Special Supplement on NEUROSURGERY

Editorial

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Outline of recent advances in present Neurosurgical scenario

In the last few decades there has been a sea of changes in Neurosciences that has revolutionized Neurosurgery. At present Neurosurgery in India is at par with the world. India is capable of providing the most advanced treatment and procedures in Neurosurgery. This has obliterated the necessity of traveling abroad for high end Neurosurgery. Indians can be proud of the high standards of professionalism and care, that are available in the country.

Evolution of Neurosurgery over the Years :

What had been a rather dim affair regarding the prognosis of patients has now changed to a rather hopeful situation. This has happened due to the advent of devices like CT scan and MRI, which are available almost everywhere. Neuronavigation, frameless stereotactic biopsies, Neuro endoscopes are the other instruments that aid diagnosis and treatment. The tumour markers have aided the diagnosis of malignant brain tumours.

With advances, including the introduction of medications to reduce the severity of brain swelling, brain surgery has seen an incredible evolution. Brain surgery mortality almost instantly dropped to 20% from 60-80%. Camera (first invented in the 17th century with the first photographic click taking place in the early 1800s), and with the technology of the camera, operating high precision microscopes and endoscopes has revolutionised brain surgery. These two pieces of technology are truly complementary to each other., a true example of symbiosis. Exoscope is the latest invention, endoscopes combined with a microscope. Another major advance in brain surgery is the use of image guided technologies, in the form of neuronavigation, a true real time navigation which is likely to be less invasive and safer for the patient. Latest investigation in the form of MRI, CT, CT Angiogram, PET, SPECT, has revolutionised the diagnosis of brain diseases at the earliest.

Conventional surgery of the spine often use "live" x-rays during surgery (called fluoroscopy, c-arm) for operation of spinal decompression with transpedicular titanium screw and rod fixation, lumbar disc disease, cervical disc disease, cervical canal stenosis and spinal injuries .In the past decade, great advances have been made. "computer-assisted, image-guidance," navigation technology uses a computer and radiographic studies (x-rays) of the patient to allow the surgeon to know precisely the site of operation and this allows the surgeon to more accurately place spinal instrumentation, perform decompression (eg, eliminate pressure on nerves), remove tumors, and other tasks. The future of spinal navigation lies in intraoperative CT, MRI, and fluoroscopy-based CT. Great success has been achieved with titanium for using cages, rods, screws, hooks, wires, plates, bolts, and other types of spinal implants. The great advantage of titanium is that CT and MRI imaging can be performed after implantation with little interference.

Bone Graft can be autologous or allograft. The future of the graft lies in Morphogenetic Proteins (BMP). which will likely eliminate the need for either autologous or allograft bone use and can be used in disc space or backside of spine. Ceramic and Carbon fibre have been used as carriers of bone graft or vertebral body replacements. Plastics and Polymers eg, radiolucent Polylactic Acid (PLA) polymers are being developed or PLA will do its job in holding bone graft material and providing support long enough for a fusion . In the future, disc replacement or regeneration may replace the role of fusion in some patients. Other forms of disc replacement may involve re-establishing the inner nucleus of the disc only with a gel-like material.

Recent research involve genetically-engineered cells which may be surgically implanted or injected into a degenerated disc, thus allowing for regeneration of disc material. Endoscopes have been used selectively in disectomy and laminectomy. Percutaneous transpedicular fixation can also be done. The integration of emerging technology and biological advances can result in smaller incisions, less trauma to normal tissues, faster healing time, and quicker return to functional status.

Recent anticonvulsants, and Stem cell therapy, drugs for multiple sclerosis and brain rejuvinators are the advancements, that have helped lot of patients. The sophisticated microscopes, gamma knife, and robotics can help the surgeon to perform operations with precision, that could not be achieved previously. Neuro anaesthesia has advanced beyoung time and neonatal surgery is also being done. The post operative recovery is being looked into by specialized teams of doctors in CCU, who have made the outcome of patients a lot better. Research in Neuroscience and technological advances will surely the future of neurosurgery better in near future.