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NewsLetter

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EDITORIAL

COVID-19 VACCINE UPDATE

COVID-19 Pandemic has shown the world the importance of staying healthy.Undoubtedly, vaccines are one of the most effective tools to prevent diseases and death within human population.

The world is still amidst a COVID-19 pandemic and our only ray of hope are vaccines, as getting vaccinated has the potential to save millions of lives each year. They work by training and preparing the body's natural defenses – the immune system – through simultaneously recognizing and fighting off the viruses and bacteria they target. After vaccination, if the body is later exposed to those disease-causing germs, the body is immediately ready to destroy them, preventing illness and death.

The Immune System—Body's Defense against Infections

To understand how vaccines work, it is important to first look at how our bodies generally fight illnesses. When germs, such as bacteria or viruses, invade the body, they attack and multiply. Specifically, this invasion,called an infection, is what causes illness. The immune system of our body uses a myriad of tools to fight such infections. Primarily, the white cells consisting of macrophages, B-lymphocytes and T-lymphocytes destroy the bacteria orvirus. Some people believe that naturally acquired immunity—immunity from having the disease itself—is better than the immunity provided by vaccines. However, natural infections can cause severe complications and can be deadly. Thus vaccination is the best way to prevent them as compared to letting our natural immunity fight against such diseases.

Types of Vaccines

· **Live, attenuated vaccines:** These vaccines contain a version of the respective living virus or bacteria that has been debilitated in a way so that the virus does not cause any serious illness in people with healthy immune systems. Live, attenuated vaccines are similar to a naturally occurring infection. Even though they are highly effective, not everyone can receive these vaccines. For instance,children with weakened immune systems and people undergoing chemotherapy—cannot get live vaccines.

· **Inactivated vaccines:** These are made by killing or inactivating the germ during the process of vaccine creation. Often time, multiple doses are necessary to build up or maintain immunity.

· **Toxoid vaccines:** They prevent diseases caused by bacteria that produce toxins in the body. In the process of making these vaccines, the toxins are weakened so they cannot cause illness. Weakened toxins are called Toxoids.

· **Subunit vaccines:** This vaccine only includes parts of virus, bacteria, or subunits instead of an entire germ. Since these vaccines only contain the essential antigens and not all molecules, side effects are less common.

· **Conjugate vaccines:** Such vaccines fight a different type of Bacteria with polysaccharides as antigens. Specifically, this linkage helps the immature immune system to not only react to the coating but also helps in the development of an immune response.

Specifically talking about the SARS-CoV-19 we have different types of vaccines with varied levels of efficacy.

(Continued on Page No. 4)

As of April 2021, 13 vaccines have been authorized:

- mRNA vaccines
  - Pfizer–BioNTech vaccine
  - Moderna vaccine
- 5 conventional inactivated vaccines
  - BBIBP-CorV
  - Corona Vac
  - Covaxin
  - WIBP-CorV
  - CoviVac
- 4 viral vector vaccines
  - SputnikV
  - Oxford–AstraZeneca vaccine
  - Convidecia
  - Johnson & Johnson vaccine
- 2 protein subunit vaccines
  - EpiVacCorona
  - RBD-Dimer

In total, as of March 2021, 308 vaccine candidates were in various stages of development, with 73 in clinical research, including 24 in Phase I trials, 33 in Phase I–II trials, and 16 in Phase III development.

Usually, it takes approximately ten years to develop an effective vaccine, but all these first-generation vaccines have a year old immunogen and are all EUA (Emergency use authorization).

VACCINATION - IS A MUST?

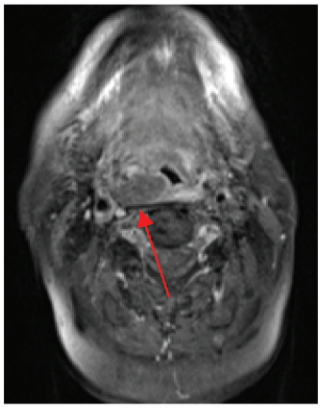
We have a virus that has been constantly mutating for last one year. As on date, there are thousands of different variants, however only a handful of them are worthy of concern. These "Variants of Concern" (VoC) are directly linked to the evolution and survival of viruses. Over time, these VoC's have become highly efficient in transmission and thus are capable of reinfection in previously infected people as few persons have been vaccinated worldwide resulting in a large susceptible pool of population for the virus to infect, replicate and mutate.

