Rajiv Gandhi Cancer Institute
and Research Centre
A Unit of Indraprastha Cancer Society
Registered under "Societies Registration Act 1860"

NewsLetter

Vol. XXV | No. 03 | Price: 50 Paisa

EDITORIAL

FUTURE OF HEALTHCARE – TECH ENABLED PATIENTS, HOSPITALS AND CARE GIVERS

Majority of people pay attention to health when they really get sick. Care givers in a hospital set-up attend to such patients generally with a two pronged strategy; (i) perform clinical examination and order some diagnostic tests to understand the underlying cause of the ailment and (ii) prescribe few medicines to take care of the health till the time the laboratory, radiology or pathology produces a detailed report. Doctor may then either continue the course of treatment or alter it based on the new knowledge acquired through these diagnostic reports. Barring a few chronic diseases, this episode is closed leaving clinical record to be retained and referred when the patient is brought to the same hospital again. This entire paradigm is tantamount to **Health Repair instead of Health Care.**

Emergence of innovative technologies is rapidly changing the entire ecosystem. People are seen wearing devices like fitbit, Goqii etc. These devices measure their daily steps walked, quality & quantity of sleep etc. and prompt them to record their water consumption, dietary consumption and many other activities to monitor their lifestyle. Several Smartphone apps are now able to measure and monitor various vital health parameters. Bluetooth enabled devices connected with smartphones now facilitate monitoring of such parameters without any active human intervention. ECG, Blood Pressure, Pulse, Oxygen Saturation etc. could be monitored through such devices. These devices are getting miniaturized and increasingly affordable. This trend is set to accelerate.

Connected Care

Hospitals are investing in technologies that bring patients under remote monitoring by tapping into the data collected by such wearable devices and generate alerts when certain parameters become abnormal requiring active clinical intervention. For example, in the event of detecting a heart attack, ambulance equipped with lifesaving facilities could be scrambled to patient's location and active treatment can start there itself under remote guidance of an expert sitting inside the hospital.

This concept of data capturing, sending to central repository, processing and signaling alerts form part of concept called Internet of Medical Things (IoMT).

Imaging Systems are also being endowed with communication capabilities so that medical images can be directly sent to a central imaging repository (a Picture Archival & Communications System, PACS). The PACS allows for easier handling of medical images and makes them available to a physician on demand, and remotely.

Smart hospitals are going to be part of an integrated, interconnected ecosystem that includes government data platforms, population health agencies, payers as well as other providers. Data sharing among entities (to the extent permissible by law) is crucial to ensure that patients receive high quality healthcare efficiently and conveniently.

Robotic Telepresence

Hospitals have been using Robotic Process Automation (RPA) for some time now, but these areas have mostly been limited to operational aspects only. However, robotics holds promise in several key patient care areas. One such emerging area is Robotic Telepresence. One of the complaints about a conventional hospital setup is the painfully long wait time. In emerging countries, and in rural locales, the wait time for even a basic check-up or a follow-up could be hours. The loss of productivity, patient and physician frustration, and operational chaos in the hospital during this time can all be alleviated using robotic telepresence systems. These systems connect the patients with the physicians virtually. A physician need not be present in a hospital or clinical setting for periodic checkups; similarly, a patient can videoconference physicians at predetermined times. This will help improve hospital efficiency.

Clinical Decision Support System (CDSS)

Errors are not uncommon in healthcare delivery setup. Medication errors, surgical site errors, hospital acquired infections etc. are unfortunate realities. There are several stakeholders in a care delivery system including doctors, nurses, paramedics, phlebotomists, pharmacists, dieticians etc. and care delivery workflow passes through several stations and several individuals. Any communication gap at any stage could cause undesired effect on the outcome. Electronic health record systems are increasingly being used to minimize or eliminate this communication gap ensuring necessary and sufficient data capture and avoidance of verbal instructions.

