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CHAPTER 12

Disc Transplants, Replacements, and Gene Therapy: They Sound Good, But Do They Work?

The exciting new approaches for treatment of back pain are focused on replacing or repairing a painful and worn-out disc. The three major approaches are: 1) to replace the worn-out disc with an artificial disc; 2) transplant a healthy disc to replace the worn-out disc; or, 3) repair the disc using gene therapy.

Fusion of a disc space in the neck and low back is associated with accelerated breakdown of adjacent discs. In order to avoid this problem, it is theoretically advantageous to restore normal motion in the abnormal disc by replacing or repairing it.

Artificial discs are used to treat chronic disabling back pain secondary to disc degeneration.

Artificial hip and knee replacements work; why not have an artificial disc replacement?

Artificial disc replacement is the most developed of the attempts to restore the normal motion and weight bearing of a worn-out disc. In 2006, the first lumbar disc replacement

was approved by the U.S. FDA. Throughout the world, more than 10,000 patients have had this model of artificial disc placed in their low back. There are at least 10 other models of artificial discs being used throughout the world. At a recent seminar on innovations in spine surgery, I heard several discussions concerning the artificial disc. During the meeting I wrote down the following notes regarding disc replacement: “limited indications, technically difficult to perform, potential life- and limb-threatening complications, fixing failures is difficult, if a spinal fusion is required to repair a failed procedure it is difficult to perform, and the results of the fusion are not as good as would be expected.” I then heard a lecture from a spinal surgeon, whom I respect, on his experience with treating more than 100 patients with an artificial disc.

The ideal candidate for a lumbar disc replacement, according to this experienced surgeon, is a 40-year-old female who needs one moderately degenerated disc replaced because of back pain that has lasted more than one year despite treatment. She has no leg pain, is moderately active, and has not had previous surgery. In addition, the patient should be in good health, of normal weight, and a non-smoker. As you can imagine, there are very few people who fit into this description! He went on to say that people who are not good candidates for a disc replacement have some combination of the following: multiple degenerated discs; inactive lifestyle; overweight; have a herniated disc squeezed into the spinal canal causing leg pain; had previous abdominal or pelvic surgery; are over 60 years or under 21 years of age; is a smoker; and, have spinal stenosis, spondylolisthesis, scoliosis, facet joint arthritis, osteoporosis, or vascular disease. The list goes on! I know a lot more people who have one or more of these contraindications than I know who are ideal candidates for disc replacement.

I am a very experienced surgeon, and when I think a spinal operation is technically difficult, it truly is. And I think artificial disc replacement is a technically difficult operation. Every experienced spinal surgeon I talk to thinks so also. If the artificial disc is not perfectly placed, there is a high probability that it will migrate out of position. If it settles into the adjacent vertebral bodies, it will prevent any motion between them. If it migrates backward into the spinal canal it can cause leg pain or nerve damage.