Hemalata Bulletin

Issue i /January 2009

HEMALATA HOSPITALS AND RESEARCH CENTRE

Chairman's Message

I am happy that Hemalata Hospital has successfully completed three years in delivering comprehensive cancer care. It has become a centre of excellence for Cancer Treatment in Eastern India. The committed services of the team of dedicated specialists and staff of the hospital have resulted in us achieving his success.

The publication of Hemalata News is another milestone in our success. This will help us disseminate the information of the good work, both scientific and general, that we are doing.

I am sure it will help us reach the needy and also bind us together in our continued endeavour to deliver the best health care to the needy patients.

Dr. Arabinda Kumar Rath
Chairman and Managing Director

OUR ACHIEVMENTS SO FAR

Foundation Stone Laid : 28 April 2001
Our Patient Department Opened : 15 August 2005
Inauguration of the Hospital : 27 December 2005

OUR FIRSTS :

- First Digital Linear Accelerator in Eastern India.
- First and only 6 Slice / Second CT Scanner in Orissa.
- First corporate Hospital with Comprehensive Cancer Care in Eastern India.
- The only hospital in Orissa with Laminar flow and HEPA. Filtration system in Operation Theatre.

THE HOSPITALS CLINICAL ACHIEVEMENTS TILL DECEMBER 2008

1.	New cases registered	3125
2.	New Chemotherapy Patients	1235
3.	Radiotherapy Patients	806
4.	Surgeries	755
5.	Spiral Whole body CT scans	1728

Hemalata Hospital is now 3 years old

Dr. A.P.J. Abdul Kalam the then president of India Inaugurated the Hospital on 27th December 2005.

His Excellency Sri Muralidhar Chandrakant Bhandare, The Governor of Orissa visited the Digital Linear Accelarator and Awarded the 3rd Hemalata Oretion Award to Prof. Hari Shankar Shukla of Banaras Hindu University, Varanasi during the 3rd Annual Day Celebration.on 27th December 2008

HEMALATA HOSPITALS & RESEARCH CENTRE

Multi Specialty Hospital For Cancer & Neurosciences

Role of Intensity Modulated Radiotherapy (IMRT) in Precision Radiotherapy : A Case Study

Dr. Sanjib Kumar Mishra
Consultant Radiation Oncologist,
Hemalata Hospitals & Research Centre

A 50 year old gentleman, chronic smoker and tobacco chewer came to our hospital with history of swelling in the right side of neck since one year and mild dysphagia since last 6 month. On examination he was having good general condition with multiple right level – II & III lymphadenopathy. Per oral and direct laryngoscopic examination showed growth in the right pyriform fossa extending superiorly up to vellecula, inferiorly up to the level of vocal cord and medially up to the midline. There was fixation of right hemi– larynx. Biopsy from the primary lesion showed squamous cell carcinoma. CT scan showed 2.6 x 2 cm soft tissue mass lesion in right hypopharynx – PFS with extension in to right paraglottic fat and right lateral pharyngeal wall. FNAC from the neck node showed squamous cell carcinoma. So he was diagnosed as ca. PFS CT3N2bM0

He was planned for concurrent chemo-radiotherapy. Cisplatin was added to radiotherapy to enhance the effect of radiotherapy.

We planned for IMRT because we wanted to deliver maximum dose to the target area and at the same time we wanted to spare the spinal cord and both the parotid glands to reduce toxicicity like xerostomia. With IMRT we delivered 66Gy/30#/6week, radiobiologically which is more than 70Gy/35#/7week. So the treatment duration was also reduced by one week.

He received external beam radiotherapy to a dose of 66Gy/30#/42 days to gross disease at the primary and the nodal area and a dose of 60 Gy/30#/42 days to the microscopic disease at the upper neck (left side level- II & level- III node) by IMRT technique from 25.06.08 to 2.08.08 and to lower neck to a dose of 50 Gy/25#/5week. He tolerated the treatment well.

There is no evidence of tumor at the primary and the nodal site after 4 months of regular follow up.