Information systems are becoming increasingly smart as a myriad of data is collected through wearable devices (vital parameters), investigation reports are available with trends of results (e.g. CBC, LFT, Lipid Profile, KFT, TFT etc.) and once aggregated for several thousands of patients, it is becoming easy to pinpoint the exact health condition of the patient. IT is bringing research at the doorstep of clinicians. Concerned research papers pop-up based on the specific health condition and point the clinician to the latest protocols being followed as best practice. Advanced diagnostics e.g. Next Generation Sequencing (NGS) further helps selecting precision medicines and personalized medicines. Doses are calculated based on the approved formulae and in case of a prescription above or below tolerance range, system generates an alert of overdose or under-dose. Equipped with predictive analytics, these CDSS systems are becoming increasingly productive and will enhance clinical outcomes significantly in terms of speed and accuracy of clinical decisions.

AI enabled Diagnostics

Deep neural networks can help diagnose a range of diseases by image analysis, and research suggests that the AI now has a diagnostic accuracy rate to that of human physicians.Using advanced Machine Learning algorithms, CT and MRI images can now be analyzed to detect cancer cells using texture analysis to the level of accuracy that could otherwise come from microscopic examination of the tissues after biopsy. AI is bringing Radiology and Pathology to a much greater convergence. Future of the diagnostics seems progressing very much on this line.

Continued on Page No. 4

MAXIMISING' EXTENT OF RESECTION MATTERS A LOT IN GLIOBLASTOMA MANAGEMENT

Glioblastoma is the most common malignant primary brain tumor in adults and is known for its invasiveness, aggressive behavior and high relapse rates. Dating back to Dandy's era, investigations on the best surgical procedures to maximize treatment outcome in gliomas have been spanning for almost 100 years. Based on the concept of obtaining tissue sample for definitive diagnosis and reducing intracranial pressure, biopsy remained the main purpose of surgery in the middle to late twentieth century which was performed by either burr-hole or craniotomy. As more evidence surfaced supporting the positive correlation between resection and survival, gross total resection came to the scientific community attention. Now, maximal safe resection of glioblastoma as the first step of standard therapy is an accepted treatment strategy in malignant glioma surgery, and more evidence has elucidated a positive relationship between surgical resection and survival.

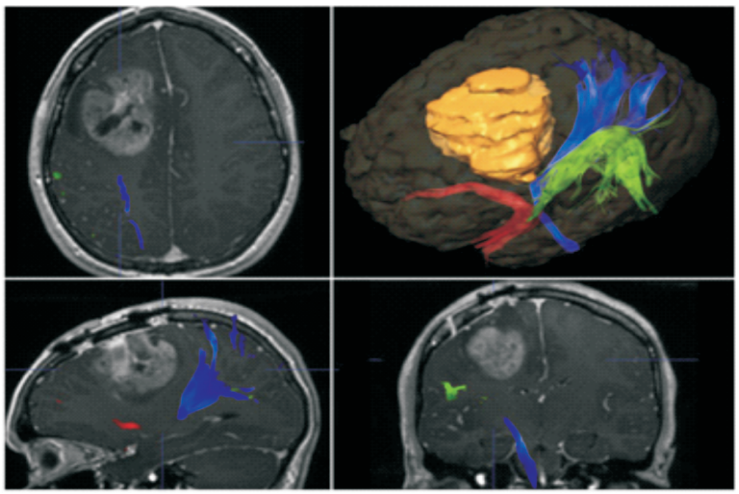


Fig. 1

With the advent of computed tomography (CT) and magnetic resonance imaging (MRI), neurosurgeons have been able to localize the tumor preoperatively, dramatically improving surgical accuracy and lowering morbidity and mortality. Moreover, the amount of tumor mass removed is no longer an approximate estimate of the neurosurgeons. In addition to this, evolution of advanced MRI techniques and algorithms like functional MRI, perfusion imaging, diffusion tensor imaging/ tractography, treatment response assessment maps (TRAMs) etc. (Fig.1) have really made a difference in assessment and resection of glioblastoma.

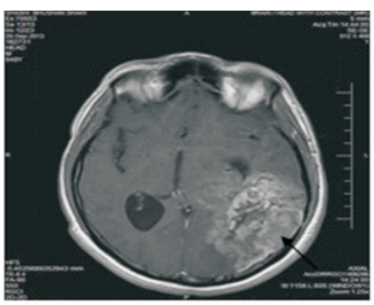
Initially, Lacroix et al. introduced the novel concept of a maximum extent of resection (EOR) and reported that resection of 89% or more of the tumor volume was necessary to obtain significant survival improvement after surgery, while resection of 98% or more of the tumor volume is a significant independent predictor of survival. In another study, Sanaiet al. demonstrated in their study that as little as 78% EOR resulted in a significant survival advantage. In another paper, Orringer et al. showed that EOR is significantly affected by tumor location, size, and neurosurgeon's expertise.

