpalliativecarereferrals.

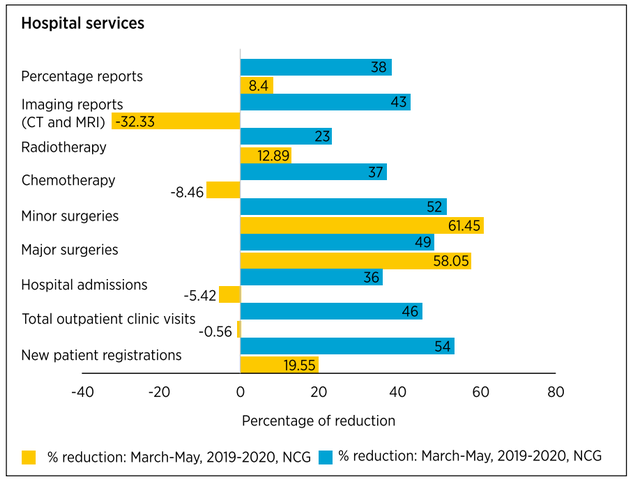
Data collection was divided into March –May, 2020(First wave) and March –May, 2021(Second wave) and was compared with the corresponding time period in 2019 as undertaken in Lancet Onco 2021 study 'Impact of COVID-19 on cancer care in India: a cohort study'of NCG. Following result s were obtained.

Table 2: Impact of COVID-19 on Cancer Care services in National Cancer Institute

Services provided in NCI	March–May 2019, n	March–May 2020, n	March-May 2021, n	19-20 % reduction*	19-21 % reduction*	20-21 % reduction*
New patient registrations	1432	1152	1096	19.55	23.46	4.86
Total outpatient clinic visits	25761	25904	31704	-0.56	-23.07	-22.39
Hospital admissions	3728	3930	4538	-5.42	-21.73	-15.47
Major surgeries	174	73	195	58.05	-12.07	-167.12
Minor surgeries	83	32	82	61.45	1.20	-156.25
Outpatient chemotherapy	2918	3165	3462	-8.46	-18.64	-9.38
Patients undergoing external beam radiotherapy	287	250	304	12.89	-5.92	-21.60
Imaging reports (CT and MRI)	1197	1584	2127	-32.33	-77.69	-34.28
Pathology reports	27823	25486	33898	8.40	-21.83	-33.01

At NCI, registration of new patient, major-minor surgeries, radiotherapy and pathology tests were reduced in number during first wave but during second wave of COVID-19, only the new patient registration and minor surgeries were curtailed. The reduction in patient number was more likely due to fear of infection and the logistical restrictions due to the lockdown.

Graph 1:Oncology services between March 1 and May 31, 2020, compared with the March 1 and May 31, 2019 at NCG centres and NCI



REFERENCE:

"Ranganathan, P., Sengar, M., Chinnaswamy, G., Agrawal, G., Arumugham, R., Bhatt, R., Bilimagga, R., Chakrabarti, J., Chandrasekharan, A., Chaturvedi, H. K., Choudhrie, R., Dandekar, M., Das, A., Goel, V., Harris, C., Hegde, S. K., Hulikal, N., Joseph, D., Kantharia, R., Khan, A., ... National Cancer Grid of India (2021). Impact of COVID-19 on cancer care in India: a cohort study. *The Lancet. Oncology*, *22*(7), 970–976. **https://doi.org/10.1016/S1470-2045(21)00240-0**

MODERN PATHOLOGY

DR ANKITA TAMHANE
Junior Consultant-Department of Pathology

EDITORIAL

1. In the editorial **ReinhardBuettner** et al highlighted the importance of **deep molecular profiling of all lung adenocarcinomas** currently summarized under broad category of lung adenocarcinoma. Taking into consideration research work done by Kim et al and Yang et al author emphasized that all adenocarcinomas are quite different if evaluated with deep molecular profiling. This will not only lead to precise and effective therapies in advance stages but also better diagnose specific tumor entity with distinct molecular signature. This will help in predicting tumor progression and assessment of neoadjuvant therapies in resectabletumors. Thus integration of morphology and molecular profile should be done by the Pathologist.

2. **Sanjay Mukhopadhyay et al** questioned the **reporting of STAS (Tumor spread through air spaces) on frozen** sections. Zhou et al in his study evaluated 163 stage I lung carcinoma specimens and emphasized that even in the hands of an experienced pathologist STAS is both over diagnosed and under diagnosed on frozen at exceptionally high rate. Over diagnosis of STAS should be avoided as it leads to unnecessary lobectomy . STAS according to the author is a matter of debate. Supporters say that presence of STAS predicts nodal metastasis while opposition say that STAS is just an artefact. Zhou et al also proposed the determination of tumor grade on frozen than STAS for upgrading the surgery for lobectomy than just wedge resection. However more research is required in the same.

To conclude Zhou et al and other published studies on this subject, strongly suggest that the surgeons should not regard STAS on frozen section as the sole basis for converting a sub-lobarresection to a lobectomy.

REVIEW ARTICLE

1. **Anne M Mills et al** in her review article wrote on updates and **perspectives from pathologists point of view** in **targeting immune checkpoints in gynaecological malignancies.** Author highlighted the importance of MMR, PDL-1 testing by IHC. Determining tumor mutation burden, Pole testing by molecular testing. IHC evaluation of newly found immune suppressive checkpoints like LAG-3, TIM-3, TIGIT and VISTA and immune activating check points like CD 27, CD 40, CD 134, and CD 137 should be explored.

