



# NEWS LETTER

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## EDITORIAL : CYBER THREATS AND VULNERABILITIES – ESCAPE TO NOWHERE?

You might have come across the cases where

- A sender of an e-mail or SMS or WhatsApp says “Your electricity will be disconnected if you don't pay Rs. 9500 immediately”.
- Someone calls and tells you “your son is under our custody for rape charges” and demands Rs. 5 Lacs to be deposited by you in a particular account. The caller will not give you time to think.
- A lady is at home and receives a call that her husband has met with an accident and some emergency procedure needs to be carried out. Rs. 2 Lacs are immediately required to be transferred to such and such account. The caller even makes her listen to the voice of her husband.

These are some of the cyber-crimes with increasing degree of sophistication. These people who commit such crimes are called threat actors. These actors collect sensitive information through various sources and use it for their purpose. The sharpness of attack depends on how specific is the information possessed by them.

In first case above, they just need a directory of mobile numbers of people working in an organization or living in a society building. They will select a few targets either randomly or based on some more inputs about usual electricity bills. In the second case, the caller has a specific information about the name and age of your son and knows enough about you and your spouse on your ability and inclination to cough up the money under this situation. The third case is much more sophisticated. The caller knows all about your family. About your and your wife's routine of life. He also has your voice samples and is able to produce the sentences using AI. This is called 'impersonation'.

### How do they collect all this information about you?

There are some easy ways and some not so easy ways. If you are careless and you throw or leave unattended important records like your electricity or mobile bills, medical records including Lab / Radiology reports, Income Tax related documents, society maintenance charge receipts etc., you become an easy prey. These could be picked up by such actors and used to do data mining about you. You freely share your Aadhar card, Voter id card or Driving licenses, they pick-up and strengthen their data bank further. They can steal your identity by acquiring such information. They can hack into your e-mail account, mobile etc. They can get the mobile number changed in the Bank Records or Aadhar Card or PAN Card and later on use it to receive OTPs.

### Advanced Techniques

These threat actors are now equipped with various

advanced techniques to collect data about individuals. Some of these techniques are listed here:

#### Phishing

Phishing is an age old technique of data collection. Phishing means revealing some information about the target upfront so that the target gets confidence and reveals the remaining information to the attacker. The attacker sends a fraudulent e-mail or text message from a seemingly trusted individual or organization. The aim is to persuade the recipient to open an attachment that will enable an attacker to obtain login information and infect the IT infrastructure with malware.

#### Social Engineering

Social engineering makes use of personal information provided by the victim on social media. People share a lot of personal information on platforms like Facebook or Instagram without thinking that this could be misused. The attacker mines such information and uses it for Phishing, Impersonation or other forms of attacks.

#### E-mail spoofing and impersonation

You might have witnessed the cases where a CFO receives an e-mail from the CEO to transfer a large amount of money to a particular amount. The e-mail presents urgency and exigency to such an extent that the CFO gets tempted to comply without thinking further. If you look at sender's e-mail id carefully, you will be able to figure out that this is a different person but often people neglect finer details.

#### Key Logging

Once the attacker gains access to the IT infrastructure of the victim, a malicious software is installed on victim's computer and this software records each and every keystroke pressed by the user using keyboard of the computer. The attacker effectively uses it to steal passwords and other sensitive information.

#### Actions of Threat Actors

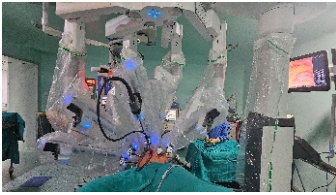
Once this threat actor gains access to the IT infrastructure of the victim, the following actions may follow:

- **Passing information to interested parties** – This is called an act of Trojan Horse. The malware does not actively harm other than stealing sensitive information and passing on to the attacker.

- **Placing information in Dark Net for selling** – The attacker steals the sensitive information and places in cyber space called 'dark net'. Normally a small portion of data is placed

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## ROLE OF ROBOTICS IN GYNAE ONCOLOGY



Surgeries for gynecological malignancies were conventionally performed by open laparotomy.

