

## **An ideal prescription for success of spine care on a mass scale**



**Dr Arvind G Kulkarni heads the Mumbai Spine Scoliosis and Disc Replacement Centre as a Consultant Spinal Surgeon at Bombay Hospital, Mumbai, one of the oldest and largest hospitals of India. He has vast experience in spinal surgery, having trained in some of the top spinal centres across the globe, such as KEM Hospital Mumbai, National University Hospital Singapore, Westmead Adult & Children's Hospitals, Australia, St George Hospital, Australia, and Toronto Western Hospital and Hospital for Sick Children in Canada. He is one of the pioneers of Minimally Invasive Spinal Surgery in India. He introduced 'Micro-**

**Endoscopic' techniques using the MetrX system for the first time in India in 2007. He is also one of the pioneers of Artificial Disc Replacement. He has performed the first Artificial Disc Replacement (ProDisc-L) in the country, a feat recognised by the Limca Book of Records. His special interests are Minimally Invasive Spinal Surgery, Deformity Correction, Artificial Disc Replacement, etc**

**By Prashob K P**

**Tell us about the latest techniques and solutions available in the specialised field of minimally invasive spinal surgery.**

'Micro-Endoscopic spinal surgery' is a specialised revolutionary technique with which routine spinal surgeries are performed using a key-hole. The most common spinal afflictions are disc herniations (slipped disc), lumbar canal stenosis, and spinal instability. Generally, an open surgery is done to tackle most of these conditions. However, with the micro-endoscopic techniques, the objectives of the surgical procedure are achieved without any significant collateral damage to the soft tissue (muscles and ligaments), or the bony skeleton. Tubular retractors with diameters of 16 mm, 18 mm, and 22 mm are passed through the key-holes to perform the procedures based on the indication of surgery. Apart from the elegance and cosmetic appeal, this technique has several advantages. The scar is miniscule (1.5-2cm long) and appears like an ordinary scratch. Since there is no muscle or bony trauma, the contours of the back are well preserved. The dependence of the patient on pain-killers for the wound site pain is absolutely minimal as compared to an open surgery. In fact, patients do not express any experience of wound site pain after a few hours of surgery. Since the tissue trauma is so minimal, there is no stress on the patient's metabolic functions, unlike after a big open surgery that is associated with significant tissue trauma. Most of these patients are elderly with accompanying baggage of associated conditions such as diabetes, hypertension, heart issues, etc and a swift and painless procedure such as this makes a big difference in terms of their recovery. In obese patients, the surgery makes a monumental difference. Obese patients are associated with wound-healing problems. In these patients, a long incision is otherwise needed to reach depths of 7-8 cm (to reach the spine). The entire procedure can be done using a keyhole in these patients (lots of patients with this condition are obese because they do not walk as a result of pain and hence accumulate weight). The blood loss with this procedure is minimal. The patients are made to walk within a few hours after surgery and can go home the very next day. A water-proof dressing is applied so that the patient can take bath as early as he/she wishes to.

**Can you give us the specifics of the artificial disc replacement procedure you have pioneered?**

The first Pro-Disc-L (AO Synthes) artificial lumbar disc replacement in India was performed by us at Bombay Hospital in 2008. It is an FDA-approved prosthesis and has polythene (ball) over metal (socket) configuration. The artificial disc allows motion in all planes. The rationale for disc replacement is as follows: spinal fusion (excision of the inter-vertebral disc and welding of the vertebrae abolishing motion) has been the standard of care for unrelenting back pain secondary to disc degeneration. Though spinal fusion has stood the test of time, it has some concerns. Post-operative recovery is relatively slow; non-union, bone-graft site morbidity and instrument-related problems are observed in a certain percentage of cases. Though the incidence of adjacent level degeneration (increased stress on the adjacent inter-vertebral disc) following spinal fusion remains unresolved, biomechanical and kinematic investigations demonstrate increased load and movement adjacent to fused segments. For a long time, there was no alternative between taking chronic medication and undergoing a spinal fusion operation for the diagnosis of degenerative disc disease in the absence of central canal or foraminal stenosis. Disc replacement is an option for such patients with chronic back pain who meet the selection criteria. The benefits of motion preservation and protection of adjacent levels from non-physiologic loading make prosthetic replacement of the disc a potentially attractive choice.

**How affordable are these treatments considering that the techniques involve high-end, cost-intensive equipment?**

Once you make an investment and buy the minimal access equipment, there are no recurring costs involved – it is usually a one-time investment. In the long run, the costs are actually cheaper as compared to an open surgery for the patient. The reasons are several – lesser stay in the hospital, less dependence on medication, early return to work, etc. Our recent research shows that the costs borne by a patient undergoing a minimal access surgery, when compared with open surgery, are much less in the event of a post-operative complication. Artificial discs are expensive and basically, the patient pays for the technology. However, like anything else in the world, once the awareness and the volumes (number) of disc replacements increase, the costs will come down automatically.