2. **Matthew G Hanna et al** highlighted the importance of **integrating digital practice into clinical practice.** Author extensively covered pros and cons of technology adoption. Also developments in digital pathology and specifications of pre, analytic al and post analytical factors were highlighted. Authors have put down importance of 5 'S" in implementing digital pathology, Sponsorship from leadership, Space, Staffing, Storage and scanners. Low throughput devices, dynamic robotic imaging devices and integrated microscopes will be the need of the hour. Varied uses with its implication and technical need will have to be considered. Authors highlighted the importance of considering this as a business model. Ultimately digital pathology will offer ready access to digital slides from any location, innovative workflows, advancing pathology through clinical transformative solutions using machine learning and decision support tools.

ORIGINAL ARTICLES

1. **Hyunju Park et alclassified follicular thyroid carcinoma depending upon the TERT promoter mutation status.** It was used to predict Disease free survival and cancer free survival. Cancer free survival was significantly different in encapsulated angioinvasive follicular thyroid carcinoma when compared as TERT wild type vs TERT mutated. Whereas it was not significantly different in minimally invasive or widely invasive follicular carcinomas. Thus it was concluded that TERT promoter mutations is effective in predicting CSS in FTC patients, thereby improving DFS predictability.

2. **Christopher J Schwartz et al** predicted the **clinical behaviour and genomic features of solid variant of adenocarcinoma with basaloid features.** Authors concluded that solid and basaloid adenoid cystic carcinomas are molecularly heterogeneous but clinically aggressive group of tumors.

3. **Jianghua Wu et al** documented the **heterogeneity of PDL1 in primary and metastatic non small cell lung carcinoma specimens.** In metastatic tumors there was higher PDL1 expression and lower CD 8 + cytotoxic T lymphocytes (CTLs) and longer spatial distance between CTLs and tumor cells as compared to primary tumors. MTs showed significantly higher PD-L1 expression and lower lymphocyte infiltration in metastatic NSCLC with EGFR mutations. Increased density of CD8+ CTLs in metastatic tumors was associated with better overall survival.

4. **Akihiko Yoshida et alexplored rare and novel SSX1 fusions to non – SS18 genes in synovial sarcomas.** Authored evaluated 11 cases which were previously reported as negative or intermediate on SS18 break apart FISH. Based on a DNA methylation-based unsupervised clustering, the tumors with EWSR1-SSX1 and SS18L1-SSX1 clustered with synovial sarcoma, while the MN1-SSX1-positive tumor was not co-clustered despite classic histology and immunoprofile. The expanded genetic landscape carries significant diagnostic implications and advances our understanding of the oncogenic mechanism.

5. **Huu-Giao Nguyen et al** investigated the association of consensus molecular subtype classification and mucin-to-tumor area quantification using a deep learning algorithm, and the expression of specific mucins in predicting CMS groups and clinical outcome in colorectal carcinomas.

6. **Maria Del Carmen Rodriguez Pena et al** evaluated the **designation of metastatic disease for discontinuous involvement of spermatic cord soft tissue, as introduced by the 8th edition of the AJCC staging.** Authors conducted a multivariate analysis after adjusting for age, histology, testicular tumor size, percent of embryonal carcinoma, lymphovascular invasion, and cord margin status, discontinuous involvement of spermatic cord soft tissue was significantly associated ($p = 0.011$) with advanced clinical stage at presentation. Thus they supported the recommendation by AJCC.

7. **Marta Mendiola et al** tried to **find prognostic implications of tumor infiltrating T cells in early endometrial carcinoma.** It was found that patients with high stromal T-cell fraction of CD3+ PD-1+ cells were associated with a 5-year relapse-free survival rate of 93.7% compared to 79.0% in patients with low CD3+ PD-1+ fraction. Moreover, in patients classically linked to a favourable outcome (such as endometrioid subtype and low-grade tumors), the stromal CD3+ PD-1+ T-cell fraction remained prognostically significant novel prognostic biomarker.

8. **LijuZOng et alanalyzed immune checkpoint V-domain Ig containing suppressor of T cell activation (VISTA) in endometrial cancers.** Authors stated that VISTA in immune cells was a prognostic factor overall, as well as in patients with endometrioid histology, independent of molecular subtype or CD8+ T-cell density. The data produced by this study, which was the largest to focus on VISTA expression in patients with endometrial cancer to date, suggest that VISTA is a predictor of improved survival.

9. **Abeer M Salama et al** provided **new insights into molecular mechanisms of HPV dependant and HPV independent SCC of vulva and vagina.** HPV status was determined using the HPV high-risk RNA ISH assay and/or by MSK-IMPACT. Well differentiated SCC were always HPV independent. Moderate to poorly differentiated SCC HPV independent had alterations in NOTCH pathway TERT promoter mutations and TP53 mutations. Also they showed increased tumor budding. HPV dependant SCC had PIK3CA mutations.

MODERN CANCER PATHOLOGY IS A MULTIDIMENSIONAL , MULTIDISCIPLINARY AND COMPLEX SCIENCE

DR MEENA PANGARKAR HOD
DEPARTMENT OF LABORATORY SCIENCES

07 REVIEW - 1

SET UP REPRODUCIBILITY OF PELVIC MALIGNANCY IN IGRT ERA – RTT PERSPECTIVE

MR. YOGESH NINAWE

TECHNOLOGIST, DEPARTMENT OF RADIATION ONCOLOGY

PURPOSE

Aim of the present study is to analyse the setup variations while treating pelvic malignancies via IGRT in our centre on high precision True Beam™ machine and how to minimize them.

