



Adult Spinal Deformity Knowledge in Orthopedic Spine Surgeons: Impact of Fellowship Training, Experience, and Practice Characteristics

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Abstract

Study Design: Survey study.

Objective: The purpose of this paper was to assess the level of adult spine deformity (ASD) knowledge among orthopedic spine surgeons and identify areas for improvement in spine surgery training.

Summary of Background Data: ASD is increasingly encountered in spine surgery practice. While ASD knowledge among neurosurgeons has been evaluated, ASD knowledge among orthopedic spine surgeons has not previously been reported.

Methods: A survey of orthopedic spine surgeon members of North American Spine Society (NASS) was conducted to assess level of spine surgery training, practice experience, and spinal deformity knowledge base. The survey used was previously completed by a group of neurologic surgeons with published results. The survey used 11 questions developed and agreed upon by experienced spinal deformity surgeons.

Results: Complete responses were received from 413 orthopedic spine surgeons. The overall correct-answer rate was 69.0%. Surgeons in practice for less than 10 years had a higher correct-answer rate compared to those who have practiced for 10 years or more (74% vs. 67%;

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$p = .000003$). Surgeons with 75% or more of their practice dedicated to spine had a higher overall correct rate compared to surgeons whose practice is less than 75% spine (71% vs. 63%; $p = .000029$). Completion of spine fellowship was associated with a higher overall correct-answer rate compared to respondents who did not complete a spine fellowship (71% vs. 59%; $p < .00001$).

Conclusions: Completion of spine fellowship and having a dedicated spine surgery practice were significantly associated with improved performance on this ASD knowledge survey. Unlike neurosurgeons, orthopedic spine surgeons who have practiced for less than 10 years performed better than those who have practiced for more than 10 years. Ongoing emphasis on spine deformity education should be emphasized to improve adult spinal deformity knowledge base.

Keywords: Spine deformity; Sducation; Knowledge base

Introduction

Most orthopedic spine surgeons complete postgraduate fellowship training in spine surgery prior to entering independent practice [1]. The majority of spine surgery fellowships include education in the evaluation and management of spinal disease due to degenerative, traumatic, and malignant processes in addition to spinal deformity. The exposure to spinal deformity varies widely among postgraduate spine surgery training programs, encompassing a range of 5% to 50% of the spine surgery fellowship experience [2].

Adult spinal deformity (ASD) is increasingly encountered in modern spine surgery practice [3]. ASD patients experience inferior health-related quality of life (HRQOL) compared with the general population [4] and may experience substantial benefit from spine surgical intervention in carefully selected patients. As life expectancy increases and the aging population remains active, the number of patients undergoing surgical treatment for spine deformity will also likely continue to increase [5].

To optimally treat ASD, spine surgeons must learn and understand basic spinal deformity principles including coronal and sagittal plane alignment, spinopelvic parameters, clinical spine deformity evaluation, indications for spinopelvic fixation, and methods of spinal and spinopelvic instrumentation [6–9]. According to guidelines established by Herkowitz et al., these principles should be introduced during orthopedic residency and further emphasized during postgraduate fellowship training [10]. Because of the complex nature of treating spine deformity [11–13], more than 90% of orthopedic surgery and neurosurgery residency program directors believe surgeons from either specialty who want to perform spine deformity surgery must complete a spine surgery fellowship [1]. However, the effect of fellowship training on ASD knowledge in orthopedic surgeons is incompletely understood.

Although ASD knowledge among practicing neurosurgeons has been studied [9], ASD knowledge among practicing orthopedic spine surgeons has not previously been reported. The purpose of this study was to assess the level of ASD knowledge among orthopedic spine surgeons and

to identify areas for improvement in orthopedic spine surgery training.

Methods

An online survey was distributed to 2,222 orthopedic spine surgeon members of North American Spine Society (NASS) to assess level of spine surgery training, practice experience, and spinal deformity knowledge base. The survey was distributed via surveymonkey.com (SurveyMonkey, Palo Alto, CA) from March to May 2015.

The survey used was previously completed by a group of 7,781 neurologic surgeons (18.7% response rate) with published results in the *Journal of Neurosurgery: Spine* [9]. The survey consisted of 14 multiple-choice questions (Appendix 1), which were developed by Clark et al. The survey was administered to an additional 10 expert spine deformity surgeons for validation. The inter-rater reliability among the 10 expert spine deformity surgeons was 85.4% [9]. The first three questions focus on training and practice experience. The remaining 11 questions were knowledge-based questions (Fig. 1). These questions were subgrouped into 5 categories: (1) radiology/spinopelvic alignment; (2) health-related quality of life (HRQOL); (3) surgical indications; (4) operative technique; and (5) clinical evaluation. Selected questions were subgrouped into more than one category.

Demographic variables were dichotomized for analysis. Responses to “time in practice” were grouped into “<10 years” and “≥10 years.” Responses to “percent of practice dedicated to spine surgery” were grouped into “<75%” and “≥75%.” Responses to knowledge base questions were recorded as correct or incorrect.

Differences in the rate of correct answers (%) between groups were compared using chi-square analysis based on dichotomized participant demographic characteristics including years of practice, completion of a spinal surgery fellowship, and percentage of practice comprising spinal surgery with SPSS (IBM Corp., Armonk, NY). Probability values <.05 were deemed statistically significant.

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