



Articles of Interest - Scoliosis Surgery

Coe, J. D.; Arlet, V.; Donaldson, W.; Berven, S.; Hanson, D. S.; Mudiyan, R.; Perra, J. H. & Shaffrey, C. I. (2006), 'Complications in spinal fusion for adolescent idiopathic scoliosis in the new millennium. A report of the Scoliosis Research Society Morbidity

STUDY DESIGN:

The Morbidity and Mortality database of the Scoliosis Research Society (SRS) was queried as to the incidence and type of complications as reported by its members for the treatment of adolescent idiopathic scoliosis (AIS) with spinal fusion and instrumentation procedures regarding surgical approach (anterior, posterior, or combined anteriorposterior) during a recent 3-year period.

OBJECTIVE:

To evaluate the incidence of surgeon-reported complications in a large series of spinal fusions with instrumentation for a single spinal deformity diagnosis and age group regarding surgical approach.

SUMMARY OF BACKGROUND DATA:

The SRS has been collecting morbidity and mortality data from its members since its formation in 1965 with the intent of using these data to assess the complications and adverse outcomes (death and/or spinal cord injury) of surgical treatment for spinal deformity. Surgical approaches to the management of treatment of AIS have a measurable impact on efficacy of correction, levels fused, and operative morbidity. However, there is a lack of consensus on the choice of surgical approach for the treatment of spinal deformity.

METHODS:

Of the 58,197 surgical cases submitted by members of the SRS in the years 2001, 2002, and 2003, 10.9% were identified as having had anterior, posterior, or combined spinal fusion with instrumentation for the diagnosis of AIS, and comprised the study cohort. All reported complications were tabulated and totaled for each of the 3 types of procedures, and statistical analysis was conducted.

RESULTS:

Complications were reported in 5.7% of the 6334 patients in this series. Of the 1164 patients who underwent anterior fusion and instrumentation, 5.2% had complications, of the 4369 who underwent posterior instrumentation and fusion, 5.1% had complications, and of the 801 who underwent combined instrumentation and fusion, 10.2% had complications. There were 2 patients (0.03%) who died of their complications. There was no statistical difference in overall complication rates between anterior and posterior procedures. However, the difference in complication rates between anterior or posterior procedures compared to combined procedures was highly significant ($P < 0.0001$). The differences in neurologic complication rates between combined and anterior procedures, as well as combined and posterior procedures were also highly statistically significant ($P < 0.0001$), but not between anterior and posterior procedures.

CONCLUSIONS:

This study shows that complication rates are similar for anterior versus posterior approaches to AIS deformity correction. Combined anterior and posterior instrumentation and fusion has double the complication rate of either anterior or posterior instrumentation and fusion alone. Combined anterior and posterior instrumentation and fusion also has a significantly higher rate of neurologic complications than anterior or posterior instrumentation and fusion alone.

DiCindio, S.; Theroux, M.; Shah, S.; Miller, F.; Dabney, K.; Brislin, R. P. & Schwartz, D. (2003), 'Multimodality monitoring of transcranial electric motor and somatosensory-evoked potentials during surgical correction of spinal deformity in patients with cerebral palsy and other neuromuscular disorders.', Spine 28(16), 1851--5; discussion 1855 – 6.

STUDY DESIGN:

This prospective, descriptive study determined the reliability of transcranial electric motor and posterior tibial nerve somatosensory-evoked potentials in children with neuromuscular scoliosis.

OBJECTIVE:

To assess the applicability of transcranial electric motor and posterior tibial nerve somatosensory-evoked potentials during surgical correction of neuromuscular scoliosis, particularly with cerebral palsy-related deformity.

SUMMARY OF BACKGROUND DATA:

During corrective spinal surgery for neuromuscular scoliosis, intraoperative multimodality spinal cord monitoring is recommended. There exist conflicting, retrospective studies regarding the reliability of spinal cord monitoring in patients with neuromuscular scoliosis. **METHODS:** Transcranial electric motor potentials and posterior tibial nerve somatosensory-evoked potentials were monitored in all patients presenting for spinal fusion between 2000 and 2001. Anesthesia was standardized for all patients.

RESULTS:

There were 68 patients subdivided into two subject groups. Group I consisted of 39 patients with neuromuscular scoliosis associated with cerebral palsy, and Group II consisted of 29 children with neuromuscular scoliosis due to a disease process other than cerebral palsy. Five of the 68 patients had significant amplitude changes in 1 or both monitoring methods during surgery relative to baseline. Of these, one had permanent neurologic deficit despite standard intervention. Somatosensory-evoked potentials were monitored successfully in 82% of the cerebral palsy and 86% of the noncerebral palsy patients. Transcranial electric motor-evoked potentials, on the other hand, were monitorable in 63% of patients with mild or moderate degrees of cerebral palsy and 39% of those with severe involvement. Eighty-six percent of those with noncerebral palsy-related neuromuscular scoliosis had recordable motor-evoked potentials at baseline.

CONCLUSION:

Both transcranial electric motor and posterior tibial nerve somatosensory-evoked potentials can be monitored reliably in most patients with neuromuscular scoliosis. Those with severe cerebral palsy present the greatest challenge to successful neurophysiologic monitoring.

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