INTRODUCTION

Pelvic malignancies are common in our Radiation Therapy Practice specially genecology in female. The pelvic malignancies commonly treated in our department are Cervix, Endometrium, Prostate, Rectum and Anal canal. In the current study we have analysed only cervix cases.

MATERIAL AND METHOD

We have evaluated data of 24 patients of Ca. Cervix cases treated in our centre via IGRT. All patients were immobilised in supine position by using appropriate immobilisation devices (orfit/ vaclock, Knee Rest, Ankle Rest). RT planning CT-SCAN were done in treatment position with Full Bladder protocol after proper alignment by LASER. All images were transferred to Eclipse (EC01) treatment planning system. Final plans were transferred and implemented on our high precision True Beam™ machine under image guidance. As per our institutional protocol for Ca. Cervix we took daily KV-CBCT images. KV-CBCT were analysed online and offline in Translational and Rotational errors.

RESULT/OBSERVATION

Common setup variations observed while treating pelvic malignancies were rotation, patient discomfort, mismatch in PTV due to bladder/rectum/bowel gas filling, tumour shrinkage, orfit loosening due to weight loss. We reviewed all KV-CBCT images online and made necessary corrections. Average Setup variation observed were (LR =0.35cm), (AP=0.38cm) and (SI=0.26cm).And rotational error observed less than 1.1 degree.

CONCLUSION

RTT plays key role to execute precise radiation treatment. These errors can be reduced further with maximum LASER marking on treatment area and daily KV-CBCT images which can reduce the setup error and this can deliver proper dose to target area. Offline CBCT review will help us to further minimize setup variation in a very busy department. Careful planning and execution, incorporation of this error in PTV while contouring would further help not to miss tumour and reduce toxicity by reducing dose to normal tissue.

Pediatric Oncology

At NCI, we want to invest in pediatric oncology to cure children with cancer so that they become the healthy citizens of India tomorrow. Therefore, the management has funding supports to all children with cancer to take state of art treatment.

BLOG

Shailesh Joglekar, General Secretary & CEO, NCI

07 REVIEW - 2

DOSIMETRIC EVALUATION OF FFF PHOTON BEAM FOR Ca. LUNG STEREOTACTIC BODY RADIOTHERAPY (SBRT)

MR. MUKESH MESHRAM

Medical Physicist-Department of Radiation Oncology

- **Dr. Sameer Chandorkar**
- **Dr. Mahesh Upasani**
- **Dr. Manish Mathankar**
- **Dr. Alok Chand**
- **Dr. Rahul Patil**
- **Dr. Shruti Maheshwari**
- **Hemant Ghare**
- **Prashantkumar Shinde**
- **Parimal Patwe**
- **Rameshwar Veer**

Department of Radiation Oncology

PURPOSE/ OBJECTIVE

This study aims to analyse the dosimetric advantages of FFF beam of Varian linear accelerator for SBRT of Lung carcinoma patients over flattened beam.

MATERIALS/ METHODS

Study group consisted of 9 patients with Lung Cancer who underwent SBRT treatment in Varian Truebeam linear accelerator. PTVs ranged between 13.5 to 100.6 cc. All the plans were generated using Eclipse Treatment planning system (v13.7). For each patient two different plans were optimized using 6MV and 6MV-FFF. All prescription doses, constraints parameter and beam setup were maintained same. The same normalization was used in both plans (80% isodose line covering 95% of the target volume). Both the optimized plan were evaluated and compared for the parameters as criteria defined by the RTOG 0915 protocol: We also analysed Plan total MUs and estimated Beam on time.

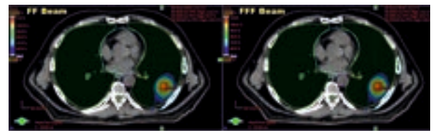
"Dose heterogeneity index for the PTV between plans with flattened and unflattened beams were observed to be the same.

Similar comparable values were obtained for both conformity indices CI-100 (0.97-1.12 in FF vs 0.96-1.1 in FFF) and CI-50 (3.06-4.23 in FF vs 3.05-4.18 in FFF).

Avg.	FF Plan	FFF Plan
HI	1.054	1.054
CI100	1.04	1.03
CI50	3.85	3.77
MUs	2293	2485
BOT	4.2 min	2.0 min

FFF plans required on average 9.1% more MU than flattened plans but the average beam on time was reduced by 52.4% passing from about 4.2 min (with FF modality) to 2.0 min (with FFF modality).

The differences in the max dose in the PTV as well as the dose at 2cm from PTV were <1% between 6MV and 6MV-FFF plans. .



The volume of healthy lung receiving ≥20Gy was 5.6% for 6MVplans and 5.4% for 6MV-FFF plans.

