Manuscript Title: Partial uncinatectomy combined with anterior cervical discectomy and fusion for the treatment of one-level cervical radiculopathy: analysis of clinical efficacy and sagittal alignment

Abstract

Objective: The clinical efficacy and sagittal alignment of partial uncinatectomy (UT) during anterior cervical discectomy and fusion (ACDF) have not been fully elucidated.

Methods: A total of 87 patients who had undergone single level ACDF using a zero-profile device from July 2014 to December 2018 were included. Based on whether the foraminal part of the uncovertebral joint was resected or preserved, the patients were divided into the ACDF with UT group (n = 37) and the ACDF without UT group (n = 50). Perioperative data, radiographic parameters, clinical outcomes, and complications were compared between the two groups.

Results: The average preoperative VAS arm score was 5.89 ± 1.00 in the ACDF with UT group and 5.18 ± 1.21 in the ACDF without UT group ($p = 0.038$). However, the average VAS arm score was 4.22 ± 0.64, 4.06 ± 1.13 and 1.68 ± 0.71, 1.60 ± 0.70 at 1 week post operation and at final follow up, respectively, ($p > 0.05$). We also found that the C2-7 SVA and St-SVA at the last follow-up and their change in the ACDF with UT group were significantly higher than ACDF without UT group ($p < 0.05$). No marked differences in the other cervical sagittal parameters, fusion rate or complications, including dysphagia, ASD, and subsidence, were observed.

Conclusion: Our result indicates that ACDF using a zero-p implant with or without partial UT both provide satisfactory clinical efficacy and acceptable safety. However, additional partial UT may has a negative effect on cervical sagittal alignment.

Table 1 Radiographic assessments of patients in three groups (mean±SD)

Group	ACDF with UT	ACDF without UT	p
C2-7A (°)			
preoperative	14.23 ± 5.06	12.93 ± 7.00	0.345
1 week	13.26 ± 8.13	11.96 ± 6.46	0.176
Last follow-up	12.78 ± 7.49	11.25 ± 6.62	0.317
dC2-7A (°)	-1.45 ± 8.45	-1.69 ± 7.72	0.874
FSUA (°)			
preoperative	3.24±1.93	3.37 ± 1.89	0.875
1 week	3.12 ± 1.88	3.21 ± 1.87	0.826
Last follow-up	3.05 ± 1.80	3.09 ± 1.93	0.914
dFSUA (°)	-0.25 ± 0.58	-0.28 ± 0.59	0.862
C2-7 SVA (mm)			
preoperative	18.67 ± 6.08	19.84 ± 7.00	0.417
1 week	18.32 ± 6.03	18.17 ± 6.99	0.915
Last follow-up	18.62 ± 6.33	15.75 ± 6.02	**0.034** *
dC2-7 SVA (mm)	-0.05 ± 6.22	-4.09 ± 9.21	**0.023** *
St-SVA (mm)			
preoperative	28.09 ± 5.83	29.86 ± 6.69	0.417
1 week	24.80 ± 6.36	25.17 ± 5.39	0.052
Last follow-up	26.25 ± 10.64	22.15 ± 8.44	**0.033** *
dSt-SVA (mm)	-2.49± 12.51	-7.70 ± 8.44	**0.019** *
T1 slope (°)			
preoperative	27.92±6.66	26.29±6.30	0.229
1 week	26.55±5.19	27.00±5.71	0.709
Last follow-up	26.79±6.20	27.19±7.07	0.784
dT1 slope(°)	-1.18 ± 5.69	0.91 ± 7.23	0.149

SD, standard deviation; C2-7A, C2-7 angle; FSUA, functional spinal unit angle; C2-7 SVA, C2-7 sagittal vertical axis; St-SVA, sellar turcica–sagittal vertical axis;

d: the difference of parameters at last follow-up and preoperative;

* Indicates statistically significant differences ($p<0.05$).

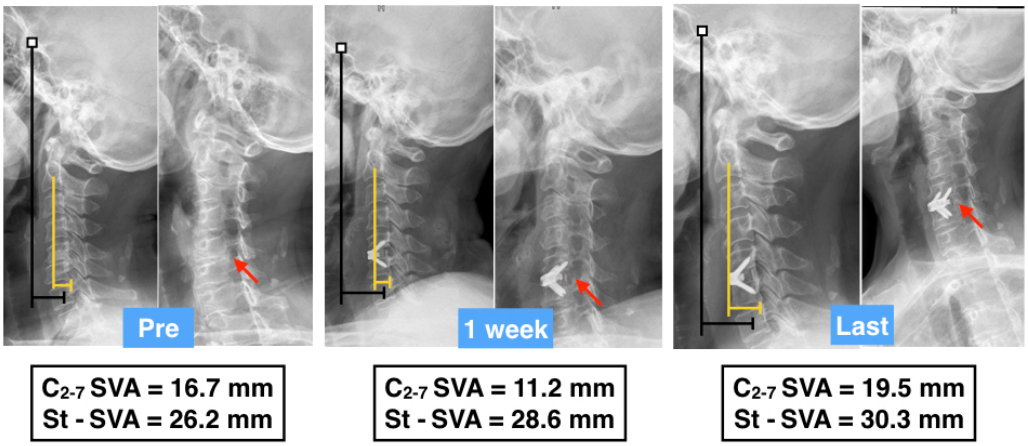

Fig.1 A 58-year-old woman was diagnosed with cervical radiculopathy combined with foraminal stenosis caused by uncovertebral joint hyperplastic osteophytes, which can be seen on preoperative right oblique imaging (red arrow). The patient underwent ACDF with partial uncinatectomy. The improvement of C2-7 SVA and St-SVA was not obvious after the surgery