Anterior Cervical Plate Position and Clinical Outcomes after Anterior Cervical Discectomy and Fusion

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Introduction

The use of anterior plates has become standard in anterior cervical discectomy and fusion (ACDF) procedures. Previous biomechanical research has demonstrated no effect of plate positioning in the coronal plane on structural integrity. The aim of this study was to evaluate radiographic positioning of the anterior plate in the coronal plane and follow the clinical results utilizing a variety of parameters in a group of patients after ACDF.

Materials and Methods

- A total of 71 pateints who underwent ACDF for various pathologies consistent with accepted indications were followed clinically utilizing a variety of outcome measures as well as via initial postoperative AP radiograph of the Cervical Spine
- The postoperative angulation in the coronal plane from the spinal axis was measured as demonstrated in Figure 1.
- All procedures performed by a single surgeon

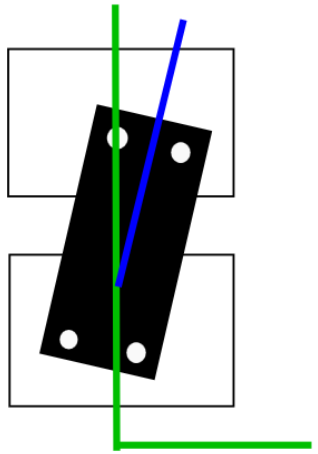

Figure 1 demonstrating the coronal plane angulation of the anterior plate measured between the green and blue lines.

Materials and Methods (cont.)

- Pre and postoperative outcomes criteria recorded included: nerve distribution of radicular pain, Nurick score, pain scale score, usage of narcotic pain medication, and location/severity of any motor deficits.
- Follow up visits occurred at the two week, three month, six month, and one year marks in the postoperative period.

Results

- Mean angulation of anterior plate on the AP radiograph was 2.657 degrees with a range of 0 to 9 degrees.
- No significant relationship between plate angle and postoperative Nurick score when controlling for BMI, gender, and age (p=0.822). Also, there was no significant relationship to plate angle and the change in Nurick scores when the above controls were applied (p=0.238).
- No significant relationship between plate angle and pain scale, pain distribution, and motor deficit when the above control were applied (p values of 0.6734, 0.347, 0.0967)
- Utilizing odds ratios, the odds of using narcotics postoperatively as plate angle increased did not significantly differ from 1.
- A summary of results can be viewed in Table 1.

Outcome Measure	Result
Mean Age (yrs)	57.49
Mean BMI	29.12
Mean Plate Angle (deg)	2.657
Plate Angle Range (deg)	0-9
Angle/Postop Nurick score	p=0.822
Angle/Δ Nurick	p=0.238
Angle/ Pain Distribution	p=0.348
Angle/Motor Deficit	p=0.096
Angle Increase/Narc Odds	OR=1.293, p=0.764

Table 1 summarizing the results of Plate Angle when compared to various outcome measures.

Discussion

No statistical relationship was demonstrated between any of the outcome measures utilized in this study and plate angle. This is consistent with previous biomechanical research showing no effect on integrity of the construct. Limitations of this study include a narrow range of plate angles, limited follow up time, and subjective outcomes measures. In future studies, distance of the plate from the vertebral endplate could also be included when analyzing plate position.

Works Cited

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