TO THE EDITOR: We read with great interest the article by Dr. Matgé and colleagues (Matgé G, Berthold C, Gunness VRN, et al: Stabilization with the Dynamic Cervical Implant: a novel treatment approach following cervical discectomy and decompression. J Neurosurg Spine 22:237–245, March 2015). The authors reported on 53 patients with cervical disc disease who were treated with anterior discectomy and Dynamic Cervical Implant (DCI) stabilization. The results were promising and comparable with those of the currently available cervical artificial discs (CADs) on the market. However, there are distinct differences between these devices that need to be clarified.

The basic structure of the DCI is far less sophisticated than CADs. Most CADs are composed of two pieces that form a ball-and-trough mobile joint. The DCI is a piece of metal bent into a U shape that, after insertion into the disc space, provides elasticity during flexion and extension of the neck. The spring-like design of the DCI naturally facilitates extension (like a spring) and limits flexion (like a bumper). In contrast to the DCI, the common CAD is a joint free of any internal force and totally depends on surrounding musculatures during motion. This inherent discrepancy is likely to cause less range of motion (ROM) during flexion and more ROM during extension (Fig. 1). Therefore, the statement, “Another unique feature is the ability of the device to function as a shock absorber, which allows axial compression in flexion, and limited extension from the neutral position, thereby protecting the adjacent levels from excessive stresses,” may not be accurate. In our opinion, the true merit of the DCI is that it is a pro-lordotic device that provides modest anterior column support (certainly less than cages but more than most artificial discs). Whether this unloads the facet joints remains uncertain.

Furthermore, the authors state in their conclusion that the potential advantages of the DCI over anterior cervical discectomy and fusion (ACDF) and cervical total disc replacement include minimizing “the development of ASD [adjacent-segment disease].” We concur with the authors that the presence of only 1 case of symptomatic ASD at 24 months after implantation of a DCI is encouraging, compared to many other series. The clinical evidence provided in the article, however, is not sufficient to support this conclusion. To date, several prospective, randomized, controlled trials comparing 1- or 2-level CADs to ACDF have yielded no conclusion on the issue of decreasing rates of ASD.

The development and application of the DCI in the treatment of cervical spondylosis is cutting edge, and the authors should be commended for sharing their experi-
ene with worldwide readers of the Journal of Neurosurgery: Spine. The DCI has a unique feature of allowing only flexion and extension while completely eliminating translation, axial rotation, and lateral bending, which all other CADs do. Whether this in-between characteristic has a role in the treatment paradigm of cervical degenerative disc disease and spondylosis remains uncertain and requires more clinical data for evaluation.

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DISCLOSURE
The authors report no conflict of interest.

References

Response
We thank Wang and colleagues for their comments on differences between the DCI and CADs. The spring-like design of the DCI with axial stiffness facilitates extension (like a spring with a defined rigidity) and limits flexion (like a bumper with an incorporated stop when both anterior ends are touching), permitting a shock-absorber effect inside the device rather than a shock transmission only to the endplates. The posterior rounded and uncompressible portion of the device maintains disc and foraminal height together with facet unloading. The device also allows some facet joint translation during flexion and extension, as seen on dynamic radiographs.

Biomechanical studies by Auerbach and Rundell1 and Welke et al.3 did not show excessive stresses on adjacent vertebral levels, as seen also in FXA (functional x-rays analyses) studies by Herdman et al.2 The MCR (mean center of rotation) of the operated segment moved slightly upwards to the top endplate in contact with the DCI, whereas the MCR of both adjacent segments showed no shift at all during the follow-up period. Thus, we did not observe any radiological signs of segmental degeneration in either adjacent segment after DCI surgery (with regard to MCR, ROM, and disc height at both adjacent segments). Some of the key points of the preliminary biomechanical results make the DCI a more attractive option for patients who require cervical arthroplasty.