RAJIV GANDHI CANCER INSTITUTE & RESEARCH CENTRE

Newsletter

Vol. XVI No. 2 Price : 50 Paisa Issue : Feb. 2012

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EDITORIAL

FUTURE OF ROBOTIC SURGERY

Over the past two decades, robotics have revolutionized surgery and new innovations are continuing to push the boundaries of medicine. Trans Atlantic Surgery between USA and Strassbourg is a revolution in minimal access surgery. Professor Michael Gagner operated from 7000 km away. In this surgery, there was slight delay (66 milliseconds) in transfer of data but in future this delay will easily be minimized. The nature of robotic system makes the possibility of long distance intra operative consultation or guidance possible and may provide new opportunities for teaching and assessment of new surgeons through mentoring and simulation. Devices are being made (Socrates by Zeus) that will allow surgeons at remote sites to connect to an operating room and share video and audio, to use a telestrator to highlight anatomy and to control endoscopic camera. The voice controlled robot may replace the camera person and facilitate the performance of solo laparoscopic surgeon.

Technically much remains to be done before robotic surgery's. full potential can be realized. Although these systems have greatly improved dexterity, they have yet to develop the full potential in instrumentation or to incorporate the full range of sensory inputs. Robotic surgery may even be extended into the realm of advanced diagnostic testing with the development and use of US, near infrared (NIR) confocal microscopy equipment. The future of robots in surgery is limited only by imagination. Research is being conducted on systems to relay touch sensation from robotic instruments back to surgeon. Some researchers are working on sutureless anastomosis. One exciting possibility is expanding the use of preop. CT or MRI and intraop. video image fusion to better guide the surgeon in dissection and identifying pathology. These data may also be used to rehearse complex procedures before they are actually undertaken. Down the road as is with PC, the systems will become smaller, lighter, faster and easier to set up as this will increase their application.

There is ongoing research into micro machines – miniaturized robots that could be placed in patients' body to gather information or carry out medical procedures. Pill cameras may be swallowed by patients to provide images of their digestive system (micro robots). In the operating room of future, physicians will use tiny high tech tools to travel inside the body with dexterity and precision. The future operating rooms may be manless with robotic assistants, robotic scrub nurses and robotic technocrats.

When most people think about robotics they think about automation. The possibility of automating some tasks is both exciting and controversial. Future systems might include the ability for a surgeon to program the surgery and merely supervise as the robot performs most of the tasks. The possibilities for improvement and advancements are only limited by imagination and costs.

Dr. A. K. Dewan
Medical Director

RGCI&RC recognized for Fellowship in Urology Robotic Surgery by SIU, Montreal


Société Internationale d'Urologie

Rajiv Gandhi Cancer Institute & Research Center

Accredited Training Institute

RGCI&RC has become the first Indian institution to earn accreditation by the Societe Internationale d'Urologie (SIU), based in Montreal, Quebec, as Training Institute in Robot – Assisted Surgery. The accreditation allows RGCI & RC to participate in the SIU scholarship program for young urologists, which provides promising physicians early in their careers with three-month fellowships to develop laparoscopic and robot-assisted skills.

ROLE OF PET-CT IN BREAST CANCER : CURRENT RECOMMENDATIONS & EVIDENCE

Introduction

The landscape of oncologic practice has changed deeply during the past few years and there is now a need for imaging to provide accurate evaluation of morphology and function to guide treatment through a multidisciplinary approach. The emphasis is now on image guided therapy and increasing importance has been put on Positron Emission Tomography's (PET) role in various cancers among clinicians and patients despite a general context of healthcare expenditure limitation.

In this era of molecular imaging the focus is on the characterization of disease at a molecular level and the emphasis is on PET & PET-CT in various malignancies including breast cancer.

Diagnosis

X-ray mammography has been used since a long time for screening of breast cancer and detection in suspected cases. This has remained as the first line of investigation in the evaluation of breast cancer despite its limitations.

Glucose utilization by tumour both primary & secondary is the principle of imaging with 18F FDG (Fluoro-de-oxyglucose) in breast tumours. There is difference in glucose utilization in invasive carcinomas, lobular carcinomas and ductal carcinomas. This depends on the grade as well as pattern of spread in various types of breast malignancies. However in specific situations where cytological findings are equivocal and a decision regarding surgery in crucial, it is possible to characterise a palpable or mammographically detected breast lump as benign or malignant with precision.

Staging

Multiple imaging modalities are required to accurately stage breast cancer. These standard methods of staging overestimates or underestimates disease on most occasions. PET-CT can be added to improve detection of lymphnodal, distant or loco regional metastasis. It is also a preferred modality in patients with advanced stage disease and detects occult or unusual sites of involvement. PET is better in assessing the multifocality and multicentricity of disease than the conventional modalities. Extra axillary lymphnodes are better assessed with PET-CT. It also does away with the size criteria for detecting nodal disease and can accurately characterize a normal sized malignant lymphnode or an enlarged reactive lymphnode so much so that further therapeutic decisions can be influenced in 12% and upstaging or down staging by 10 – 20% as evidenced in literature. Upstaging or down staging can have an impact on management as well as prognosis or outcome.

