Vertebral Body Stapling vs. Bracing for Patients with High-risk Moderate Idiopathic Scoliosis

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Study design: Retrospective review

Objective: To compare results of vertebral body stapling (VBS) versus bracing for patients with moderate idiopathic scoliosis using identical inclusion criteria.

Introduction: VBS has been presented as an alternative treatment strategy for patients with adolescent idiopathic scoliosis. Preliminary results of VBS cohorts have been published. The efficacy of bracing for AIS has been questioned, and the issue of compliance and the psychosocial problems add to the desire for additional alternatives to bracing as a treatment. This study reports a retrospective comparison study of VBS versus bracing only for patients with moderate idiopathic scoliosis using identical inclusion criteria.

Methods: We retrospectively reviewed 43 of 49 patients (88%) with idiopathic scoliosis treated with VBS for a minimum of 2 years. Inclusion Criteria:

1) Diagnosis of idiopathic scoliosis;
2) age at least 8 years at time of first visit;
3) curve size of 25-44° at first visit; and
4) Risser sign of 0 or 1 at first visit.

Thoracic curves were stapled using a thoracoscopic technique utilizing CO₂ insufflation and single lung ventilation. Lumbar curves were stapled using a minimally invasive retroperitoneal exposure. All staples were inserted under fluoroscopic control. Failure was defined as curve progression greater than 10° at follow-up.

The bracing cohort was a consecutive series of patients derived from the Göteborg bracing database who were treated between 1968 and 1994 and queried to meet identical inclusion criteria as the VBS group. From this bracing database, 165 curves in 129 patients (with 36 patients having both thoracic and lumbar curves) were identified.

Results: The two cohorts were thought to be comparable with the exception of age at the start of treatment. The average age of the VBS group vs. the bracing group was 10.5 years vs. 12.7 years, respectively (p<.0001). Average curve size was 31 vs. 32° (p=.4) and average follow-up was 41 vs. 43 months (p=.09). For thoracic curves 25-34°, VBS had a success rate of 80% versus 63% for bracing (p=.2). In thoracic curves 35-44°, VBS and bracing both had a poor success rate (18% and 51%, respectively) (p=.08). For lumbar curves 25-34°, VBS had a 77% success rate versus only 63% for bracing (p=.5), and for lumbar curves 35-44°, VBS had a 67% success rate versus 60% for bracing (p=1.0). Adjustment for age to match in both cohorts (average age 10.5 years) showed more progression in the brace group results but did not change the conclusions.

Conclusion: In this comparison of two cohorts of patients with high-risk moderate idiopathic scoliosis (25-44°), there were no statistical differences in treatment results. However, the trends may be considered clinically important. For treatment of thoracic and lumbar curves 25-34°, the results of VBS for curve stabilization and improvement showed a trend towards slightly better success than those treated with bracing. With the exception of thoracic curves 35-44°, the data suggest that VBS could be used as an alternative to bracing for patients who are struggling with the ramifications of brace wear. For thoracic curves 35-44°, additional strategies are needed such as a posterior hybrid rod and or anterior tethering technology.