Changing face of radiotherapy in last half a century

There is a paradigm shift in Radiation planning & delivery since 1960. Earlier it started with Tele Cobalt unit with two dimensional radiotherapy, where there were four lines over the skin. Now we are having four dimensional radiotherapy.

In 1980 Three dimensional conformal radiotherapy (3DCRT) came, where they delivered the dose, adequately and homogenously covering the target and tried to spare the normal tissue surrounding it. In 3DCRT they spared the organ at risk (OAR) in majority of the cases, but they failed where the organ at risk was very close to target or OAR was partially surrounded by the target. The best example is rectum (OAR) in prostate cancer, where the radiation beam is likely to damage the adjacent bladder and rectum.

By late nineties Intensity modulated radiotherapy came in to picture. It not only covers the target but also spares the OAR due to its varied intensity beam and sharp beam edge.

Then after 2000, image guided radiotherapy, sterotactic radiotherapy and tomotherapy came. The basic fundamental of all these techniques is to deliver the dose precisely to the target either by image guidance or by steriotactic frame immobilization.

Though these machines with high precision techniques are very costly but these are very effective in terms of tumor control and toxicity.

We are very lucky to have such a machine in Orissa at Hemalata Hospitals and Research Centre, Bhubaneswar.

Conformal radiotherapy techniques (3DCRT/IMRT) are very effective and less toxic in treatment of brain tumor, head and neck cancer, lung and esophageal cancer, Prostate & Cervix cancer, stomach & Rectal Cancer etc.

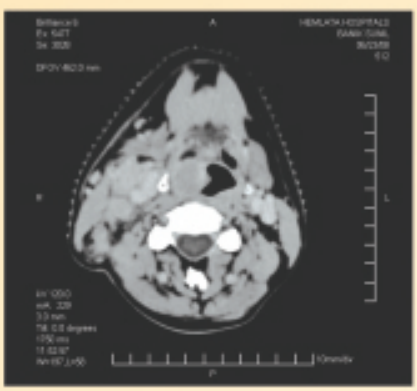

Fig. 1 : Pre IMRT CT section showing Primary Tumor and Metastatic Node

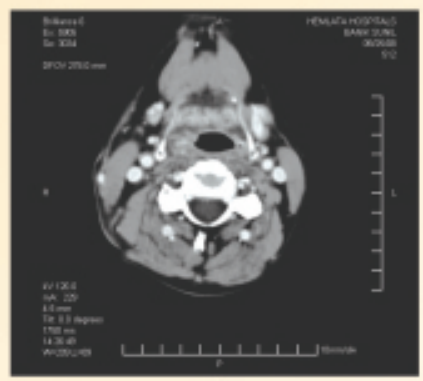

Fig. 2 : Post IMRT CT section showing complete response at Primary Tumor and Nodal Metastatics