Thus the main impact of PET-CT in staging of breast cancer has been the incremental value of adding this modality to conventional methods of staging and its role as a 'one stop shop' in the management of this disease.

Axillary dissection is an important procedure in the whole paradigm of breast cancer management.

The sensitivity of axillary lymphnodal detection is better in tumours which are > 3cm and sentinel lymphnode biopsy can be avoided in cases where PET-CT is positive. It should also be kept in mind that detection of lymphnodal involvement in levels or basins not covered by routine axillary lymphnode dissection can have major impact on treatment strategies. PET-CT has been found to be better than conventional modalities in detection of supraclavicular, (N3c) internal mammary and infraclavicular lymphnodal (N3a), involvement which may warrant a changed surgical approach. The detection lymphnodes of these basins are important in delineating RT planning zone as well.

Response evaluation

Assessment of treatment response is an important aspect in tailoring patient management strategies. Residual, even bulky masses, may remain after completion of standard treatment protocols. These may not regress totally even after adequate treatment because of fibrosis or necrotic debris. In such cases purely anatomic assessment criteria may often underestimate the chemotherapeutic effect which based on straight forward tumour measurements. Addition of metabolic imaging criteria to this is especially useful in identifying which of these patients have achieved satisfactory functional remission. It has been reported that glucose utilization of tumor is proportional to survival outcome. This can be assessed quantitatively a semi-quantitatively by PET–CT with measurement & comparison of standardized uptake value (SUV). Another important aspect of molecular / metabolic imaging is its ability to perform mid cycle or interim evaluation. This has clearly enhanced the ability to risk stratify patients of breast cancer. It has been reported across many studies that disease free survival is related to PET negativity. The outcomes depend not simply on whether the PET results have become negative but also on the rapidity with which it has happened. Thus outcomes can be improved by early interventions in suboptimal responders and can spare low risk patients form over treatment. Different studies are available in the literature which claim the utility of PET in monitoring response to treatment.

Surgically documented CR post NACT has substantial survival benefits. PET-CT serves as a surrogate marker of response and as a tool to optimize therapy. It can be used for early identification of treatment effectiveness by comparing glucose utilization as early as post 1-2 cycles of chemotherapy.

It has also been shown that breast tumors with low metabolic activity is likely to behave differently to standard treatment protocols as compared to other tumors. A PET guided treatment stratification for identifying the subset who will benefit from early treatment modifications have been proposed.

Metastatic disease

PET-CT is an important tool to detect metastatic disease in breast cancer. With the lowered age at incidence and more aggressive disease, metastasis can present in less advanced stage as well. PET-CT is highly sensitive in detecting pleural, mediastinal, abdominal and pelvic metastasis. In this setting PET-CT can provide correct assessment of disease to define treatment and improve decision making strategy. It accurately identifies metastatic sites and is more sensitive than

conventional imaging. Overall sensitivity and specificity for detection has been reported to be 90% & 81% respectively. PET can monitor and individualise therapy. Overall PET-CT serves as an important modality to assess response to treatment in the metastatic setting as well. It is well documented that it can predict response to therapy and hormone manipulation before any changes could be seen in conventional imaging thus allowing early treatment modifications if required. It has a strong co-relative predictive value to therapeutic response and can be used as an early detector of subsequent benefit.

Since reduction in metabolic activity co-relates with prolonged survival it may also serve as a surrogate end point to stop therapy. However it still needs to be seen whether it can improve outcome. The incremental values of PET help to identify high risk patients early and helps shaping individualized response adapted therapy.

Restaging

PET-CT has been found to have high sensitivity and specificity in restaging during follow-up after primary treatment. The high sensitivity in detecting recurrent / residual disease helps to correctly indicate the need for biopsy and more importantly to identify the proper site of biopsy within a lesion thereby increasing the positive yield. This can greatly alter management decisions. The use of PET-CT in routine follow up in asymptomatics is however not yet recommended.

Positron Emission Mammography (Breast PET)

Positron Emission Mammography (PEM) or Breast PET is the application of high- resolution PET technology to an isolated immobilized breast producing tomographic images of lesions with resolution down to 1.6 mm. This technology produces valuable clinical data on invasive and non-invasive disease across the continuum of care. From initial staging to ongoing post-surgical disease management the high-resolution PET scanner provides a metabolic perspective allowing physicians to provide optimal breast cancer care management. It can be combined with whole body PET study for complete disease evaluation or as a regional staging procedure in early stage breast cancer where a whole body metabolic imaging may not be indicated. High resolution PEM machines are available and in use in many centers across the globe.