With the advent of laparoscopy, some of these surgeries could be

performed in a minimally invasive fashion with advantages of lesser blood loss, lesser post-operative pain, lower rate of peri-operative complications, lesser incidence of wound complications, shorter hospital stay and faster recovery.

Robotic surgery is an advanced form of laparoscopic surgery and has added benefits over it like, 3 D view with depth perception, magnification, tremor filtration, camera stability, hydraulic ergonomics, endo-wrist mechanism of the instruments, leading to better dexterity and precision and a faster learning curve, thereby allowing the application of minimally invasive technique to a much larger cohort of patients.

Gynecological malignancies are one area where robotic surgeries can benefit the most because we have to perform complex, radical procedures in the narrow confines of pelvis and the patients are usually obese with multiple comorbidities, further increasing the challenges.

Robotic platform got US FDA approved for gynecological malignancies in 2005 and since then its use has been on rise in various gynae cancers.

### ENDOMETRIAL CANCER

GOG (LAP-2) trial comparing laparoscopy and laparotomy in early stage endometrial cancer patients showed no substantial differences in oncologic assessment or outcome with laparoscopy.

A recent metanalysis concluded that Robotic surgery is a safer surgical approach than laparoscopy and laparotomy in surgical staging of endometrial cancer, with less estimated blood loss, blood transfusion, and conversion, and the same number of lymph nodes harvested.

Both the NCCN and ESGO/ESTRO guidelines suggest that MIS is the preferred approach when technically feasible for apparent early stage endometrial cancer including high risk endometrial cancer.

### SENTINEL NODE MAPPING IN ENDOMETRIAL CANCER

The fire fly mode incorporated in the Da Vinci robotic system allows the performance of sentinel node mapping which has now increasingly being accepted as a standard of care for nodal assessment especially in low risk Endometrial cancers, thus preventing the complications associated with systematic lymphadenectomy.

### CERVICAL CANCER

Conventionally, minimally invasive techniques were being used for radical surgery for early cervical cancer with ample retrospective data showing similar survival and lesser morbidity with MIS compared to open technique.

However, the results of the LACC trial published in 2018, showed the inferiority of MIS in the management of early-stage cervical cancer in terms of DFS and OS compared to laparotomy and dramatically changed our practice.

The ESGO and NCCN guidelines have changed their recommendations in favour of laparotomy in the surgical management of cervical cancer.

### CERVICAL TUMORS < 2 cm

Results of the LACC trial could not be generalized to patients with "low-risk" cervical cancer with a tumor size <2 cm because the trial was not powered for it.

The SUCCOR study, evaluating DFS in patients with stage IB1 (FIGO 2009) cervical cancer undergoing open vs. minimally invasive radical hysterectomy, found that MIS doubled the risk of relapse and death. However, in the group of patients with tumors  $\leq$  2 cm, there was no statistical difference for both relapse and death.

There are currently two ongoing prospective RCTs aiming to exclusively compare robotic surgery to open surgery in early-stage cervical cancer (RACC and ROCC trials) and the results are eagerly awaited.

Till further data is available, open surgery should be considered the standard-of-care surgical approach. Minimally invasive radical hysterectomies might be justified for tumors less than 2 cm, in a high volume centre with required surgical expertise.

### FERTILITY SPARING SURGERY IN CERVICAL CANCER

The IRTA study, compared 4.5 year DFS between open and minimally invasive radical trachelectomy for cervical cancer cases  $\leq$  2 cm in size, concluded that the DFS rates did not differ between the two groups.

### EXENTERATIVE SURGERIES IN RECURRENT/RESIDUAL CA CERVIX POST DEFINITIVE CHEMORADIATION

Experience with robotic-assisted pelvic exenteration for cervical cancer has now been reported by many authors.

LACC trial showed significantly worse survival in early stage cervical cancer with minimally invasive approach but one must apply caution while extrapolating the conclusions to recurrent setting.

A randomized controlled trial for these group of patients is highly unlikely, so in high volume centres with required surgical expertise minimally invasive approach can be offered to highly selected patients in these two groups.

### OVARIAN CANCER

#### EARLY STAGE OC

According to the most used OC guidelines, the standard approach for surgical staging in early-stage disease is laparotomy, although MIS may be used by an experienced surgeon in selected patients.

