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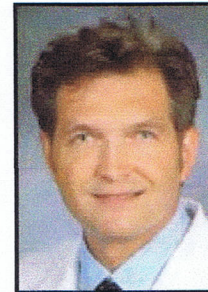
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In My Opinion...

Plate Systems Improve Fusion Rates for Degenerative Spinal Disease

"Plate instrumentation... is associated with significantly better fusion rates and thus a lower likelihood of reoperation."

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Degenerative spinal disease usually occurs from cumulative wear and tear on the spine. Symptoms include pain in the shoulder blades and/or neck, arm discomfort, and (less often) difficulty with hand dexterity or walking. Initially, the disease is managed conservatively, using physical therapy, medication for pain and inflammation, and possibly neck appliances. However, if conventional methods are unsuccessful, surgery may be considered.

The mechanical goals in surgery are aimed at decompressing the nerves and spinal cord, stabilizing the spine, and restoring spinal alignment. The hope is that achieving these goals also will relieve the patient's pain. Surgical procedures can be performed from either the front or back. In most frontal procedures, fusion occurs automatically (when the disc is removed), but fusion is an option for surgery done from the back. Fusion and instrumentation can be avoided in a small subset of patients, including those who require only decompression or laminectomy.

If fusion is a goal, surgeons must determine the appropriate stabilization method. Should a plate or bone graft be used? Would a bracing device be preferable? Some surgeons use bone from a cadaver or the patient's hip, whereas others may select metal grafts. Most plates are titanium, but absorbable material is becoming more popular.

The Emergence of Plate Systems

Although plate instrumentation is expensive, it is associated with significantly better fusion rates and thus a lower likelihood of reoperation. It stabilizes the spine quickly—enabling faster mobilization—and it avoids the use of external collars, which are poorly tolerated by patients. Such benefits will likely reduce the overall costs associated with this disease, more than offsetting the expense, and research demonstrates that complications are rare. The greatest drawback is that foreign material must remain in the body for the long term.

In a retrospective meta-analysis published in the April 2007 *Journal of Neurosurgery: Spine*, my colleagues and I conducted a study showing that, among the five major types of cervical spine surgery, plate-system procedures have significantly higher fusion rates at all disc levels. After reviewing 21 investigations in the analysis, we found that for procedures involving a single disc, the fusion rate was up to 12% higher when plates were used. For 2- and 3-disc levels, the rates were about 13% and 30% higher, respectively.

Identifying Appropriate Candidates

Ideal candidates for plate systems include patients with localized neurological problems, such as arm pain, confirmed by an MRI. Other conditions that commonly go along with arm and hand pain, such as myocardial infarction and carpal tunnel syndrome, have to be ruled out. For example, individuals with right-sided arm weakening plus a right-sided herniated disc at the corresponding cervical level would be good candidates. Conversely, patients with neck pain only and no arm discomfort would not be good candidates.

The lack of training in plate instrumentation, especially in the private surgical sector, has hindered its use. However, such training is now commonplace for new specialists in the field. Physicians and patients interested in learning more about this option may contact a fellowship-trained spinal surgeon or obtain information from the North American Spine Society (<http://www.spine.org/>) or the American Association of Neurological Surgeons (<http://www.aans.org/>).

Even as final results of studies using absorbable plate material are emerging, more research is still underway. The hope is that artificial discs will preserve motion; if they do, fusion surgery may become unnecessary for many patients with neck and arm pain. Another development, the biological disc replacement, is under investigation in our laboratory. The procedure involves removing cells from the patient's disc and growing them into mature discs. At a later point, the defective disc will be removed and the new biological replacement disc implanted. Preclinical studies are being performed in animals, and if validated, this procedure could be ideal because no foreign materials would remain inside patients.

Roger Härtl, MD has indicated to Physician's Weekly that he has or has had the following financial interest: Synthex, Abbott Spine, and Integra.