Even though, the effect of the VoC's on the first generation of COVID-19 vaccines has been mixed, however, the available data illustrates that the present vaccines might still be sufficient to protect individuals against COVID-19, or at least severe COVID-19. Modifying present COVID-19 vaccines is the need of the hour and gladly work has already been started to protect against variants. Safe and effective vaccines are game changer: but for the foreseeable future we must continue wearing masks, maintaining physical distance, and avoiding big and large gatherings.Undeniably, vaccinations are the rays of light at the end of the tunnel however, being vaccinated does not mean that we can throw caution to the wind and put ourselves and others at risk.

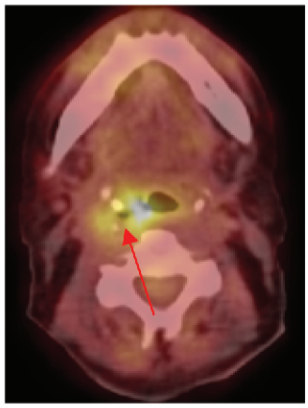
Holistically, looking at the infection rate and the vaccination data, studies suggest that infections are very low after vaccination. However, looking at a bigger picture, getting the vaccine is one of our best options to collectively survive this pandemic. Please continue to do your bit. Do not let your guard down. Do not fall victim to the pandemic fatigue.

CAROTID BLOW OUT SYNDROME (CBS) - A LIFE THREATENING EMERGENCY

Mr. Z, a 63 years old gentleman, (follow up case of Ca left Pyriform Sinus, status post CT/RT in 2010). He presented to the hospital in Feb 2021 with stridor and underwent emergency tracheostomy. Imaging was suggestive of development of a new mass lesion measuring approximately 3.5 x 2 cm in right pyriform sinus and he underwent DL Scopy and biopsy for the same which showed inflammatory changes and slough material.



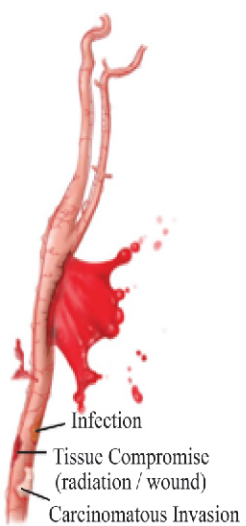
Contrast enhanced MRI Neck image showing the mass lesion in right pyriform sinus.



PET-CT fused image showing the hypermetabolic mass lesion in right pyriform sinus.

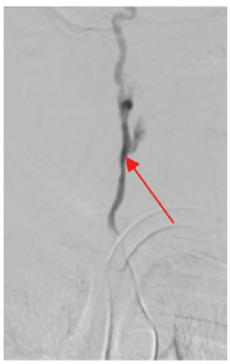
On April 16, 2021, the patient presented to the hospital emergency with complains of massive bleeding from oral cavity and nose and was in haemorrhagic shock. He was immediately resuscitated & managed in the ICU. Within no time in the ICU itself, the patient had a massive bout (>500cc) of bright red blood passing through the mouth and the nose along with clots. And the patient started to deteriorate further even with full ionotropic support and simultaneous transfusion of blood and its products. In view of the critical condition of the patient as he was bleeding massively, the initial plan of getting a CT angiography was aborted and the patient was shifted to the Interventional Oncology Cath Lab for emergency angiography and embolization.