The concept of maximum EOR has stimulated active research and lead to several other publications on the relationship among gross total resection (GTR), residual volume (RV), and survival. In a large meta-analysis, it has been found that patients with newly diagnosed glioblastoma undergoing gross total resection(GTR) are 61% more likely to survive 1 year ,19% more likely to survive 2 years, and 51% more likely to be progression free at 12 months compared with patients receiving only an subtotal resection (STR).

In recent years, some new tools and techniques have been implemented to safely achieve GTR and to improve surgical results, such as fluorescein-guided techniques, awake craniotomy, intraoperative ultrasonography, intraoperative MRI (iMRI), intraoperative cortical stimulation/ mapping and neuronavigation with functional MRI (fMRI). In the past few years, fluorescein sodium- and 5-ALA-guided techniques have been reported in many institutions to be effective for maximal safe resection of GBM and for prolonging the patients' progression-free survival.

Fig. 2

Of particular interest is the fact that the use of preoperative fMRI and neuro navigation (Fig. 2) has improved maximal safe resection of glioblastoma and prolonged median survival time to 20.7 months in literature. However, brain shift is an intrinsic difficulty in the use of neuronavigation, which result from patient's positioning, dural opening, cerebrospinal fluid (CSF) loss, residual tumor volume decreasing, and peritumoral edema. It can be overcome by intraoperative MRI and intraoperative ultrasound. Intraoperative ultrasound is relatively inexpensive tool compared to iMRI and is convenient to account for brain shift, predict residual tumor, and visualize vascular relationships to tumor.Intraoperative ultrasound is an operator-dependent technique, so the learning curve for the technique can be steep and the level of experience in its use can affect image quality, orientation, and interpretation.



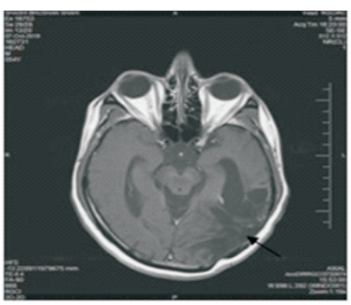


Fig. 3 Left Temporo-occipital glioma pre-op MRI

Post opMRI Brain showing excellent removal

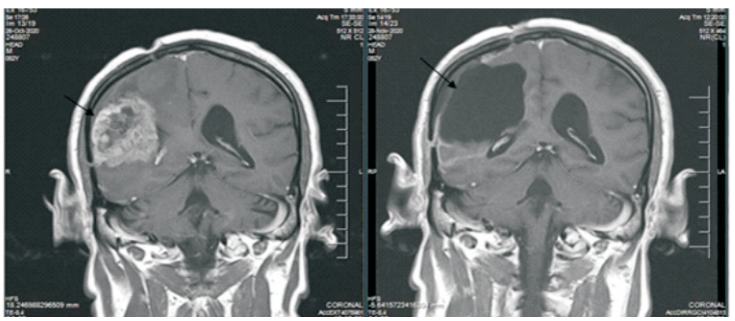


Fig. 4 Pre-op MRI of right parietal glioblastoma

Post-op MRI showing gross total removal

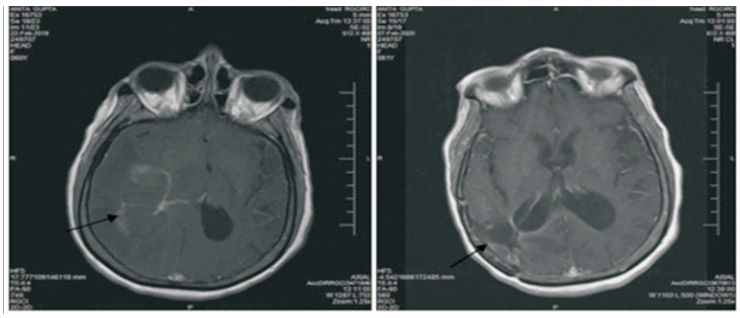


Fig. 5 Right posterior temporal glioblastoma pre-op MRI Post-op MRI showing maximal removal

In conclusion, maximal safe resection (Fig. 3, 4 & 5) should be the aim of glioblastoma surgery to pass on the survival benefit to the patients. Experience has proven that such surgeries should be performed at dedicated neuro-oncology centres where most neurosurgical gadgets/adjuncts and necessary expertise is available so that required balance between maximal resection and safety is maintained.

