Artificial disc replacement as good or better than spinal fusion surgery (Audio)

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Spine surgeons at Washington University School of Medicine in St. Louis and other U.S. centers are reporting that artificial disc replacement works as well and often better than spinal fusion surgery. The two procedures are performed on patients with damaged discs in the neck.

Researchers found patients who received an artificial disc lost less motion in the neck and recovered faster than those who had a disc removed and the bones of the spine fused.

"Those who received the artificial disc either did equally as well or a little bit better than those who had fusion surgery," says K. Daniel Riew, M.D., a cervical spine surgeon at Washington University Orthopedics and Barnes-Jewish Hospital. "One of the most important findings was that people who got the artificial disc were able to preserve all of their motion."

A disc in the spine is similar to a jelly donut, with a squishy center surrounded by a tough outer portion. It functions like a shock absorber between the vertebrae. When a disc ruptures, or becomes herniated, the squishy disc tissue can spread into the spinal canal and press against nerves, causing numbness, weakness or pain.

For years, the surgery to treat cervical disc disease relieved pressure by removing the offending disc and then fusing the bones of the spine together. Surgery to implant an artificial disc also removes the damaged disc, but instead of using metal rods, screws and bone grafts to fuse bones together, the surgeon replaces the disc with an implant.

Patients in the study were randomly assigned to receive either the BRYAN Cervical Disc or standard fusion surgery. Ultimately, 242 received the artificial disc, and 221 had spinal fusion. Improvement following surgery was measured with a tool called the neck disability index (NDI). Two years post surgery, patients in both groups had improved NDI scores. Both had less neck and arm pain and were less likely to experience numbness. Overall, the surgery was rated as successful in 83 percent of the patients who received artificial discs and 73 percent of those who had fusion surgery (230 vs. 194). Part of that difference, Riew says, can be explained by better motion in the neck for those who had artificial discs implanted.

He says the neck is always slightly restricted following spinal fusion surgery. Since bones in the neck have been fused together, it is impossible to regain full range of motion. But the defect is subtle.

"Fusion adds a small amount of stress in the spine above and below the fusion site, so bone can break down a little faster than normal," Riew explains. "If the patient is a young person, then they may need another operation in 20 or 30 years. The hope with artificial cervical disc replacement is the preserved motion may protect against additional stress at other levels of the spine."

In the short term, Riew says most patients receiving artificial disc replacement surgery recovered faster and got back to normal life sooner than fusion surgery patients.

"They didn't need to wear a neck brace after surgery," he says. "If they had a job, they returned to work faster. And many had a resolution of their pain faster than fusion patients. With a spinal fusion, there are some pain and activity restrictions until the bone is fully incorporated, but with an artificial disc, as soon as the disc is in, it's 'good to go.'"

Riew, the Mildred B. Simon Distinguished Professor of Orthopaedic Surgery, professor of neurological surgery and chief of the cervical spine service for Washington University Orthopedics, says people from outdoorsmen to couch potatoes have seemed to do well following implantation of artificial discs. Last summer, he implanted an artificial disc into a

professional baseball player's cervical spine. That player plans to return to the diamond and continue his career this season.

But at the moment, the discs are not an option for some patients. Those with arthritis or disc disease at multiple levels in the spine are not good candidates. A barrier for those who are good candidates is that many insurance companies don't yet cover them.

More information: Heller JG, Sasso RC, Papadopoulos SM, Anderson PA, Fessler RG, Jacker, RJ, Coric D, Cauthen JC, Riew KD. Comparison of BRYAN cervical disc arthroplasty with anterior cervical decompression and fusion: clinical and radiographic results of a randomized, controlled clinical trial. *Spine*, vol 34 (2), pp. 101-107. Jan. 2009

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