OAR	FF Plan Avg. (Gy)	FFF Plan Avg. (Gy)
SC Dmax	10.3	10.2
SC(<0.35 cc)	8.8	8.7
SC(<1.2 cc)	8.0	7.9
Brachial Plexus Dmax	0.4	0.4
Brachial Plexus (<3 cc)	0.2	0.2
Esophagus Dmax	17.3	17.3
Esophagus (<5 cc)	8.6	8.4
Heart Dmax	15	15
Heart (<15 cc)	9.4	9.3
Great Vessels Dmax	18.5	18.4
Great Vessels (<10 cc)	10.6	10.3
Trachea Dmax	9.4	9.4
Trachea (<4 cc)	6.2	6.1
Bronchus Dmax	13.7	13.5
Bronchus (<4cc)	8.4	8.2
Lung (1500 cc)	1.2	1.1
Lung (1000 CC)	3.0	2.7

CONCLUSION

FFF modality yields dose distribution comparable to the standard flat beam in lung SBRT with very small absolute and clinically insignificant differences in OAR doses. Furthermore FFF requires significantly less beam on time which is associated with excellent patient comfort and reduces the risk of intra-fraction motion. It also increases the feasibility of breath hold and gating techniques in lung SBRT.

BLOG

Operating Microscope at NCI

Looking at the heavy burden of head neck cancer patients at NCI, requiring major reconstruction, we have commissioned a state of art Karl Zeiss microscope at NCI, thanks to the support from the management.

Dr. Abhishek Vaidya, Senior, Head Neck Cancer Surgeon, NCI

National Cancer Institute

NEWS

ACADEMIC CORNER

DR SACHIN JAMBHORKAR, Coordinator- Academics
MS KARISHMA TIWARI

ACADEMIC ACTIVITY

NCI, conducts every Saturday academic activity for all Consultants, Clinicians, Nursing, Fellows, the initiation of this activity was on dated 26.5.2018 and till date we have conducted total 146academic activities.

ACADMEMIC PROGRAM AT NC

1.FELLOWSHIP COURSES :

NCI, started with the Fellowship courses under Maharashtra University of Health Sciences (MUHS) in the year 2019, we started with 4 courses in various specialties as mentioned, each course was allotted 2 seats:

1.Fellowship Course in Head and Neck Surgery

2.Fellowship Course in Body Imaging (CT and MRI of Chest and Abdomen)

3.Fellowship Course in Cytopathology

4.Fellowship course in Medical Oncology

The statistics depicts the picture as:

Sr No	Name of the Fellowship Course	No of Seat Allotted by MUHS	No of Students Enrolled			
			2019	2020	2021	2022
1	Fellowship Course In Head And Neck Surgery	2	2	1	1	1
2	Fellowship Course In Body Imaging (CT And MRI Of Chest And Abdomen	2	2	0	0	1
3	Fellowship Course In Cytopathology	2	2	2	2	0
4	Fellowship course in Medical Oncology	2	1	1	0	0

We applied for another 4 New fellowship courses along with the existing course in the Month of May 2021, and received the accreditation for all the courses as mentioned below:

1.Fellowship course in Onco Anaesthesia Critical Care and Pain Management

2.Fellowship course in Onco pathology

3.Fellowship in Infection prevention and control with specific reference to Hospital Acquired infections

Sr No	Name of the Fellowship Course	No of Seat Allotted by MUHS	No of Students Enrolled Year 2022
1	Fellowship course in Onco Anaesthesia Critical Care and Pain Management	2	0
2	Fellowship course in Onco pathology	2	2
3	Fellowship in Infection prevention and control with specific reference to Hospital Acquired infections	2	2

2. INTERNSHIP/OBSERVERSHIP

The institute has Observer ship/Externship in various speciality, the statics shows

Sr No	Department (observer ship/Externship)	No of Students completed the observership (2019-March 2022
1	Pathology	14
2	Head and Neck	11
3	OT and ICU	2
4	Anaesthesia	1
5	Rehabilitation	1
6	Radiation Oncology	1
7	Microbiology	1
8	Nurse	1
9	Patient Navigator	1
10	Operations and Quality	1

3. ACCREDITATION UNDER DIPLOMATE OF NATIONAL BOARD DrNB

National Cancer Institute received accreditation on October 2021 for running the course under DrNB in the department of Surgical Oncology, for a period of 5 years. 2 seats each year are allotted under thespeciality.
The faculty recognized as the mentor for the programme are,Dr Gopal Gurjar- HOD Surgical Oncology&Dr Abhinav Deshpande – Consultant Surgical Oncology

The Institute received the accreditation under DrNB for Medical Oncology on 17th March 2022, for a period of 5 years. 2 seats each year are allottedunder the speciality. The faculty recognized as the mentor for the programme are Dr Anand Pathak- HoD Medical Oncology & Medical Director&Dr Murtaza Bohra – Consultant Medical Oncology

4. NURSING PROGRAM

Post Basic Diploma in Oncology Nursing (PBDON) in collaboration with Maharshi Karve Stree Shikshan Sanstha, The course is meant for qualified nurses (GNM/B.Sc./M.Sc) Duration of the course was for 6 months.

5. PhD RECOGNITION

Our Institute was recognized by DattaMeghe Institute of Medical Sciences and Research, on 22.12.2021 as a Research Place for Carrying out the Doctorial Research in the speciality of Medical Oncology, under the faculty of Medical Sciences for a prospective period of five years. Dr Anand Pathak, Head of Department of Medical Oncology & Medical Director is recognized as a Ph.D Co- Supervisor in the Speciality of Medical Oncology under the faculty of Medical Sciences and designated as an Adjunct Faculty in the Department of General Medicine, Jawaharlal Nehru Medical College, Sawangi Wardha.

