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EDITORIAL

ARTIFICIAL INTELLIGENCE – PARADIGM SHIFT IN HEALTHCARE!

Artificial Intelligence (AI) in health represents a collection of multiple technologies enabling machines to sense, comprehend, act and learn, so they can perform administration and clinical healthcare functions. **AI** today can truly augment human activity taking over tasks that range from medical imaging to risk analysis to diagnosing health conditions. With immense power to unleash improvements in cost, quality and access, AI is exploding in popularity. Growth in AI health market is expected to reach $6.6 billion by 2021 – that is compound annual growth rate (CAGR) of 40%.

AI is where computers perform tasks that are usually assumed to require human intelligence. Computers can recognize images, speech and process natural languages. Question is "should **AI** take the place of humans? If so, then to what extent?" My friends might say that medicine is an art with human element. AI cannot replace it. I agree with this statement. But AI will benefit healthcare through amplification of human intelligence, intuition, creativity and judgement rather than replacing humane element of human beings.

AI can use myriad of special kind of information known as big data – plucked from a massive data set. Relationship between big data and **AI** is like nail and hammer. **AI** is the tool – the hammer needed to put big data – the nail – in its place to fix a problem. By itself, big data is simply a massive amount of information. Unless it is analyzed one cannot determine the meaning and relevance of the data. With big data AI may ultimately predict longevity of patient's lives, monitor population health registries or even predict outbreaks.

AI in medical imaging specially diabetic retinopathy and dermatology have been put in clinical use. Many diseases of the eye can be diagnosed through non invasive imaging of retina through the pupil. Early screening of diabetic retinopathy is important as early treatment can prevent blindness. Such screening needs fundus camera with several images taken at different orientations after pupillary dilatation and skilled interpreters. With advent of digital photography digital recording of retinal images can be carried out through PACS (Picture archiving and communication systems). Automated retinal image analysis using deep learning algorithms have produced sensitivity and specificity of more than 90% similar to manual assessments. Same way skin cancers have been evaluated using a convolutional neural network (CNN) algorithms with striking results.

AI thinks and pays for itself. Cognitive robotics can integrate information from preop. medical records with real time operating metrics to physically guide and enhance the physician's instrument precision. The technology incorporates data from actual surgical experiences to inform new, improved techniques. Such improvements enhance overall outcomes and consumer trust for **AI** applicability across surgical practice. According to literature such Robotics may reduce length of stay by 21%. Robotic technology in future may replace human surgical Assistants by programming into robot what was previously done by surgical assistants. Virtual nursing Assistants remotely assess patient's symptoms and deliver alerts to doctors only where patient care is needed, it may reduce unnecessary hospital visits.

The nature of work and employment is rapidly changing and will continue to evolve to make use of both humans and **AI** talents. **AI** can fill in gap around the rising labor shortage in healthcare. **AI** has the power to alleviate burden on clinicians and give workers tools to do their jobs better. Even healthcare organizations should build an AI smart workforce and culture that will use **AI** to enhance efficiency, quality and outcome for patients.

Unfortunately most hospital administrations lag behind other professions and industries in their use of analytics when it comes to running their operations. **AI** can impact on clinical decision making, patient diagnosis, hospital/physician workflow and drug delivery system etc.

AI is not an innovation coming down the pike – it is here. It is in our call centers, our homes and now, in our healthcare. Those who seize this AI opportunity and embrace these applications to deliver high quality, cost effective care will be the ones to leapfrog competitors.

A word of caution – keep in mind that AI and computers are tools. We still need people with human touch to deliver the care and be the final arbiter of what is best.