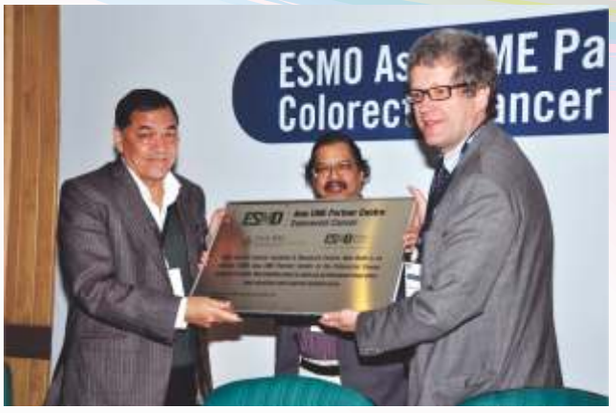
Conclusion

We have found effective use of PET-CT in initial staging mainly for high risk patients with incremental values including identifying a subset of patients with primary tumours with low metabolic activity which may require a different treatment strategy.

In our institute it has been helpful for better stratification for optimal treatment plans and its modification. It has been found to be the most objective way to evaluate ongoing management, also helping in accurate identification of an ineffective treatment protocol in a metastatic setting. In our experience and from the perspective of a practicing oncologist, PET-CT substantially improves the overall management of breast cancer.

Dr. Partha S. Choudhury
Director, Nuclear Medicine

ESMO Asia CME Partner Centre : Colorectal Cancer Program



ESMO Asia CME Partner Centre is the latest long-term education initiative from ESMO (European Society of Medical Oncology). Partnering with Asian cancer centres and hospitals, this initiative offers comprehensive continuing medical education (CME) and resources tailored to the specific educational needs of Asian oncology professionals. ESMO is the leading European professional organization, committed to advancing the specialty of medical oncology and promoting a multidisciplinary approach to cancer treatment and care. The partner program brings together the expertise of ESMO, national bodies, the Asia Scientific Committee, and various cancer institutions.

The program is a long-term education initiative from ESMO in partnership with 35 Asian cancer centres and hospitals from 12 countries. Of these, there are 5 centres in India including Rajiv Gandhi Cancer Institute & Research Centre (RGCI&RC).

First ESMO Asia CME Partner Centre : Colorectal Cancer Program was held at India Habitat Centre on 17th February 2011, in collaboration with RGCI&RC, Delhi and in partnership with Merck Serono Oncology. The CME began with the presentation of plaques to Mr DS Negi, Chief Executive Officer, RGCI&RC and Dr Shyam Aggarwal, Program Director, Sir Ganga Ram Hospital, New Delhi for becoming the partner centres in India.

Noted oncologists Prof. Eric Van Cutsem, Department of Digestive Oncology, University Hospital Gasthuisberg, Belgium; Dr. Dinesh Chandra Doval, Program Director, RGCI&RC, Delhi and Dr. Shyam Aggarwal, shared information on newer treatment standards for management of Colorectal Cancer. The program provided an East meets West platform for knowledge sharing and collaborations among the oncology professionals in Europe and Asia. It promotes CME in colorectal cancer management in oncologists and other professional within a multidisciplinary team; thereby, ensuring high-quality cancer care for the patients.

Dr. D.C. Doval
Director Research & Medical Oncology

RGCI & RC Cancer Jagrukta Abhiyan
Tallewal, Moga (Punjab) 17-2-2012

Posted at : Ashok Vihar Head Post Office, Delhi-110052
Registered with Registrar of Newspaper Under No. 68797/98
Postal Department Registration No. DL(N)/004/2012-14
Licensed to Post without prepayment under No.:"U"(DN)-162/2012-14

RGCI & RC organized one day Cancer Jagrukta Abhiyan at VPO Tallewal, Moga Punjab in association with Sahaita NGO on 17th Feb 2012. The program was attended by more than 600 people. Dr. J G Sharma and Dr. Indu Aggarwal delivered a lecture on cancer awareness & prevention which was very well appreciated by the audience. Team of Dr. J. G. Sharma, Dr. Indu Aggarwal, Dr. Sabina and Dr. Upasna screened more than 400 people. PAP smear tests were also carried out by RGCI Team.

RGCI & RC Team also gave 230 HPV Vaccinations to 11 to 19 year old females at no cost.

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Printed & Published by Mr. K. K. Mehta on behalf of Indraprastha Cancer Society & Research Centre and Printed at Raju Art Printers, 18-A, Old Gobind Pura Extn., Street No. 2, Parwana Road, Delhi-51, Tel. : 9871006333
Published from RGCI&RC, Sector-V, Rohini, New Delhi-110085 • Editor : Dr. A. K. DEWAN