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Influence of Plate Position on Fusion Time and Clinical Outcomes after Anterior Cervical Interbody Fusion

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– Abstract –

Study Design: This was a retrospective study to evaluate anterior cervical interbody fusion with plates.

Objective: To examine the degree of angulation and translation after an anterior interbody fusion, using anterior plate fixation, upon the fusion rate and clinical outcome.

Summary of Literature Review: Anterior cervical interbody fusion with plate allows immediate rigid internal fixation after decompression and bone grafting

Materials and Methods: 65 cases had an anterior interbody fusion on the cervical spine, using an anterior approach and Smith-Robinson 's method, between January 1998 and August 2003. Of these, 41 cases, which could be followed up for at least one year, were selected. There were 26 and 15 males and females, respectively, with an average age of 43.5 and mean follow up period of 2.1 years. 15 cases underwent an operation due to dislocation or fracture of the cervical spine due to trauma, and 26 due to cervical diseases. The angulation and translation of the plate was measured by postoperative X- rays. The fusion rate was also determined by the follow up X- rays. The Chi- squared test was used to analyze the data.

Results: Bony fusion was obtained in all cases. Two patients developed hoarseness and one showed torticollis, but all had recovered by the follow up. The average angulation of the plate and translation were 6.2 degrees and 3.21mm, respectively, but there was no significant difference of the interbody fusion period due to angulation and translation of the plate or in the improvement of the clinical outcomes.

Conclusion: In the cases of anterior interbody fusion of the cervical spine, the angulation and translation of the plate had no influence on the fusion time and clinical outcomes. Long term studies and research will be needed to bring about clinically more valuable data.

Key Words: Cervical spine, Anterior interbody fusion, Plate angulation, Plate translation

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* 2003

1955 Robinson Smith¹⁾

Caspar

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9~12 mm

1~2 mm

, Bohlman^{2,3)}

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2~3

가

2

4,5,6)

(isometric exercise)

3. 가

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7)

(Fig. 1).

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Brantigan⁸⁾

(bone bridge)

가가

1.

1998 1 2003 8

Smith-Robinson

65 1 가 가

41

가 26 , 가 15

43.5 (25~72) , 2.1 (1.2~5.6)

15

26

2.

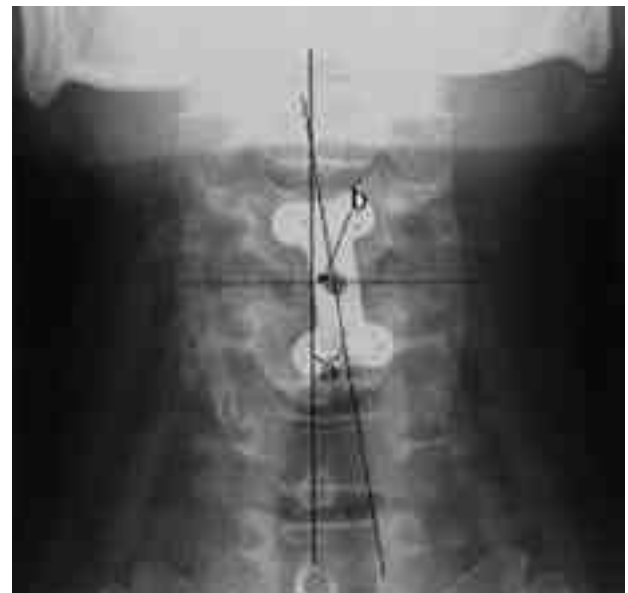


Fig 1. The measurement of angulation and translation of the anterior plates. (a: angulation, b: translation)

가 5 , 2.
3 mm Robinson Robinson
(Excellent), 가 30 , (Fair)가 6 ,
(Good), (Good) 3 , (Poor) 2 .
가 (p>0.05,
(Poor) chi-square Table 2-1, 2).
test(SPSS 10.0 version) p 0.05

1955 Robin-
son Smith
Robinson Smith
가
6.2 (0~17.3) , 3.21 mm(0~11.2
mm) . Bell Bailey⁹⁾
21% 가, 38%
12.8 (6~22) . 92%
1964 Bohler Gaudermak⁴⁾
(p>0.05, Table 1-1, 2). AO
93% 99%
^{3,4)} Wang ¹⁰⁾

Table 1-2. The relationship of the translation of plates and fusion period.

	mean fusion period(weeks)
0-3 mm	12.8
3-6 mm	9.3
6-9 mm	14.1
9-12 mm	11.5

(p>0.05)

Table 1-1. The relationship of the angulation of plates and fusion period.

	mean fusion period(weeks)
0-5 deg	13.2
5-10 deg	12.8
10-15 deg	12.6
15-20 deg	13.0

(p>0.05)

Table 2-1. The relationship of the angulation of plates and clinical results.

	Excellent	Good	Poor
0-5 deg	12	2	2
5-10 deg	5	3	1
10-15 deg	8	1	0
15-20 deg	5	0	2

(p>0.05)

Table 2-2. The relationship of the translation of plates and clinical results.

	Excellent	Good	Fair
0-3 mm	7	1	1
3-6 mm	10	2	2
6-9 mm	7	2	0
9-12 mm	6	1	2

(p>0.05)

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 son 65 1 가 가 41
 . 가 26 , 가 15 43.5(25~72) , 2.1(1.2~5.6)
 15 26 .
 가 . chi-square test
 : , 2 (hoarsness), 1 (torticollis)
 6.2 (0~17.3) , 3.21 mm(0~11.2 mm)
 .(p>0.05)
 (p>0.05).

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