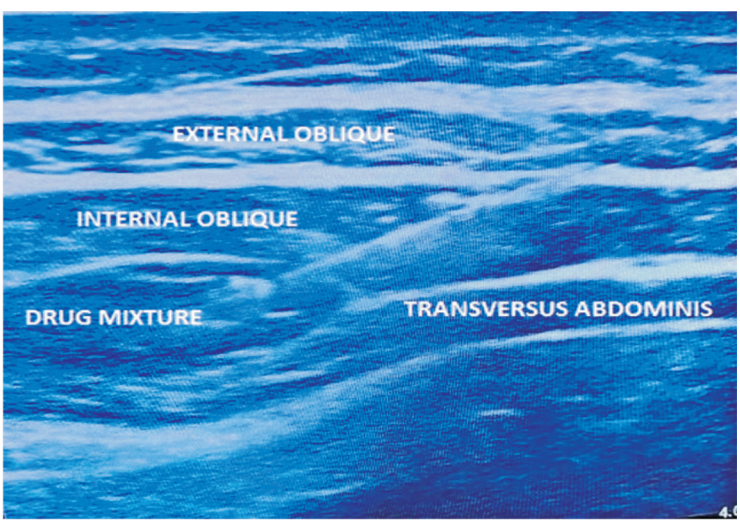
Dr. Ramandeep Singh Jaggi
Sr. Consultant and Unit Head
Neurosurgical Oncology(Brain and Spine)

Rajiv Gandhi Cancer Institute & Research Centre, Niti Bagh, South Delhi

TRANSVERSUS ABDOMINIS PLANE (TAP) BLOCK NEUROLYSIS FOR ABDOMINAL WALL PAIN IN CANCER

Pain is a common symptom associated with cancer. It is treated all over the world by using the WHO analgesic ladder approach and opioids along with some adjuvants remain the mainstay of treatment for cancer pain management. There are a few subset of patients who have progressive disease and continue to have pain despite heavy doses of analgesics. Such patients are treated with the help of regional nerve blocks/sympathetic neurolysis/epidural injections under image guidance. Recently a new subsection of regional blocks have been added to these categories which are known as field blocks. Transversusabdominis plane block is such a field block which initially had its utility for acute post-operative pain management in various types of surgeries, including different abdominal surgeries with accompanying laparotomy (including major abdominal surgeries), hernia repair, and cesarean delivery. Now it is being used for chronic cancer pain management too in cases where the patient is having intractable abdominal wall pain.

TAP block is given in the fascial plane between the internal oblique and the transversusabdominis muscle which is said to provide blockade to the mid/lower thoracic and upper lumbar spinal nerves too. Various approaches to TAP plane have been described in literature but commonly used ones include subcostal and lumbar triangle of Petit. These can be supplemented with rectus sheath block which acts on the terminal branches of the 7–11th intercostal nerves, penetrating the posterior wall of the rectus abdominis muscle thus providing a better coverage of sense organs near the midline of abdomen relative to TAP block.[1] Lee KH et al and Hung CJ et al utilized TAP block for palliation of intractable abdominal wall pain and incorporated 33% alcohol in it to increase the duration for pain relief.[2,3]



TAP neurolysis with alcohol can be done for palliative patients who have a multitude of symptoms and suffering from abdominal pain as a result of disease as well as some remedial procedures. It can be used for pain due to ascites, pig tail site pain, metastasis to abdominal wall and gastrostomy/feeding jejunostomy site pain. Efficacy of the procedure can be increased by performimg it under real time ultrasound guidance. By doing low concentration alcohol neurolysis in the TAP plane the duration of pain relief can be extended up to 17 days to 6 months. It is a simple day care procedure which is being done under local anaesthesia and is said to provide stability to the opioid consumption in palliative patients by providing analgesia to the anterior abdominal wall.