Dr. A. K. Dewan
Director - Surgical Oncology

Acknowledgement – Inputs by
Mr. J. P. Dwivedi
Chief Information Officer
RGCIRC

ROBOTIC THYROIDECTOMY – A NEW WAY FOR SURGICALLY TREATING THYROID NODULE/ EARLY THYROID CANCER WITH NO VISIBLE SCAR

We have come along way since Moorish physician Albucasisin had successfully removed goitre under sedation with opium with the use of simple ligatures along with hot cautery irons as the patient sat with a bag tied around his neck to collect the blood from the wound in 952 AD. The thyroidectomy was associated with 40% mortality. Hence in 19th Century , The French Academy of Medicine banned thyroid operations in 1850 due to the high mortality associated with them. Thyroid surgery started coming out of its doldrums in the middle of the nineteenth century. This was due to the concerted improvement in anaesthesia, infection prophylaxis and better haemostasis. Between 1877 to 1881, Billroth was able to decrease the mortality to 8.3%. Theodor Kocher, a pupil of Billroth, carried forward the baton of thyroid surgery from his teacher. This brought down the mortality to 2.4% by 1895, the mortality rate decreased to about 1%. In 1909, Kocher was awarded the Nobel Prize for the work done by him on thyroid surgery.He laid down the principles of thyroidectomy performing more precise “extracapsular dissection”. Halsted and Evans in 1907 described the the blood supply of parathyroid glands and opined that **'ultraligation'** of the thyroid arteries distal to the points of origin of the parathyroid artery branches or close to the thyroid capsule to preserve parathyroids. These principles were laid in the beginning of the century.

The incisions taken during the 1850s,were undertaken via longitudinal, oblique, or vertical neck incisions. Jules Boeckel of Strasbourg introduced the collar incision in thyroid surgery in 1880, and this approach was popularized by Theodore Kocher. Since then transverse cervical incision along the skin crease is used to perform thyroid surgery. The neck scar can be ugly, so remote access approaches to perform thyroidectomy were being developed to hide the scar.

Minimally invasive surgery (Laparoscopy) was introduced in late 1980s for majority of abdominal surgeries with decreased hospital stay. As the incidence of thyroid nodule is more in females who are usually young and who would like to avoid visible scar on the neck. In minimally invasive approach was attempted in thyroid surgery also. The first endoscopic thyroidectomy was first performed in 1997, introducing the era of remote-access approaches for thyroidectomy (Endoscopic Thyroidectomy). Several remote-access approaches have been attempted to place the incision in a more favorable location, including breast, axillary, face-lift, and transoral approaches for hiding the scar. The prolonged learning curve necessary for remote access without wristed instrumentation has led to adoption of robotic instrumentation.

The Da Vinci robotic system (Intuitive Surgical, Sunnyvale, California) was first utilized for transaxillary thyroidectomy by Chung in 2007.

South Koreans have pioneered in robotic thyroidectomy via **transaxillary** and **facelift or retroauricular** approach. Robotic system helped to overcome some of the limitations of the endoscopic procedures such as reduced range of motion, and impaired eye-hand coordination (while relying on an unstable 2-dimentional view). Because of this, robotic thyroidectomy has become increasingly popular around the world attracting both surgeons and patients, searching for new and innovative procedures and allowing for the removal of thyroid glands with a superior cosmetic result when compared to the conventional open thyroidectomy procedures. Many studies have described the safety of the remote-access robotic thyroidectomy procedures and have demonstrated comparable oncologic outcomes between the robotic and open conventional thyroidectomy.

Patient Selection: In general, the best candidates are nonobese (body mass index $\leq$30) young patients, without comorbidities or advanced disease, with a history of keloid or hypertrophic scar or otherwise motivated to avoid a cervical incision. The remote-access approaches are usually deferred in patients with a previous history of neck surgery or irradiation of the neck. The thyroid nodule size should be less than or equal to 4 cm with no extrathyroidal extension and no cervical lymph nodes.

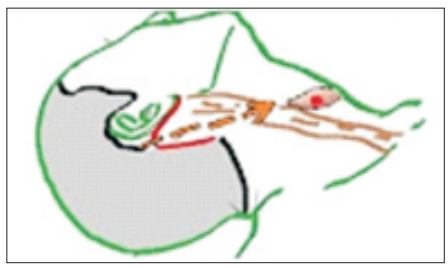

fig 1

We routinely perform robotic retroauricular thyroidectomy at our institution. We have two Da Vinci robots at our centre Si and Xi. We will share one of our recent cases, 20 year old euthyroid female with left thyroid nodule. Ultrasound Guided FNAC showed suspicious? papillary cancer. The ultrasound neck showed well defined left thyroid nodule of 3.5 x 4 cm with no cervical lymph nodes. The patient was young and opted for robotic left hemithyroidectomy via retroauricular approach (using Da Vinci Xi robotic system). The incision was placed behind the ear and 1cm inside the hairline (as shown with redline in Fig 1), skin flap is raised in subplatysmal plane crossing midline and inferiorly upto the suprasternal notch. Chung's self retaining retractor is placed to keep the skin flap retracted. Robotic instruments (prograsp, Maryland and monopolar scissors) with 30 degree camera were docked with one assistant. Console phase was started with elevation of strap muscles and exposure of thyroid lobe. The superior pedicle was cauterized close to thyroid lobe. The parathyroid and recurrence was indentified and preserved. Thyroid isthmus cut with cautery after mobilization of thyroid from trachea. The specimen was sent for frozen section which