Clinical picture of the patient on the angiographic table

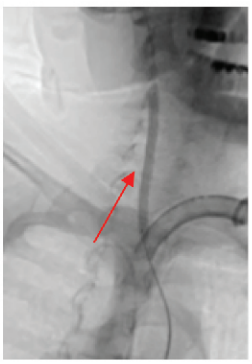


Diagrammatic representation of a Carotid Blowout Syndrome with most common etiological factors

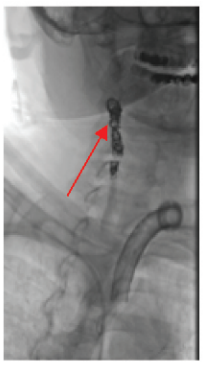
After establishing access into the arterial system through right common femoral artery, angiography was done for the head and neck vessels. The Critical Care & Interventional Oncology teams were in a'all hands on deck' type situation as the patient was bleeding massively. We immediately found active contrast extravastion from the Right Common Carotid Artery (CCA), suggestive of Carotid Blowout Syndrome. All this while the patient was exsanguinating and even on full ionotropic support, the patient was crashing. To stop the bleeding, a 8mm balloon was inflated across the rent in the right common carotid artery and the bleeding stopped immediately. This gave the whole critical care and Cath Lab teams a breathing moment and this surely was the moment when we all felt that we have started onto the definitive path of bringing our patient back from the jaws of death.



DSA images showing active extravasation of contrast from Right CCA, s/o Carotid Blowout Syndrome



Balloon inflated across the Right CCA rent



Coils and glue embolization in Right

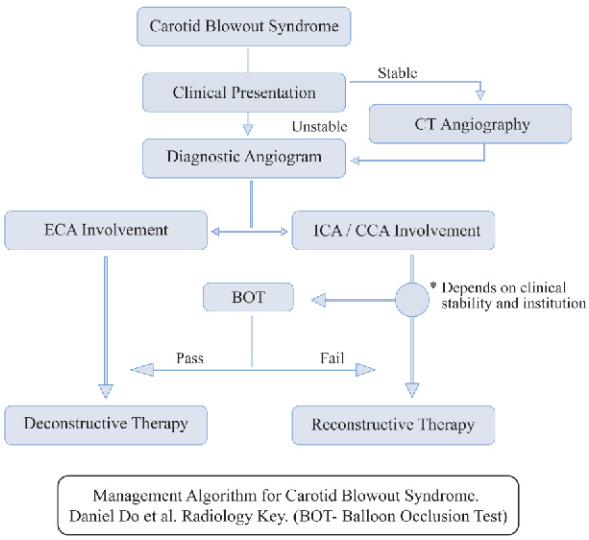
The balloon occlusion also allowed us to test for “Balloon Occlusion Test” to assess for adequacy of collateral circulation into the brain from the opposite Carotid artery. The patient did not develop any neurological deficit. In view of a successful balloon occlusion test and the presence of sloughed off/ inflammatory/infected mass in the right pyriform sinus, we decided to block the right common carotid artery (Deconstructive therapy) instead of a placing a covered stent (Reconstructive Therapy) as that would have entailed the risk of an infected graft at a later date.

We deflated the balloon and occluded the right CCA with platinum coils ranging in size from 6mm to 8mm followed by glue embolization. Post-embolization, no flow was elicited across the occluded segment of right CCA and the patient did not develop any neurological deficit as well.

The procedure was successful and with the combined efforts of Surgical, Critical Care and Interventional Oncology Teams, the patient's life could be saved.

The Carotid Blowout Syndrome (CBS) is a rare but rapidly fatal complication of the head and neck malignancies with upto 80% cases turning to be fatal due to uncontrollable haemorrhage. It is more commonly seen in patients who have undergone prior radiation or surgical interventions.

The emergency open surgical ligations without testing the collateral cerebral circulation are associated with higher neurological complication. They are also difficult because of prior irradiated or



Management Algorithm for Carotid Blowout Syndrome.
Daniel Do et al. Radiology Key. (BOT- Balloon Occlusion Test)

infected fields. With advances in Interventional and Endovascular techniques, the outcomes have significantly improved. Endovascular methods are well suited for the management of CBS of any etiology: salvage surgery in heavily irradiated patients, rupture after reirradiation for recurrent tumor or bleeding caused by direct carotid invasion of persistent or recurrent tumor.

