

## Prevertebral Soft Tissue Swelling After Anterior Cervical Discectomy and Fusion

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### – Abstract –

**Study Design:** Prospective study of 87 patients

**Objectives:** To identify the natural course of the prevertebral soft tissue swelling after a one- or two- level anterior cervical discectomy and fusion (ACDF) and to help prevent potentially lethal airway complications after an ACDF.

Summary of Literature Review: Airway complication after anterior cervical surgery is rare but potentially lethal.

**Materials and Methods:** Eighty- seven patients who underwent a one- or two- level ACDF with a plate and screws were examined. Cervical spine lateral radiography was taken preoperatively, on the immediate postoperative day, 1st, 2nd, 3rd, 4th and 5th day after surgery. Prevertebral soft tissue was measured from C2 to C6 on the cervical spine lateral radiography.

**Results:** Prevertebral soft tissue swelling occurred postoperatively and increased markedly on the second day after surgery. The peak prevertebral soft tissue swelling was observed on the second and third day after surgery. The prevertebral soft tissue swelling was decreased gradually from the 4th day after surgery. Prominent swelling of the prevertebral soft tissue was found at the 2nd, 3rd and 4th cervical spine. There were no significant differences in the prevertebral soft tissue swelling between the one- level and two- level ACDF group. Only one patient required reintubation (1.1%)

**Conclusions:** The peak prevertebral soft tissue swelling was observed on the second and third day after surgery. Therefore, maintaining intubation for 3 or 4 days after surgery would be helpful in high- risk patients.

**Key Words:** ACDF, Cervical spine, Prevertebral soft tissue swelling

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**Table 1.** Serial measurements of prevertebral soft tissue

Time / Level	Preop (mm)	Postop	Day 1	Day 2	Day 3	Day 4	Day 5
C2	3.5	5.1	6.9	10.2	9.7	7.2	5.9
C3	3.7	6.1	8.9	12.7	12.9	10.4	9.0
C4	6.1	9.7	12.0	14.5	14.7	13.0	12.0
C5	14.4	16.2	17.2	17.6	18.0	16.6	16.8
C6	15.5	17.2	17.8	17.3	18.0	18.0	18.0

**Table 2.** Comparison of prevertebral soft tissue between proximal to C5 surgery group and distal to C5 surgery group

Time / Level	Preop (mm)		Postop		Day 1		Day 2		Day 3		Day 4		Day 5	
	Prox*	Dist†	Prox	Dist	Prox	Dist	Prox	Dist	Prox	Dist	Prox	Dist	Prox	Dist
C2	3.6	3.5	6.4	4.5	8.4	5.0	13.1	8.5	11.2	8.7	9.2	6.1	8.1	4.9
C3	3.9	3.6	7.3	5.6	11.7	6.8	15.5	11.0	14.1	12.0	10.8	10.1	11.1	7.9
C4	5.9	6.2	9.8	9.7	13.0	11.1	16.6	13.2	15.1	14.5	13.5	12.6	13.9	11.1
C5	13.7	14.8	15.6	16.4	17.6	16.9	17.9	17.4	17.7	18.2	16.4	16.8	17.8	16.3
C6	15.6	15.3	17.2	17.1	18.5	17.6	17.7	17.0	18.0	18.1	17.8	18.1	18.9	17.6

\* Prox = proximal to C5 surgery group

† Dist = distal to C5 surgery group



**Fig. 2.** ACDF C4-5 was performed due to disc herniation at C4-5 in a 42-year-old male patient. The 2nd day after the surgery, he complained severe dyspnea. Cervical spine lateral radiography showed severe prevertebral soft tissue swelling.

6 15.5 mm  
 17.2 mm (P=0.000) 가  
 1 17.8 mm (P=0.339), 2 17.3 mm (P=0.459), 3 18.0 mm (P=0.608), 4  
 18.0 mm (P=0.756), 5 18.0 mm (P=0.577)  
 (Table 1).  
 Pearson 0.984 0.992  
 0.964 0.932  
 2 3 가  
 4 2, 3, 4  
 5 6  
 . 1 2  
 3 14.7 mm (P=0.936)  
 4 13.0 mm (P=0.037), (P>0.05).  
 5 12.0 mm (P=0.002)  
 5 14.4 mm 5 5  
 16.2 mm (P=0.000) 가  
 1 17.2 mm (P=0.161), 2 17.6 mm (P=0.332), 3 18.0 mm (P=0.608), 4 (P<0.005), 3  
 16.6 mm (P=0.056), 5 16.8 mm (P=0.077) 가 (Table 2).

87	1	(1.1%)	1	2	87
(Fig. 2).					
	가		Emery <sup>1)</sup>	가	
			DeBehnke Havel <sup>5)</sup>		
	가	가		가	
				1, 2, 3, 4, 5	
Emery <sup>1)</sup>		7	가	가	가
			가	2	3
Fujiwara <sup>2)</sup>	4	171			
	3	3	2	3	
Epstein <sup>3)</sup>			Uppal	Akmakjian <sup>6)</sup>	1999
					(outpatient cervical fusions)
	10				23
					가
	311		2, 3	가	2, 3
	1.9%	6.1%			
	1				2, 3, 4, 6
		5			5
	, 300 ml				3
			Fujiwara <sup>2)</sup>		
			1	2	
	1	2		가	1
					2

가 .3  
 가 Sagi<sup>4)</sup> 4  
 Epstein<sup>3)</sup> 3  
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 4 가 3  
 Fujiwara <sup>2)</sup>  
 2, 3 가 2, 3,  
 4 가 .  
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