

Direction of the Evidence

What is the failure rate after lumbar disc replacement surgery?

By Ron Feise, DC

Harrop JS, Youssef JA, Maltenfort M, Vorwald P, Jabbour P, Bono CM, Goldfarb N, Vaccaro AR, Hillbrand AS. Lumbar adjacent segment degeneration and disease after arthrodesis and total disc arthroplasty. *Spine* 2008;33:1701-7.

SYNOPSIS: This was a systematic review to assess the impact of arthrodesis, or total disc replacement, on the incidence of adjacent segment degeneration (ASDeg) and symptomatic adjacent segment disease (ASDis). The search period was 1996 to 2006.

Twenty-seven articles met the inclusion criteria. All of these, however, were low-quality studies (class III or IV).

RESEARCH

QUALITY: Overall, this study had reasonable methodological rigor.

Quality detail: 1) appropriate design; 2) a clearly focused question; 3) an appropriate inclusion criteria; 4) a clearly described search of the literature; 5) a lack of independent reviewers selecting and appraising the studies; 6) an assessment of the studies; 7) a description of the data extraction process; and 8) a conclusion that flowed from the evidence.

CONCLUSION: The data from the low-quality studies could not establish which

surgical procedure yielded less ASDis or ASDeg. Future research with better quality is needed to establish the relationship between lumbar arthroplasty and fusion and ASDeg and ASDis.

COMMENTS: *Hypothetically, lumbar disc arthroplasty should serve to preserve motion and thereby ultimately avoid stress and degeneration of the adjacent segment. It is expected that disc replacement would be better than fusion. Recent research, however, suggests serious shortfalls with disc replacement. A 3-year follow-up period found that patients who received lumbar disc replacement experienced a high failure rate (33% experienced serious postoperative pain).¹ In another recent study, Shim reported a high progression rate of facet joint osteoarthritis for prosthesis in more than 32% of all patients.² This high incidence of facet degeneration after an average follow-up of less than 4 years was too short to be explained by the natural course of degeneration. In a study examining surgical disc replacement after 17 years, there was a 60% rate of spontaneous ankylosis and a reoperation rate of 11%.³ The extremely high rate of spontaneous ankylosis (unintended*

surgical fusion of sorts) is opposite from the result this surgical scheme is attempting to produce. Moreover, a systematic review by an international medical team suggests that the data on disc replacement argue for caution by patients and surgeons.⁴

Warning. Practitioners should not automatically use information from research studies (especially abstracts) to make decisions about patient care, because health care literature suffers from inconsistent quality and frequently distorts research findings. Before relying on the findings of a research study, a practitioner should perform a critical appraisal to determine whether the conclusion is supported by the study's data. He or she should also locate and examine previous relevant research in order to integrate the current findings and form a conclusion based upon the preponderance of quality evidence. Even conclusions from multiple studies do not provide a definitive answer. Rather, they indicate the direction of the evidence. ■

Direction of the Evidence

This review is an excerpt from Direction of the Evidence, published by the Institute of Evidence-Based Chiropractic, whose aim is the integration of science into chiropractic practice in order to improve patient outcomes. Dr. Feise can be reached at rjf@chiroevidence.com.

References

1. Siepe CJ, Korge A, Grochulla F, Mehren C, Mayer HM. Analysis of post-operative pain patterns following total lumbar disc replacement: results from fluoroscopically guided spine infiltrations. *Eur Spine J* 2008;17:44-56.
2. Shim CS, Lee SH, Shin HD, Kang HS, Choi WC, Jung B, Choi G, Ahn Y, Lee S, Lee HY. CHARITE vs. ProDisc: a comparative study of a minimum 3-year follow-up. *Spine* 2007;32:1012-1018.
3. Putzier M, Funk JF, Schneider SV, Gross C, Tohtz SW, Khodadadyan-Klostermann C, Perka C, Kandziora F. Charite total disc replacement: clinical and radiographical results after an average follow-up of 17 years. *Eur Spine J* 2006;15:183-195.
4. Gibson JN, Waddell G. Surgery for degenerative lumbar spondylosis: updated Cochrane Review. *Spine* 2005;30:2312-20.