Various studies have shown similar survival outcomes when comparing open versus minimally invasive techniques and laparoscopic versus robotic technique for staging in early ovarian cancer.

One of the most challenging aspects of staging for OC is linked to the necessity of carrying out surgical procedures not only in the pelvis but also in other abdominal quadrants, such as the aortic lymphadenectomy and omentectomy. Robotic technology has evolved over time and the recent advancements in the design of the overhead boom provides greater liberty for accessing different abdominal quadrants from all position.

The pitfalls of port site metastasis and tumor spillage do exist. Incidence of port site metastasis is very low (0.18%) and tumor rupture is usually seen in larger tumors and those adherent to POD peritoneum, highlighting the importance of proper case selection for robotic surgery.

#### ADVANCED OC

The MISSION study concluded that MIS may be considered

for the management of patients with AOC who have undergone NACT, when surgery is limited to low-complexity standard cytoreductive procedures.

The results of ongoing LANCE trial, comparing MIS versus laparotomy in women with advanced-stage high-grade epithelial OC after 3 or 4 cycles of NACT, are awaited.

### RECURRENT OC

Different retrospective series have shown that the MIS including robotic approach is feasible and safe for selected patients with ROC, particularly in case of localized peritoneal disease, lymph-nodes, or isolated parenchymal lesion with lower incidence of morbidities and apparently without compromising their survival.

### VAGINAL AND VULVAR CANCER

Radical hysterectomy with Radical total and partial vaginectomy with pelvic/inguinal lymph node dissection for early vaginal cancer can be performed robotically without affecting the survival outcomes though the data is scarce.

Inguinal node dissection for treatment of vulvar cancer can be performed robotically (R-VEIL) and is associated with a significant reduction in incidence of wound related complications.

Thus, Robotic-assisted surgery has transformed the field of gynecologic oncology over the last 15 year. Telesurgery and the ability for surgeons to operate remotely with robotic technology is emerging as an area of research.

**Dr. Vandana Jain**  
Head Gynae Oncology

## ARTIFICIAL INTELLIGENCE IN ONCOLOGY: REVOLUTIONIZING CANCER DIAGNOSIS AND TREATMENTS

In recent years, artificial intelligence (AI) has emerged as a transformative force in almost every field including oncology, promising to revolutionize cancer diagnosis, treatment planning, and patient care. It's pertinent for us to know about the profound impact of AI on oncology, its applications, challenges, and future potential.

### Introduction

Cancer remains one of the most challenging health issues globally, with its complexity and heterogeneity posing significant obstacles to effective diagnosis and treatment. Traditional approaches rely heavily on expert knowledge and empirical data, which can be limited in scope and prone to human error. AI, with its ability to analyse vast amounts of data and identify complex patterns, offers a promising solution to these challenges.

### Applications of AI in Oncology

AI is being applied across the entire spectrum of cancer care, from early detection to personalized treatment plans and patient monitoring. One of its primary applications is in medical imaging analysis. AI algorithms can analyse radiological images such as CT scans, MRIs, and mammograms with unprecedented accuracy and speed, aiding radiologists in detecting tumours at earlier stages and with greater precision than previously possible.

For example, deep learning models have been developed to distinguish between benign and malignant lesions in mammograms, reducing false positives and missed diagnoses. Similarly, AI-powered algorithms can analyse pathology slides to detect subtle signs of cancer in tissue samples, helping pathologists make more accurate diagnoses.

AI is also revolutionizing cancer treatment using predictive analytics and personalized medicine. By analysing genomic data, AI can identify molecular biomarkers that predict a patient's response to specific therapies. This enables oncologists to tailor treatment plans to individual patients, maximizing efficacy while minimizing adverse effects.

Furthermore, AI-driven platforms are being developed to assist oncologists in clinical decision-making. These platforms integrate patient data, medical literature, and treatment guidelines to recommend the most effective treatment options based on the patient's unique profile and disease characteristics.

