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Drs. Scott Blumenthal, Richard Guyer & more: 6 Texas Back spine surgeons reflect on 20 years of artificial disc replacement

Written by Alan Condon / February 06, 2020 | Print | Email

This year marks the 20th anniversary of the first artificial disc replacement in the U.S.

Originating in Europe more than 30 years ago, Scott Blumenthal, MD, of Texas Back Institute in Plano, engaged in extensive research before performing the first artificial disc replacement in the country in 2000.

Now, the Center for Disc Replacement at Texas Back Institute performs about 400 artificial disc replacements a year.

Performed as an alternative to spinal fusion, artificial disc replacement — or total disc replacement — replaces a degenerated disc in the spinal column with an artificial motion device.

The procedure allows patients to retain mobility in the cervical and lumbar spine and has demonstrated great success in patients suffering from herniated discs and degenerative disc disease.

As of Feb. 5, 2020, the practice performed 3,664 artificial disc replacements: 1,494 cervical spine and 2,170 lumbar spine procedures.

Here, six spine surgeons from Texas Back Institute, including Dr. Blumenthal, share their insight on the development of the procedure and how they see it progressing in the future.

Question: How do you see total disc replacement developing in spine over the next five years?

Note: Responses are lightly edited for style and clarity.

Scott Blumenthal, MD: Lumbar disc replacement will continue to be performed in Centers of Excellence like the Center for Disc Replacement at Texas Back Institute and patients will continue to travel for this motion preserving procedure. However, LDR will continue to see slow growth because payers are still only covering a single level. We hope to see changes in LDR coverage over the next few years with coverage of 2-level or hybrid constructs covered by insurance. The use of CDR is growing and fast approaching to be the gold standard of care for cervical disc disease, which does not involve significant deformity. The coverage of 1- and 2-level CDR is nearly universal, which helps promote the adoption of disc replacement.

Richard Guyer, MD: CDR will become the new gold standard for symptomatic cervical radiculopathy. The adoption of LDR will continue to increase as fusion for degenerative disc disease becomes harder to receive insurance approval. Newer forms of motion preserving interbody implants will be developed to lessen the impact of adjacent segment disease with long fusions. Implants will migrate to those that have little or no artifact on MRI. Animal studies will prove that discs can be reproduced with scaffolds and stem cells.

Peter Derman, MD: I am optimistic the use of cervical and lumbar disc replacement rather than fusion will become more widespread. The literature supporting it is robust and constantly growing. As more surgeons become familiar with the data and surgical techniques, disc replacement should become the standard of care, with spinal fusion being the exception rather than the rule. Increased insurance coverage of multilevel as well as hybrid constructs will be necessary to facilitate this transition. I believe disc replacement will ultimately be utilized in the setting of deformity and more advanced degenerative pathology — whether this is possible with the current generation of devices

or requires the introduction of novel technology remains to be seen.

Jack Zigler, MD: Total disc replacements are the most extensively studied spinal implants we use. Long term follow-up studies continue to validate the safety and effectiveness of these devices over fusion as well as the protective effect on adjacent levels. Insurance penetration has improved steadily over the past 10 years. Surgeon reimbursement remains the largest obstacle to acceptance.

Over the next five years, reimbursement discrepancies between arthroplasty and spinal fusion procedures will diminish, encouraging surgeons to do more disc replacements as recovery and outcomes are more predictable than with fusions. Patient awareness will increase, and more patients will insist on motion-preservation technology. Lastly, improved materials and designs will produce even better outcomes than the first generation discs we are currently using and following scientifically.

Isador Lieberman, MD: Today disc replacement is a valuable tool in the treatment of painful disc degeneration of the cervical and lumbar spine. However, today's technology is limited in replicating the patient specific global alignment, the level-specific morphology and the level-specific kinematics. In the effort to preserve/protect adjacent level function over the lifetime of the patient, the future of disc replacement will be dependent on new technology that can custom tailor the fit and custom tune the biomechanics of a patient- and level-specific disc replacement.

This will serve to maintain spinal alignment, neutralize the deforming forces and arrest the degenerative cascade while retaining physiologic function. This will also fill the unmet need in the treatment of conditions such as spondylolisthesis and degenerative scoliosis, which are currently treated with some form of fusion.

Michael Duffy, MD: The advent of total disc arthroplasty has already begun to change the way patients view spinal fusion, particularly in the cervical spine. The peer-reviewed literature undeniably supports the use of ADR, both in the cervical and lumbar spines. As time progresses, the general public will likely become more aware of these favorable results, further shifting the pendulum toward utilizing artificial disc replacement.

Current ADR technology has advanced beyond the early designs, and there are multiple options for ADRs, all with level I data supporting their use. The current knowledge of design concepts will continue to evolve, potentially giving rise to a more perfect bearing apparatus and endplate design, which may altogether eliminate the concern for wear, debris and loosening, all of which are currently a minimal occurrence.

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