Editors

Safety Scores in Spine Surgery - Technique or Technology

Shailesh Hadgaonkar[1], Ketan Khurjekar[1], Ashok Shyam[1,2]

The last 2 decades have seen a sea of change in the realm of spine surgery, in India, Asia and the world over. Ever improving implants, surgical techniques and diagnostic modalities have improved our results and reduced the risks involved in spine surgery. However, even today, explaining the risks and complications of spine surgery to a patient sitting in your consultation room is a daunting task- be it regarding a routine Microdiscectomy or a complex spinal reconstruction.

We often see and read of devastating complications and adverse events in spine surgery. And this is extremely disheartening because as surgeons, we attempt to deliver nothing but the best to our patients. What further complicates this intricate formula is the fact that similar surgery for a particular clinical prototype often has widely varied outcomes.

Where Do We Stand Today?

Diagnostic imaging too has come a long way from when Dr. Jules Guerin first attempted to surgically correct scoliosis. In fact, recent literature tells us that even our "State-of-the-art" PET scans and high-resolution Tesla MRI machines are soon to be supplemented by hybrid technologies such as the Fusion PET-MRI which combine the superior soft tissue contrast afforded by MRI scanners with PET-provided real time physiologic and metabolic data. Our understanding of conditions, especially spinal tumors stands to exponentially improve owing to such advancements in imaging.

Neuromonitoring has emerged as a valuable tool in ensuring safety during the intra-operative period. Mainly of use in deformity corrections, Tumor surgeries and other complex spine surgery, it is on its way to becoming a requisite piece of tech in the spine surgeon's armamentarium.

[1]Sancheti Institute for Orthopaedics &Rehabilitation, Pune, India
[2]Indian Orthopaedic Research Group, Thane, India

Address of Correspondence
IJS Editorial Officie
A-203, Manthan Apts, Shreesh CHS, Hajuri Road, Thane [w]
Maharashtra, India.


Dr. Ketan Khurjekar


Dr. Shailesh


Dr. Ashok Shyam

The arrival of guidance and navigation capabilities in real-time combined with the computing power to reconstruct these into a 3D map has ushered in an era where robots and surgeons today work hand in hand to improve patient outcomes. These technologies have come a long way from merely improving the accuracy of pedicle screw placement. Today, image guided robotics and intra op navigation are being put to use in complex spinal surgeries, spinal revisions, intra-dural tumor resections and even spinal column reconstructions. In addition to improving accuracy, they also aid the surgeon by reducing the physiological element of fatigue from repetitive actions and reducing the exposure to ionising radiation.

Minimally invasive spine surgery techniques are today being used for an ever- expanding list of indications. Despite suffering from a steeper learning curve, reduced intra op and post op morbidity, shorter hospital stay and earlier return to normal life are making MISS a mainstay in the management of many degenerative, traumatic, deformity and neoplastic processes.

It will not be long before molecular engineering ties hands with biomaterial advances and materials such as Bone Morphogenetic Proteins (BMPs) are available on a commercial level for selective cases in spinal fusions. This is likely to eliminate the need for auto and allografts and is expected to even usher in an era of biodegradable spacers. The theoretical possibility of implanting genetically engineered Growth stimulating proteins into degenerated discs to bring about the regeneration of disc material is also being tested in various centres around the globe.

It is truly a great time to be practicing as a spine surgeon these days when the line between science fiction and science are rapidly blurring. The day is not far when the patient and the operating surgeon will no longer even need to be in the same operating room. These new machines and gizmos shall probably end up replacing every aspect of our professional lives,

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