6. COLLABORATION WITH DATTA MEGHE INSTITUTE OF MEDICAL SCIENCES (DU)

National Cancer Institute and DattaMeghe Institute of Medical Science underwent a joint collaboration on 15.1.20222, for exchange of students, posting of Allied health sciences students, Posting of Physiotherapy interns, Posting of Nurses/ Nursing Students GNM,BSc , PBBSc, Posting of PG Residents, Posting of DNB Students of NCI to DMIMS. Collaboration for launching of new programs for ex : Fellowship in Nuclear medicine, robotic surgery, Onco-pathology, Infection Control, Molecular Biology, EDP- Palliative Oncology, Onco Nursing, Onco Rehab, Ayurveda Oncology, Brachy Therapy, Radiation Oncology. Joint Publications planned to explore possibility of starting journal of Rural oncology. DMIMS is providing us facility to utilize the service of animal research house for pre-clinical studies. Collaboration to start multi centric Clinical Trials. Planning of Joint Tumour board activity. Exploring of virtual transmission of surgeries /procedure from NCI to DMIMS with help of VR Technology.

NEWS FROM CLINICAL RESEARCH SECRETARIAT

DR KAMLESH MADANKAR, Chief Coordinator

INSTITUTIONAL ETHICS COMMITTEE

Our Institute has registered Institutional Ethics Committee since 18.11.2018, till date total 11 meetings are held, in which the committee addresses the ethical issues that arise in patient care and facilitate sound decision making that respects participants' values, concerns, and interests.

Number of Clinical Trials Completed: 0

Number of Clinical Trials Ongoing: 6

TITLES OF CLINICAL TRIALS:

1. **Protocol Title:** "A Phase II, Multicenter, Randomized, Open-Label Study To Evaluate The Safety And Efficacy Of 400mg Of Ribociclib In Combination With Non-Steroidal Aromatase Inhibitors For The Treatment Of Pre-And Postmenopausal Women With Hormone Receptor- Positive, HER2-Negative Advanced Breast Cancer Who Received No Prior Therapy For Advanced Disease.

2. **Protocol Title:** Randomized, Parallel Group, Phase Iii Study to Compare Safety and Efficacy of BFLUID With A Commercially Available Solution, NutriflexPeri, As A Control Product In Patients Undergoing Gastrectomy Or Colectomy

3. **Protocol Title:** "Single Arm Study to Evaluate The Safety Of Dacomitinib For The First-Line Treatment Of Participants In India With Metastatic Non-Small Cell Lung Cancer With Epidermal Growth Factor Receptor (Egfr)-Activating Mutations".

4. **Protocol Title:** Single-Arm Study To Evaluate The Safety Of Lorlatinib In Alk Inhibitor-Treated Unresectable Advanced And/Or Recurrent Alk-Positive Non Small Cell Lung Cancer Participants In India.

5. **Protocol Title :** "A Multicentric, Open-Label, Randomized, Two Period, Two Treatment, Two Sequence, Crossover, Multiple Dose, Ste-Ady State Bioequivalence Study Of Sunitinib Malate Capsules 50 Mg Of Eugia Pharma Specialities Limited (A Joint Venture Of Aurobindo Pharma Limited &Celon Laboratories Limited), India (Test) With Sutent® (Sunitinib Malate) Capsules 50 Mg Of Pfizer Labs, USA (Reference) In Adult Patients With Advanced Renal Cell Carcinoma Already Receiving Stable Dose Of Sunitinib Malate Capsules 50 Mg Under Fasting Conditions."

6. **Protocol Title:** A Prospective, Multi-Centre, Single Arm, Open Label, Phase IV Clinical Study To Evaluate Safety And Efficacy Of Denosureltm Containing Denosumab Manufactured By Reliance Life Sciences Pvt. Ltd. India For Prevention Of Skeletal Related Events In Patients With Bone Metastases From Solid Tumours.

NO. OF INHOUSE STUDIES - 1

Protocol Title: Phase 3 Randomized Study For Evaluation Of Physician Choice Rx And Triple Metronomic As Second Line Therapy In Head And Neck Cancer.

Number of in house Studies (Submitted to SRC): 50

Number of Scientific Research Committees Conducted: 19

QUALITY INITATIVES

MS KARISHMA TIWARI, EA to Medical Director & DM Quality

1.NABL (NATIONAL ACCREDITATION BOARD FOR TESTING AND CALIBRATION LABORATORIES) ACHIEVED ACCREDITATION FOR COVID-19 TEST

Under the guidance of Dr Anand Pathak –Medical Director and Dr Meena Panagarkar –Chief and HoD Pathology Department, the lab, achieved the first accredited test during pandemic for COVID-19 Testing on 20.9.2020. The accreditation was achieved under the supervision of Dr Sonali Choudhari and Dr Jerestin Watchmaker, with this accreditation we were able to conduct in house COVID -19 testing for our employees and patients.

Achieved accreditation for Test under Clinical Biochemistry and Haematology

We achieved the other milestone on April 2021 and successfully got accredited with Test for all the parameters of Clinical Biochemistry and Haematology under the Supervision of Dr Kishor Deshpande and Dr Chaitanya Munshi and team of pathology technicians.With this, the institute achieved and promises to continual improve the services of pathology.

2. CLINICAL QUALITY INITATIVES

1. The department of quality are planning clinical initiatives, implementing and monitoring of the Key Performance Indicator, throughout the hospital, mandatory as per NABH 5th Edition.
2. Developing Clinical and department related Standard Operating Procedure, in coordination with the HoD.