Embolization procedures have become the most frequently used endovascular method for management of CBS and can save lives in such emergent conditions.

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"PAIN AND PALLIATIVE CARE" – A NEW PILLAR IN CANCER TREATMENT

RGCIRC, Niti Bagh

In Oncology practice, there is a growing need to provide comprehensive care so that we can improve the quality of life of patients suffering with advanced stage metastatic cancer. Palliative care is the need of the hour and is a new supporting pillar for this comprehensive model of cancer treatment along with surgery, radiation and chemotherapy. Palliative care is a part of best practice in Oncology, as endorsed by the American Society of Clinical Oncology (ASCO), European Society for Medical Oncology, the National Comprehensive Cancer Network (NCCN), and the Society for Surgical Oncology. In simple terms, we describe palliative care as:

P - Pain relief
A- Approach "multidisciplinary to interdisciplinary"
L- Living worthy life knowingly death is inevitable
L- Loyal and effective communication
I - Inspire allied specialties for early palliation of patient
A- Allay anxiety of patient and family
T -Trustworthy "doctor-patient" rapport
I - Identification of issues (physical, psychosocial, spiritual & emotional)
V - Vitality of body and positivity of mind
E - Enhance quality of life by early palliative care

Studies have shown that patients with advanced cancer receiving potentially curative therapy are likely to suffer from variety of symptoms (physical as well as psychological). Apart from pain treatment which is the foremost need of palliative care, patients as well as their families also need education/counseling for their spiritual, financial and family distress that occur as a result of the diagnosis of a devastating disease and a poor prognosis. To counter this distress, pain and palliative care treatment should be introduced at the earliest in the course of cancer management.

Evidence has shown that early pain and palliative care definitely improves the quality of life and increases functional capacity by reducing the sufferings of the patient due to better symptom control. We, at Rajiv Gandhi Cancer Institute and Research Centre are happy to combine Pain and Palliative/Supportive care along with the Oncology units to have a better outcome in terms of overall patient care in cancer treatment.

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EDITORIAL (CONTD.)

COVID-19 Vaccine Comparisons

Vaccine Type	Technology	Efficacy	Clinical Trials	Doses	Storage
Oxford-AstraZeneca  **Covishield**	Viral Vector – A harmless virus is engineered to contain the gene for SARS-CoV-2 spike protein	62%	Completed	2 Doses, 6-8 weeks apart	Refrigerated at 2-8* C
 **Covaxin**	Whole-Virion Inactivated Vaccine	70%	Completed	2 Doses, 6-8 weeks apart	Refrigerated at 2-8* C
Pfizer-BioNTech 	mRNA- RNA template for the spike protein	95%	Completed	2 Doses, 21 days apart	Freezer storage at -70*C
Moderna 	mRNA-RNA instructs our cells to produce the SARS-CoV-2 spike protein to trigger an immune response	94.1%	Completed	2 Doses, 28 days apart	Freezer storage at -20*C

Vaccine Type	Technology	Efficacy	Clinical Trials	Doses	Storage
Sinopharm 	Inactivated virus SARS-CoV-2 virus is rendered inert through a chemical process that preserves the structure of the virus.	79.3%	Completed	2 Doses, 3 weeks apart	Refrigerated at 2-8* C
Johnson & Johnson 	Viral Vector – A harmless virus is engineered to contain the gene for SARS-CoV-2 spike protein	Not yet known	Completed	1 Dose	Refrigerated at 2-8* C
Gamaleya  **Sputnik V**	Viral Vector – A harmless virus is engineered to contain the gene for SARS-CoV-2 spike protein	91.4%	Completed	2 Doses, 3 weeks apart	Freezer storage at -20*C
 **Novavax**	Protein-based COVID-19 vaccine	89.3%	Phase 3 Trials		Refrigerated at 2-8* C

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