fig 2 fig 3

showed no evidence of malignancy. The patient was shifted to ward on the same postoperative day evening and was discharged on 2nd postoperative day. The patient achieved excellent cosmesis with this advanced robotic retroauricular thyroidectomy (as shown in Fig 2 & Fig 3). The other head & neck robotic procedures that can be performed are trans oral robotic surgery for oropharyngeal and supraglottic cancer and retroauricular robotic neck dissection with good cosmesis and much reduced morbidity.

Dr. Mudit Agarwal
Sr. Consultant – Head & Neck Surgical Oncology

WORLD NO TOBACCO DAY 31ST MAY 2018

For this year campaign, Month of May 2018 was special for RGCIRC for creating awareness and harmful effects of Tobacco, RGCIRC Organized awareness programs in various schools in Rohini and Pitam Pura nearby RGCIRC, Talks Delivered by Dr. Jai Gopal Sharma and Dr. Indu Aggarwal.

On 31st May RGCIRC offered Free Oral Screening for public for 2 weeks and 101 persons was screened in the event.

A study conducted by WHO and the Health Ministry had revealed that 76% of Indian movies had tobacco use and 52% of children in India, who had their first smoke were influenced by tobacco use depicted in movies.

The Ministry of Health and Family Welfare notified that all tobacco products should have 85% pictorial warnings to be effective from 1st April 2014. However the parliamentary panel on subordinate legislation termed the government move as too harsh and recommended 50% pictorial warning on all packets of tobacco products. However the recommendations of the committee were not binding on the health ministry.

On 4th May 2016 a bench of two judges in Supreme Court, gave in its order that the manufacturers had a duty to inform people about the harmful effects of tobacco. The supreme court directed tobacco manufacturing firms to comply with a 2014 rule and display warnings across 85% of the surface of packets of cigarette and other commodities till the validity of the law is decided by the court, passed the order on a batch of petitions filed by the manufacturers challenging the rule.

Dr. J. G. Sharma and Dr. Indu Aggarwal
Preventive Oncology Department

CME – IMA HISAR

RGCIRC organized a CME in association with IMA Hisar on Saturday, 19th May 2018 at Midtown Grand, Hisar, Haryana. Dr. A. K. Dewan, Director – Surgical Oncology delivered a lecture on Oncology – What a Physician Needs to Know? and Dr. Gurudutt Gupta, Sr. Consultant & Head – Histopathology spoke on Role of Laboratory Services in Management of Malignancy in the said CME.

CME – IMA AMRITSAR

RGCIRC organized a CME in association with IMA Amritsar on Friday, 25th May 2018 at IMA Hall, Amritsar, Punjab. Dr. Gauri Kapoor, Medical Director - RGCIRC, Niti Bagh & Director - Pediatric Hematology Oncology delivered a lecture on Recent Advancements in Management of Malignancy and Dr. Sumit Goyal, Sr. Consultant – Medical Oncology spoke on Lumps, Bumps & Masses: When to Suspect Malignancy in the said CME.

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DELHI STATE WOMEN DOCTOR'S CONFERENCE

RGCIRC participated in Delhi State Women Doctor's Conference and National Convention on Menstrual Hygiene organized by Delhi Medical Association (DMA) on Sunday, 27th May 2018 at DMA House, Darya Ganj, Delhi. The theme of the conference was Women Health & Womanhood. Dr. Rupinder Sekhon, Sr. Consultant and Chief of Gynae Surgical Oncology delivered a lecture on Cancer in Women in the said conference.

CME – IMA VARANASI

RGCIRC organized a CME in association with IMA Varanasi on Saturday, 2nd June 2018 at Hotel Clarks, Varanasi, UP. Dr. Mudit Agarwal, Sr. Consultant – Head & Neck Surgical Oncology delivered a lecture on Surgical Management of Well Differentiated Thyroid Cancer and Dr. Sajjan Rajpurohit, Consultant – Medical Oncology spoke on Recent Advancements in Management of Gynaecological Cancers in the said CME.

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