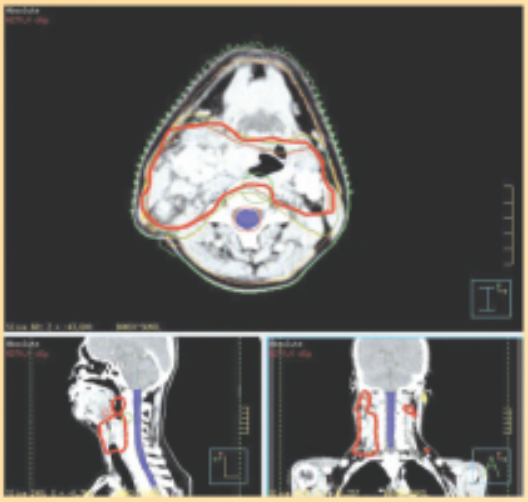

Fig 3 : IMRT Plan showing complete dose coverage to Tumor and Metastatic Node

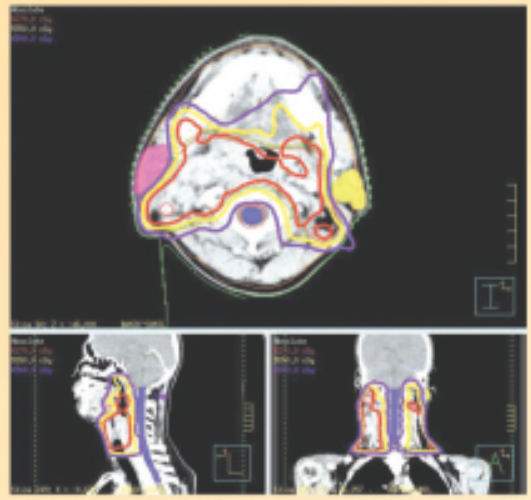

Fig 4 : IMRT Plan showing spacing of Parotid Gland and Spinal Cord

Role of IMRT in Head and Neck cancers

Now let us come to head and neck tumour where the target is very close to the parotid glands and spinal cord (OAR).

(A) Xerostomia is a very common late toxicity in head and neck radiotherapy due to radiation induced injury to salivary glands. The severity of xerostomia depends on the mean dose to parotid glands (1). It can be avoided by using IMRT where we can deliver the desired dose of radiotherapy to the target including the level- II node and at the same time we can spare the parotid glands(2).

(B) Since the target volume in conformal radiotherapy is less, the toxicities are also less and we can deliver the desired dose easily.

(C) Lee et al showed that there is improved loco-regional control in nasopharyngeal carcinoma treated with IMRT. The reason for that might be the dose per fraction. In IMRT while we are delivering 200cGy per fraction to the target, the dose received by the primary tumour will be around 220 cGy per fraction. This is called simultaneous integrated boost (SIB) technique which is radiobiologically superior. Chao et al also showed improved survival with IMRT.

(D) In nasopharyngeal cancer with extension to nasal cavity and para-nasal sinus tumours, the eye can not be spared without IMRT. Krasin et al showed that intensity-modulated radiation therapy for children with retinoblastoma can spare the bony orbit and there by prevent growth retardation of the bony orbit(3).

So for head and neck cancer IMRT is the answer if we want to have improved survival, reduced toxicity, even in post operative settings also.

Is IMRT Superior to conventional radiotherapy, radio-biologically?

Answer is "yes"

So in almost all the sites, conformal radiotherapy is always superior to conventional radiotherapy and in many sites like brain, head and neck and prostate cancer etc, IMRT is far superior to 3DCRT. The concomitant boost strategy (SIB) is a significant departure from conventional experience. It produces superior dose distributions and is biologically more effective.

References

1. Anke Petra Jellema et al "Does radiation dose to the salivary glands and oral cavity predict patient-rated xerostomia and sticky saliva in head and neck cancer patients treated with curative radiotherapy?" Radio-therapy and Oncology 77(2005) 164 – 171
2. CHING-YES HSIUNG et al "Parotid sparing IMRT for nasopharyngeal carcinoma:preserved parotid function after IMRT on quantitative salivary salivary scintigra-phy, and comparison with historical data after conventional radiotherapy". IJROBP 2006
3. KRASIN et al IMRT for children with intra ocular retinoblastoma' Clin Oncol 2004

OUR ONCOLOGY TEAM

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DEPARTMENT OF SURGICAL ONCOLOGY

Dr. Dillip Kumar Kar, MS, PDCC
Consultant, Surgical Oncology

Dr. Ranjan Mohanty, MS, FCS, FMAS
Consultant, Surgical Oncology

Prof. K.A. Dinshaw, Director Tata Memorial Hospital, Mumbai was the Chief Guest during the observation of World No Tabacco Day on 31st May 2007

Prof. S.K. Shrivastav, Head of the Dept., Radiotherapy, Tata Memorial Hospital, Mumbai and President Association of Rediation Oncologists of India delivered the 1st Hemalata Oretion on 27th December 2006

Prof. S.H. Advani, Eminent Medical Oncologist from Mumbai, delivered the 2nd Hemalata Oretion on 27th December 2007.

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