3. FUTURE PLAN

1. Achieving Full Accreditation of NABH as per 5th Edition & Joint Commission International (JCI).
2. Upcoming with NCI web portal, where in all the SOP, Process flow, forms, consent, and other documents will be available online on one click.

Childhood trauma can lead to an adulthood spent in survival mode, afraid to plant roots, to plan for the future, to trust, and to let joy in. It's a blessing to shift from surviving to thriving. It's not simple, but there is more than survival.

NEWS FROM NURSING DEPARTMENT

MS KUNJAN KULKARNI, Nursing Supervisor

"VISHNU PATNI NAMASTUBHYAM, PAADSPARSHYAMSHYAMASWA ME"

This is the true essence of our philosophy, our culture. The first thing you do after you wake up is bow down to the ground. This is to inculcate the trait of being humble towards everyone. This shloka that we learn at a young age is not just a prayer, it helps us to take responsibility for our actions. We convey our feelings to The Goddess that , "I will now stand upon thee, and I understand my actions" and in our culture it is deemed as a rude action to touch someone knowingly or unknowingly by our feet. So we ask the God for forgiveness. But this act of asking for forgiveness is not in vain, it is because we are aware of our actions towards other beings and the result it will have.

This is the true beauty of our culture! And, our profession also relies heavily on this notion, on awareness and on taking responsibility. To present a real life example, before we administer an injection, we have a habit of saying it out loud "I am giving you the injection" This expression is not mandatory but it shows that we care, we show empathy towards others.

This is the ultimate connection between our profession and our culture.

Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well, and in all settings. Nursing includes the promotion of health, prevention of illness, and the care of ill, disabled and dying people.

- We hold the 220 nurses at present
- Future expansion of institution nursing strength will be approximately 800 to 900 nurses.
- In nursing services involved in providing supportive care, Chemotherapy, preoperative care, post operative care, intensive care, paediatric care, palliative care
- Unique selling proposition (USP) - dedicated to cases, SEVA BHAV

1. SERVICES

Implementation on MEDNET chemo module for the patient. Nursing care is provided in the form of supportive care, Chemotherapy, preoperative care, post-operative care, intensive care, Neutropenic ward, Paediatric care, Operation theatre, palliative care, infection control nurse. Nurses also render the services in various department like radiotherapy, NMD, sample collection, emergency department. Nurses are also conduct outreach programs. Nursing is also part of Clinical Trials

2. ACADEMIC

On job bedside trainings are conducted on daily basis for all Nurses. Successful completion of Chemotherapy Training of 30 nurses. Conducted and published Research articles at International level.

3. OUR TEAM

Nursing team include nursing supervisor, deputy nursing supervisor, nurse educator, infection control nurse, Incharges and all the nursing staff.

NEWS FROM BIOSTATISTICIAN

MS SHARAYU CHAOJI

Role of Biostatistician is to analyse the numbers, crunch the math, and come up with trends and insights as to what things cause health issues and disease, which will help in finding corrective measures that can be taken to improve the overall health and wellness of the community.'

NEWS FROM OUTREACH

DR. PAWAN ARGADE, Manager Outreach

National Cancer Institute believes in guaranteeing 'Freedom from Fear of Cancer' for all – irrespective of caste, creed, gender and socio-economic standing. The first step towards this would be prevention of the disease called Cancer. NCI lays huge focus upon the prevention of Cancer.

National Cancer Institute aims to reach out to the people in remotest corners of the country for prevention of the disease. NCI has taken many initiatives for the spreading cancer awareness, educate the masses and early detection of cancer.

NCI believe that 'Early Detection Saves Lives' and with respect to this, has conducted camps in the rural areas to reach the remote corners of Maharashtra, especially Vidarbha region.

Under this project, NCI will aim at expanding its Care Spectrum by reaching out to people who are unaware, uneducated or cannot afford to come to NCI for cancer screenings. National Cancer Institute will operationalize this through the Clinical and Diagnostic vehicles already procured especially for the purpose of enhancing the community health infrastructure through our outreach programmes.

Mobile Diagnostic Units will be deployed in areas with limited or a complete lack of access to health care services.

The project aims to achieve the following objectives:

- To reduce the morbidity and mortality due to Cancer through opportunistic screening, treatment and follow up of people by penetrating into the hinterland, thus serving at the grassroots.
- Promote awareness and increase understanding of the fact that "Early Detection Saves Lives". Access to screening mechanisms will add to the responsiveness of the average population.
- Establishing channels for early detection of precancerous/cancerous conditions and smoothening the rigorous processes that act as unfavourable roadblocks to the treatment process.
- Not a single suspected person is left untreated
- Every Village/Location/Taluka to be covered
- To provide subsidized treatment and cancer care to all diagnosed patients
- To utilize the benefits of various Government schemes to economically weaker section of the society and provide free treatment to indigent patients
- To conduct further Cancer Screening Camps interiors of nearby regions.
- Sensitising the last man standing about the disease and its diagnostics, treatments and rehabilitation possibilities.
- To Conduct and Implement Cancer IEC (Information Education and Counselling) activity's and Tobacco Control activity's.
- Catalyse the efficient and effective use of existing knowledge and infrastructure resources.
- An entire care spectrum of preventive, early detection and curative services, being be made available to reinforce "Freedom from fear of Cancer"

