

Title

Cervical Total Disc Replacement: Available Implant Size Matters

Background

While restoration of disc height of a collapsed, degenerated segment is a goal of TDR surgery, there are potential problems with over-distracting the segment with an implant. With respect to implant height, one report showed in 36% of a study population, the height of the cervical disc space was less than the minimal height of available TDRs, which is generally 5 mm.

Research question

The purposes of this study were to: 1) analyze the heights of cervical disc spaces to be replaced with a TDR; 2) measure the heights of the disc spaces adjacent to the treated level, and 3) investigate the frequency of use of a smaller height TDR implant when available.

Design

Post hoc analysis of data from an FDA IDE trial.

Methods

An independent radiology core lab measured disc heights of 164 levels treated with TDR and 261 adjacent non-operated levels from C3-4 to C6-7. By level, the recorded disc height was the average of the anterior and posterior disc heights. The device height (4, 5, or 6 mm) selected by the operating surgeon in the FDA IDE trial was recorded and used in the current study.

Results

Of the 261 adjacent levels, 55% of disc spaces had a height of 4 mm or less. For levels to be replaced with a TDR, 82% were less than 4 mm in height. In the FDA trial in which a 4 mm device was available, it was selected for use in 38% of patients, a 5 mm device was used in 53% and a 6 mm implant was used in 9% of patients.

Discussion

Many disc levels to receive a TDR had a height of <4mm. Even among the adjacent segments, 55% were <4 mm in height, suggesting that motion preserving implants of greater heights may have the potential to overdistract the disc space. In a recent FDA IDE trial, which offered a 4mm TDR implant height, this was selected in 38% of patients, suggesting surgeon preference for the smaller implant in an appreciable number of patients. Further investigation is warranted to determine if the lower height implants are related to more favorable clinical and/or radiographic results.