

# Lumbar Disc Replacement

## When Is It An Option?



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### Did you know...

80% to 90% of the population will have at least one episode of low back pain (LBP) in their lifetime. Complaint of LBP constitutes the most common reason for office doctor visits, for the Workplace Safety and Insurance Board claims and for employment absenteeism.<sup>1,2</sup>

### Point #1

Degenerative disc disease (DDD) in the lumbar spine is a common etiology of low back pain (LBP). The degenerative changes may be associated with normal aging and continue throughout life, but can also be accelerated after lumbar spinal surgery at the operated disc level and/or in the adjacent levels.

### Common causes of low back pain

- Discogenic: Degenerative, herniation, discitis
- Referred pain from hip or sacroiliac joint
- Vertebral: Fracture, osteomyelitis, tumour
- Other spinal joints: Facet joint
- Neurogenic: Nerve root compression, tumour
- Muscologenic
- Vasculogenic: Peripheral vascular disease, aortic aneurysm
- Viscerogenic: Gastrointestinal, genitourinary

### Point #2

Spinal fusion (arthrodesis) has been used to relieve chronic LBP associated with DDD by the restoration of disc height, the elimination of abnormal motion and/or the removal of stress on spinal joints. However, spinal arthrodesis, by its own nature, does not restore the normal spinal mechanics. It can, therefore, result in transfer of abnormal load and stress to the adjacent, unfused segments, leading to degeneration of those segments and recurrent pain.

### Nonoperative treatments of low back pain

- Rest vs. activity
- Lifestyle or job modifications
- Weight loss
- Physiotherapy, massage, acupuncture, chiropractic manipulations
- Transcutaneous electrical nerve stimulation, heat, cold compresses
- Anti-inflammatories, pain-killers, muscle relaxants
- Epidural steroid injections, facet joint block, nerve block
- Botulinum toxin injections

### F.Y.I.

Most episodes of LBP tend to improve spontaneously (up to 85% of patients).

### **Point #3**

Given the successes of large joint arthroplasty in the treatment of disabling hip and knee arthritis, artificial lumbar disc replacement has been performed to treat DDD.

Since the implantation is performed through an incision in the low abdomen, allowing for mobilization of major iliac vessels in

front of the lumbar spinal column, participation of a general/vascular surgeon is strongly recommended.

LBP is relieved by the removal of the pain generator (disc), by the restoration of disc height and by the preservation of motion at the operated level.

### **Point #4**

Not all patients with LBP will benefit from lumbar spinal arthroplasty. Only a small subgroup of patients with discogenic LBP may be considered for the surgery. Diagnostic tools are imperative in confirming that the degenerated disc is the primary source of the pain.

### **Recommended investigations**

- Plain and dynamic spine X-rays (to rule out instability or fracture)
- Computerized tomography scan (to identify disc herniation, facet arthropathy)
- Magnetic resonance imaging (to identify epidural fibrosis from previous surgery)
- Discogram, facet block, nerve root block
- Bone densitometry (to rule out osteoporosis)

### Tidbit...

Lumbar spinal arthroplasty has been performed widely in Europe for three decades, but only recently in selected North American centres.

### **Point #5**

Retrospective European studies of patients who have received lumbar spinal arthroplasty with a followup of more than a decade suggested good patient satisfaction (> 90%) and pain relief. However, catastrophic complications, including hemorrhage from major iliac vessels and impotence due to injury

to the superior hypogastric plexus have been reported.<sup>2-5</sup>

**Keep in mind...**

Spinal arthroplasty is a treatment option for only a small subgroup of discogenic LBP patients.

**Point #6**

Despite the preliminary favourable outcome, caution must be exercised in recommending arthroplasty as a treatment option for discogenic LBP. Spinal arthroplasty is a complex procedure that demands special surgical training and careful patient selection.

**Limitations of surgery**

- The prestige and glamour of being a surgical pioneer combined with patient demand may result in inappropriate patient selection. This may lead to increased perioperative complications and poor long-term outcome.
- The cost effectiveness of surgical treatment of discogenic back pain has yet to be

addressed. Data comparing spinal fusion and nonoperative treatments suggest there may be no difference in long-term outcome.<sup>5</sup>

- It remains to be determined whether spinal arthroplasty is superior to fusion. Arthroplasty mimicks normal spinal biomechanics, but does not reproduce them.
- The long-term durability of the artificial disc remains unknown (10 to 15 years average for hip and knee arthroplasty).

**Contraindications for arthroplasty**

- Patients have not exhausted thorough nonoperative treatments
- Lumbar disc is not the primary source of pain (e.g., facet arthroplasty)
- Disc herniations with predominant radicular pain
- History of previous lumbar surgery, post-operative epidural fibrosis or arachnoiditis
- Vertebral fracture or infection; spinal instability
- Fever, obesity, previous abdominal surgeries

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## References

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