1. Yarwood J, Berrill A. Nerve blocks of the anterior abdominal wall. Continuing EducAnaesthCrit Care Pain 2010; 10: 182-6.
2. Lee KH, Kim DH, Kim YH, Ro SH, Lee J. Neurolytic abdominal wall blocks with alcohol for intractable gastrostomy site pain in a cancer patient – a case report. Korean J Anesthesiol. 2020;73:247-51.
3. Hung JC, Azam N, Puttaniah V, Malhotra V, Gulati A. NeurolyticTransversus Abdominal Plane Block with Alcohol for Long-Term Malignancy Related Pain Control. Pain Physician 2014; 17:E755-60.

Dr. Sunny Malik
Consultant In-Charge
Department of Anaesthesia, Pain and Palliative Medicine
Rajiv Gandhi Cancer Institute & Research Centre (RGCIRC),
Niti Bagh, South Delhi

Date of Printing: 25th March 2021

Date of Publishing: 30th March 2021

Posted at: Ashok Vihar, Head Post Office, Delhi - 110052
Register with Registrar of Newspaper Under No.68797/1998
Postal Department Registration No. DL(N)/004/2021-23
Licensed to Post without Prepayment Under No.: "U"(DN)-162/2021

EDITORIAL (CONTD.)

Breaking New Frontiers

Use of Robots in ICU and Operation Theatres is being contemplated and is even being experimented. As early as 2015, surgeons affiliated with Florida Hospital Nicholson Center (Celebration, Fla.) used a surgical robot system to simulate telesurgeries. The team successfully performed surgeries on a simulator that was located in Texas- more than 1200 miles away. A surgical team at St. Joseph's Hospital Hamilton in Ontario, has a better story to tell; it has operated on actual patients located hundreds of miles away, performing biopsies and minor surgical procedures through remote control of surgical robots.

While hurdles in the wide-scale adoption of telesurgery had been attributed to technical uncertainties that could affect real-time control and patient safety, these pilot studies have shown that the biggest hurdle today is psychological.

The Road Ahead

Hospitals have long been reluctant to adopt emerging technologies and practices, primarily due to the high investment involved. However, with the cost of technology falling sharply, and fast developing digital connectivity, hospitals will now be forced to embrace new technologies. Besides helping patients, these changes will benefit the hospitals themselves by digitizing asset tracking, personnel management and scheduling for better operational efficiency.

In the distant future, patients may well end up not going to hospitals, instead having all services performed from a distance. That could be the future of hospitals!

Dr. A. K. Dewan
Director - Surgical Oncology

J. P. Dwivedi
Chief Information Officer

CME – IMA DWARKA

RGCIRC organized a CME in association with IMA Dwarka on Saturday, 06th March 2021 at Hotel Radisson Blu, Dwarka, New Delhi. Dr. I. C. Premsagar, Sr. Consultant and Chief of Neuro & Spine Surgery delivered a lecture on Clinical Presentation of Central Nervous System (CNS) Tumors, Dr. Abhishek Bansal, Consultant – Interventional Oncology spoke on Interventional Oncology: Pin-Hole Treatment Options and Dr. Himanshu Rohela, Consultant - Orthopaedic Oncology spoke on Challenges in Orthopaedic Oncology. The CME was very well appreciated by the gathering.

To:

_____

_____

_____

_____

_____

If undelivered please return to:
Rajiv Gandhi Cancer Institute and Research Centre, D-18, Sector - 5, Rohini, Delhi - 110085

Printed and Published by Mr. Pramod Maheshwari on behalf of Indraprastha Cancer Society and Research Centre and printed at R. R. Enterprises, 18 - A, Old Gobind Pura Ext., Street No. 2, Parwana Road, Delhi - 110051, Tel: +91 - 8447494107, Published from Rajiv Gandhi Cancer Institute and Research Centre, D - 18, Sector - 5, Rohini, Delhi - 110085

Editor: Dr. A. K. Dewan