Services Provided by The Screening Vans

- General Cancer Screening, Early detection and Clinical Check up
- Information Education Counseling (IEC) activities
- Visual Oral Examination
- Clinical Breast Examination
- Scrap Cytology oral lesion / Oral Lesion Tissue Biopsy / FNAC
- PV Examinational / VIA / VILI / Pap Smear / Endometrial Biopsy
- Mammography / X-ray
- Blood / Cytology / Tissue Sample storage and testing?
- Solid tumor Small Biopsy
- FNAC

NCI Outreach Report Till Date

SN	Location	No of Camps	Female	Male	Total	Suspected Patient	Already Diagnosed Patient
1	Nagpur(Rural)	79	3807	2909	6716	502	52
2	Nagpur(Urban)	71	2420	2002	4422	225	37
3	Wardha	16	845	596	1441	135	19
4	Bhandara	26	799	561	1360	283	60
5	Gadchiroli	10	499	464	963	75	1
6	Amravati	2	63	69	132	13	3
7	Gondia	2	109	61	170	10	3
8	Chandrapur	2	69	63	132	10	2
9	MP	4	79	105	184	11	4
	Total		**212**	**8690**	**6830**	**15520**	**1264181**

OBSERVATIONS FROM THE DESK OF MEDICAL SUPERINTENDENT

DR PRAKASH KAKANI

LOOKING BACK TO MARCH FORWARD

- More than 30,000 patients registered
- Varied types of Cancers diagnosed and treated from Leukaemias and Breast Cancer to the rare ones like Embryonal Undifferentiated Sarcoma & Epitheloid Haemangio-endothelioma
- Treated more than 10,000 patients with Financial constraints
- Chemotherapy started with simple Taxol Carbo Cisplatin to Most complex chemotherapy regimens and latest of Immuno-therapeutic drugs, including Entrectinib
- Surgeries started with MRM to now many advanced procedures like HIPEC, and extensive excisions and reconstructive surgeries
- Basic Radiotherapy 3D CRT to precision SBRT
- Treating young adults, adolescents & children to almost newborn babies
- Venturing into Radioisotopes - Theragnostics
- All milestones crossed with expanding support from
- Diagnostic teams – Imaging, Laboratory, Nuclear medicine
- Anaesthesia, Internal Medicine, Rehabilitation, Psychiatry, Transfusion Medicine
- Ongoing Clinical trials for multiple drugs
- Many papers published in Journals of repute
- Academic courses starting from in-house PBDON & PBDOC to MUHS recognized Fellowships and NBE recognized DrNB
- NCI being recognized as a Center for internship by Institutes like TISS and DMIMS
- Everlasting supply of Quality medicines, Latest equipment and Trained manpower; and administrative support
- All Encompassing, Never tiring Clinical Guidance &...
- All this while wading through Floods (literally) and Gasping with Covid Pandemic (physically).

Henceforth, NCI Looks Forward .....To March Forward.....

INITIATIVES FROM OPERATIONS:

Col (Dr) RAVI RAMANI

A REPORT ON TURN AROUND TIME OF NEW PATIENTS REGISTERING IN A TERTIARY CANCER CENTER FOR FIRST MEDICAL HISTORY TAKING.

Col Ravi Shankar Ramani, Dr Rituparna Deshmukh, Ms Manas iTikas

- Background & Introduction: Efficient patient flow is a consistent concern of clinical operations. Any hindrance to the flow will result in disturbance in delivery of prompt health care and ultimately leads to poor patient satisfaction. National Cancer Institute has its share of new patients visiting the hospital for the first time daily. In this study an effort was made to determine the average turn-around time for various processes involved till the patient reaches for first medical history taking.
- Significance of the Study: Delay in delivery of timely health care will poorly reflect on the quality of health care services of any tertiary cancer centre. Hence it is important to identify and understand the bottlenecks in the patient flow to address them for an enhanced quality care and patient satisfaction.
- Methodology: 241 new patients were studied from the time they reported to the security pass counter till the history taking was completed. The time taken from issue of visitor's pass till registration (T1), from registration till measurement of vitals (T2) and from vitals measurement till history taking (T3) were noted and recorded. Institutional standard turnaround time (TAT) was set as T1 30 mins, T2 15 mins& T3 as 20 mins.
- Results: Average T1 was 35:14, T2 was 25:56 and T3 was 42:43 mins. The TAT was more than the expected institutional standards set. Some of the factors that were observed which possibly contribute to the delay include, number of visitors making pass along with the patients, deputed staff not reporting to counter on time, unannounced breaks taken by the staff, inadequate signages in the premises, long walking from registration to vitals and then to history taking, insufficient guidance to patients, patients taking unannounced breaks and multi tasked RMOs.
- Conclusion: Patient Flow Analysis is an effective method to identify deficiencies in prompt and optimal patient care, which are paramount in quality health care. Once the deficiencies are identified by root cause analysis, they can be improved upon with appropriate and corrective operational interventions.