Does India have the medical and scientific expertise to pioneer innovative treatments for the spinal injury-induced paralytic patients on the lines of the Miami Project to Cure Paralysis?

It is not difficult to organise for the expertise – we have the brains. The problem lies in developing an infrastructure. How many dedicated comprehensive spine care centres do we have in India? First of all, we have to change our mindset. Most of the investments in healthcare in India are profit-driven. Unfortunately, spine injury-paralysis treatment is low on priority. At the

same time, a lot of money, perseverance, and patience are necessary to develop such centres. The government, or someone from the corporate sector, must take an initiative to fund such investments.

### **Is there a lack of mass awareness on availability of effective treatments for spinal injuries?**

Yes. There are several reasons for the same. Although back pain is extremely common in society, there is meager understanding of the subject in our routine curriculum during MBBS. There is no stress on understanding the basics of spinal functioning, spinal disorders, and treatment options during basic training. Let alone basic MBBS training, spine training is very basic, if not almost absent, during MS (Orthopaedics) courses in many university hospitals in the interiors. Unless the doctors are trained, awareness about the importance of spine care will not percolate down to the general population. The other important reason is scare. Spine surgery was and is still considered dangerous, leading to some kind of neurological weakness. This is because of ignorance of the newer understanding of the subject and treatment options. Now, we have specialised spine surgeons devoted to spine care, enhancing the success rates as well as safety of the surgical treatments.

### **Can patients undergoing disc corrections or replacement hope of leading a normal life?**

Yes, of course. The emergence of newer technologies and deeper understanding of spinal functioning in the last few years has revolutionised the field of spinal surgery. Optimal treatments decided on a case-to-case basis, keeping in mind the pathology, the radiological findings along with patients demands and expectations, yield long-term results. One of the common goals of minimal access spine surgery and artificial disc replacement is 're-establishment of normal anatomy and physiology' of the spine. While minimal access surgery achieves goals of surgery with least collateral damage to the musculo-skeletal structures, artificial disc replacement maintains spinal mobility.

### **What are the challenges in the field of spine care as of today?**

The most significant challenge is creation of awareness among people that spine problems do have excellent solutions. Although there are spine specialists in the major cities, such as the state capitals, the two-tier cities and towns lack expertise. This issue needs to be taken into consideration and more training centres and fellowship opportunities should be provided. We also need to develop special spinal physiotherapists and develop rehabilitation centres for spine care, especially the spinal injury patients. The other challenge is to make treatment options affordable to the majority of the population.

### **Are Indian spinal treatments at par with the global standards?**

In the major cities, yes. The only area where we lack is research and development. In terms of technology, we are slightly behind the global standards. In terms of expertise, we are as good as the global standards.

**Is there a need for inclusion of spine care as a special initiative in the health programmes of the Centre or states?**

Yes. This is extremely necessary. A lot of backs and necks can be saved. The spine is an integral and key component of the human body. Disability resulting from spinal ailments is quite common, affecting work and activity. Back pain is the most common reason for sickness absenteeism worldwide. An initiative such as this would bring focus on spine just as all other major specialties.

**What's the incidence of spine injuries in India and how many of these cases have attained success?**

We do not have statistics on this. However, based on my experience, I can say that it is quite common. Most of these are a result of road traffic accidents (two-wheelers) and falls from construction sites. Unfortunately, most of these patients are young and come from poor economic backgrounds. It is universally well-known that the partially paralysed patients have a potential to recover following a spinal injury as compared to completely paralysed patients, provided early surgical intervention is done.

**An accomplished spine surgeon**

*Dr Arvind G Kulkarni is an invited faculty at most of the national spine conferences and workshops. He has made various national and international podium presentations. He has numerous scientific publications in high-impact journals to his credit. He has also contributed to chapters in textbooks. He is in the Editorial Board of Indian Journal of Orthopaedics for the section on spine. He has done clinical research in various fields – morphometric study of Indian skeletal structure and size in relation to the application of implants; craniovertebral index and its application; innovative treatment of neglected high-degree scoliosis; spinal tuberculosis etc. He was awarded the International Spinal and Spinal Cord Spinal Injury Best Paper Award in 2012. He was awarded the Association of Spine Surgeons of India's Best Publication Award in 2005. He has been awarded the Scoliosis Research Society (USA) Global Outreach Award twice in 2004 and 2005. He has been a recipient of the Korean SICOT Award in 2008.*