

Outcome of anterior cervical fusion surgery: 16 year experience

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Introduction

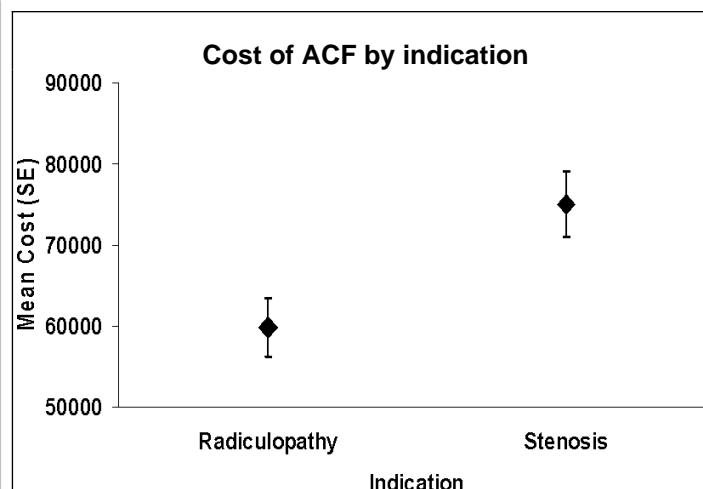
Anterior cervical fusion (ACF) is a commonly performed surgery in various centers throughout the country. A range of outcomes and complications have been reported in the literature. We decided to look at our institutional data to assess how we compared with other national groups in terms of outcomes, complications and cost.

Methods

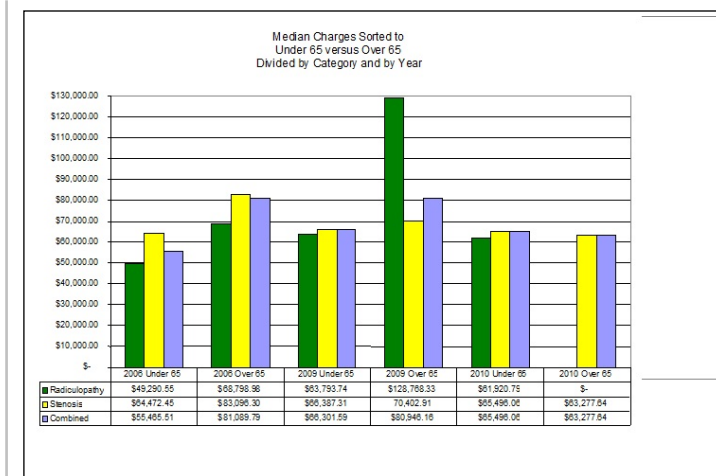
We retrospectively identified 655 patients who had undergone ACF by a single neurosurgeon from July 1994 to March 2010. Patient data sheets were collected preoperatively and at 6 and 12 weeks postoperatively. The indications for surgery were divided into 2 groups: radiculopathy and stenosis. Outcomes were assessed as either satisfactory (symptomatic improvement) or unsatisfactory (failure of symptomatic improvement or development of complication). Nonparametric methods were used to compare costs by year, indication, age and gender. Cost was defined as total charges incurred for surgery as well as total hospital stay and were adjusted to 2010 cost of living. Box and whisker plots were used to describe the distribution of costs within these groups of patients. The middle line of the box corresponds to the median with the top and bottom lines representing the inter-quartile range. The whiskers represent the minimum and maximum values and the diamond represents the mean. P-values less than 0.05 were considered significant.

Results

Out of the 655 patients, 268 (41%) had radiculopathy and 338 (52%) had stenosis. Often patients would have components of both, but it was the dominant symptom that was treated. The remaining 49(7%) were classified as "other" (trauma, tumor, infection) and are not further discussed here.



Satisfactory outcomes were measured in each group and reported to be 246 (92%) and 285 (85%) in patients with radiculopathy and stenosis respectively. Overall complication rate for ACF was 7%. Complication rates were reported to be 9(3%) and 32(9%) in patients with radiculopathy and stenosis respectively. Adjacent level disease recorded over mean available followup of 7 years and neurological worsening measured at 12 weeks postoperatively, occurred in 5% and 1% of the radiculopathy group respectively, compared to 3% and 1.1% in the stenosis group. Failed fusion, vocal cord paralysis and dysphagia, each occurred in 0.7% of patients with radiculopathy, compared to 1.8%, 0.6% and 1.5% respectively in the stenosis group. There was no statistically significant difference in the complication rates between the two groups. The difference in cost was significant when comparing indications ($p=0.002$). Patients with stenosis had higher costs compared to patients with radiculopathy. Also, the difference in cost was significant for the two age categories ($p=0.011$). Patients less than 65 had lower costs compared to patients over 65.



No differences in cost were detected over the years ($p=0.188$) or when comparing males and females ($p=0.788$).

Conclusions

The main limitation of this analysis was the lack of an objective neurological scale to measure outcome. Our cost analysis demonstrated a significant difference in overall cost of ACF depending on the indication of the procedure and age of the patient population. It is safe to assume that patients older than 65 are likely to encounter more complications and are slower to recover after ACF due to their age and comorbidities. Another limitation was the inability to determine whether age over 65 or stenosis, or both, were the main reason behind increased cost, since patients of advanced age were more likely to have a predominantly stenosis-based cervical pathology. Despite its limitations, we feel that this study provides valuable information about the variability of outcome of a very common neurosurgical procedure and forms the basis of a strong prospective study to be conducted in the future.

References

- Lemcke et al. Outcome After Anterior Cervical Discectomy and Arthrodesis: A Clinical Study of 368 Patients. Neurosurgery Quarterly 2010. 20(1):8-14.