A STUDY ON IMPACTOF DEMOGRAPHIC & SOCIO-ECONOMIC FACTORS ON TURN AROUND TIME FOR NEW PATIENTS IN A TERTIARY CANCER HOSPITAL

Col Ravi Shankar Ramani, Dr Rituparna Deshmukh, Ms Manasi Tikas

- Background & Introduction: A study titled on 'Turnaround time of new patient registration to medical history taking' was conducted at National Cancer Institute, Jamtha, Nagpur, in which the time – motion of 214 new patients registered with the institute were studied. It was observed that average turn-around time taken for the processes such as patient registration, movement towards vitals and history taking were exceeding the institute standard. To see if patients' socioeconomic factor has any impact on this delay in average turn-around time.
- Significance of the Study: Studies have shown that individuals with lower education, and economic resources experience more waiting time for diagnostic procedures and in specialist OPD. Education and economic resources are found to be two main variables in both men and women that affects waiting times. Hence it was desired to study and analyse the significance of the socioeconomic factors related to waiting time.
- Methodology: 198 patients visiting the OPD were distributed with questionnaire consisting of eight questions, and documented their status of appointment, mode of transport, marital status, educational qualification, employment status, ambulation, religion, and annual income. The time of registration and time of history taking were recorded.
- Results: Average waiting time from registration to history taking was more for patients who came without appointment (87%), aged 30-60 (64%), females (46%), those who travelled by public transport (22%), unmarried (4%), those without any formal education (9%), unemployed (58%), non-ambulatory patients (11%), Hindus (93%), and in those from low-income group (53%). The overall average waiting time for all patients were within the institute standard of 65 minutes.
- Conclusion: Patient wait times may seem like a minor part of the patient experience, but they can have a significant effect on overall patient satisfaction. Long wait times does not just mean unhappy patients, it is a sign that there is a need to boost efficiency of timely practice or risk losing revenue and genuine clientele.

ADOPTION OF NEW TECHNOLOGY AT NCI

DR PRANAM SADAVARTE AND DR ABHISHEK VAIDYA

1. Highlights of Operating Microscope At National Cancer Institute, Nagpur

Microvascular reconstruction is a boon for cancer patients. There were plenty of inoperable cases in the era previous to microvascular reconstruction which can be made operable just because of the efficient reconstruction surgeries. Microvascular reconstruction surgery involves removal of bone/ skin/ muscle/ soft tissue along with its arterial and venous blood supply from the patient's part of the body and attaching it along with its blood supply to the recipient site.

The survival of newly transferred tissue depends on the vascularity of the tissue and the viability of the anastomotic vessels. Use of operating microscope for reconstruction surgery has made it possible to do anastomosis of blood vessels with diameter as small as 1 – 1.5 milimeter.

Head and neck surgeries comprise a major bulk of operative procedures at our centre. Microvascular reconstruction plays a vital role in treatment management of head and neck surgeries. Free fibula bone composite transfer is done for neomandible reconstruction. Other type of flaps used in head and neck cancer surgeries is anterolateral flap with radial artery forearm flap. Maintaining balance between minimal donor site morbidity along with recipient site benefit is important.

At present National Cancer Institute (NCI) has installed Zeiss Tivato Operating microscope, one of its kind for doing these microvascular surgeries. It gives 40 times magnification along with stability and field vision of about 12 cm in diameter. Anastomosis of tiny blood vessels with diameter as small as 0.8 – 1 mm can also be achieved. Our team at NCI has been routinely doing approximately 50 cases per year of radial artery anastomosis which itself is a tricky procedure even by the expert hands.

NEWS FROM PAIN CLINIC

DR. HIMANSHU MARATHE

In last six months we have examined 109 patients in our pain clinic.

Majority of the patients coming to pain clinic are of chronic head and neck cancer pain, abdominal cancer pain and radiation induced mucositis.

Majority of patients are managed with non-interventional pharmacological methods.

Interventions done till now - CT guided coeliac plexus block, C-arm guided Ganglion impar block, Lumbar epidural block (single shot as well as indwelling catheters).

What's new- A pilot study of sphenopalatine ganglion block by simple nasal instillation on local anesthetic. Patients with CA buccal mucosa are found to have good pain relief with this technique and it is easy to perform.

Currently a departmental study on " use of SPG block on intraoperative surgical stress response " is being planned

SURVIVORSHIP IN LONG TERM SURVIVAL OF CHILDHOOD CANCER

DR PANKAJ DWIVEDI

Five-year survival for many childhood cancers is more than 75% and there is a growing number of long-term survivors. Among the Childhood Cancer Survivor Study (CCSS) cohort, the overall all-cause absolute excess risk is 8.8 deaths per 1,000 person-years. Other than absolute increased risk of death, there are number of challenges post treatment. Neurocognitive, psychosocial, behavioural, heart-lung, endocrine and fertility issues are few of them. Second malignancies are life threatening consequences of previous chemotherapy or radiation. Now the focus of researchers is to reduce these toxicities without affecting outcome. There are established guidelines for monitoring and management of long term effects. Concept of ACT (after completion therapy) clinic is gaining wide acceptance. Modification of current protocols, early detection of side effect, regular follow-up and managing data of long term survivors are key to prevent and manage long term effects of cancer therapy.

QUOTE FROM NUTRITIONIST

MS GARGEE RAI

"The food you eat can be either the safest and most powerful form of the medicine or the slowest form of poison"

Diet is not all about how more or how less you have to eat or only about calories and protein, it's about healthy and right food choices to make to live a healthy life. We as a nutritionist help to educate patient to make right choices of food which contain all nutrients which will help them to fight against the disease and live a healthy diet

Challenging Rehab Cases

Cancer Rehabilitation is becoming more challenging as patients survive longer and therapies evolve. There is a need to create awareness about cancer rehabilitation. At NCI we have identified cancer rehabilitation as a core cancer treatment.

BLOG

Dr. Pradnya Pathak, Head, Department of Rehabilitation, NCI