### Challenges and Limitations

Despite its promise, the integration of AI into oncology faces several challenges. One significant hurdle is the need for high-quality, annotated data for training AI algorithms. Medical data is often fragmented, heterogeneous, and

subject to privacy concerns, making it challenging to create large, diverse datasets necessary for robust AI models.

Moreover, the interpretability of AI-driven predictions remains a critical issue. While AI can generate highly accurate predictions, understanding the rationale behind these predictions is essential for gaining clinician and patient trust. Efforts are underway to develop explainable AI techniques that provide transparent insights into AI decision-making processes.

Ethical considerations surrounding AI in oncology also merit attention. Issues such as data privacy, algorithmic bias, and equitable access to AI-driven technologies must be carefully addressed to ensure that AI benefits all patients and healthcare providers equally.

### Future Directions

Looking ahead, the future of AI in oncology holds tremendous promise. Advancements in AI technology, including federated learning and reinforcement learning, are poised to further enhance the capabilities of AI models while addressing concerns related to data privacy and scalability.

Moreover, AI has the potential to facilitate more efficient clinical trials by identifying eligible patients based on specific genetic profiles and predicting treatment outcomes. This could accelerate the development of new therapies and improve overall patient outcomes.

Collaborations between interdisciplinary teams of clinicians, data scientists, and AI experts are crucial for realizing the full potential of AI in oncology. By harnessing the collective expertise of these diverse fields, innovative solutions can be developed to tackle the complex challenges posed by cancer.

### Conclusion

In conclusion, artificial intelligence represents a paradigm shift in oncology, offering unprecedented opportunities to improve cancer diagnosis, treatment, and patient care. From enhancing diagnostic accuracy to enabling personalized treatment plans, AI has the potential to transform the way we approach cancer management.

However, realizing this potential requires addressing significant challenges, including data quality, interpretability, and ethical considerations. By overcoming these hurdles through collaboration and innovation, AI has the power to significantly impact the lives of cancer patients worldwide.

As we continue to advance AI technology and integrate it into clinical practice, the future of oncology looks increasingly promising, with AI playing a central role in the fight against cancer.

**Dr. Kapil Goyal**  
Consultant, Medical Oncology



## EDITORIAL (CONTINUED)

• **Distributed Denial of Service (DDoS) Attacks** – The malware installed by the attacker generated millions of messages and floods all across the network with an intention to choke the network. The victim is not able to perform any business activity over the network. This is called 'Denial of Service'. Once this attack spreads across all segments of the network, it is called 'Distributed Denial of Service (DDoS)'.

• **Ransomware Attack** – This type of attack goes a step further. It encrypts all the sensitive information contained inside IT Infrastructure of the victim and asks for large sum of money to be deposited to an account as a price to decrypt and enable the victim to run the operations again.

These are some of the actions performed by attackers. However, this list is not exhaustive. These threats and vulnerabilities are ever growing and individuals, organizations and nation states are all actively working to deal with this menace. Cyber warfare is one of the forms of attacks that a nation state may perpetrate on the other.

There are no short-cuts to deal with cyber risks. If we intend to take advantage of internet and global connectivity, there is an associated price attached with it. We must follow principles of cyber hygiene to stay safe. Some of the key precautions are listed below that help Individuals and Organizations to stay safe from such attacks.

### Preventive Actions at Individual Levels

- Increase your awareness on Privacy and Security
- Follow your gut – take a pause and verify the inputs

coming from an unknown source.

- Avoid using public network to access internet
- Protect your electronic devices with a leading anti-malware
- Remove unnecessary Apps from your mobile devices
- Do not click on URLs or Open attachments from the e-mail where sender is not trusted
- Keep your passwords safe and keep periodically changing them
- Do not call back on calls coming from unknown numbers
- Do not reveal sensitive personal information to unknown callers
- Never share OTPs with anyone
- Report any cyber incident to cyber police

### Preventive Actions at Business / Organization Levels

- Increase your employee awareness on Privacy and Security
- Have a well-defined information security policy
- Follow standard Information Security framework (e.g. ISO27001)
- Get your cyber security posture assessment and audit done at regular intervals
- Create a dedicated team for Information Security management and Response
- Invest in tools to monitor and protect Information Security Posture
- Follow a zero trust policy

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