

Elucidating the Role of PVST Swelling in the Incidence of Postoperative Complications: A Multifactorial Risk Analysis in ACDF for Traumatic Cervical Spine Injuries

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Background: ACDF is a primary surgical intervention for cervical spine pathology. However, ACDF can lead to complications such as dysphagia and respiratory compromise. There is a lack of focused research on patients undergoing ACDF following trauma, particularly in the context of predictive risk factors and outcomes.

Question: This study aims to determine whether the risk factors for postop. cx., specifically dysphagia & dyspnea, in patients undergoing ACDF for cervical spine trauma.

Design & Methods: A retrospective analysis was conducted on 110 patients who underwent ACDF for cervical spine trauma from May 2014 to Feb. 2023. The study correlated postop. cx. with various factors, including age, steroid use, surgical location, and PVST swelling, measured at the C2-C6 levels.

Result: Older patients and those with significant preop. PVST were more likely to experience dyspnea. Dysphagia was more prevalent in patients with upper cervical surgical locations(above C4) and severe postop. PVST. The study found that preop. PVST was significantly wider in patients with dyspnea, whereas both postop. PVST and preop. to postop. PVST change were significant in the dysphagia group. Interestingly, the use of steroids did not significantly influence the occurrence of complications. ROC analysis identified specific cutoff points for PVST measurements, enhancing the predictive accuracy for both complications.

Discussion: The study highlights the importance of age, surgical location, and PVST swelling as significant risk factors for postoperative complications in trauma patients undergoing ACDF. The differential impact of PVST swelling at various stages underscores the need for both preoperative and postoperative assessments in predicting outcomes. These findings provide a nuanced understanding of complication risks and advocate for tailored perioperative management strategies in this patient cohort.

Fig. 1

Summary

Table 7. Comparison of Dyspnea & Dysphagia

Risk factors (except PVST)	Dyspnea		Dysphagia	
	Old age		Upper cervical level	
PVST swelling	Preoperative	Postoperative	Delta	
Cutoff value (mm)	12.4	15.6	14.9	10.6
Date of occurrence	Within first 3 days			

- If the PVST thickness value is more than each value within 3 days after surgery, be aware of the possibility of complications.



Fig. 2

Cut off value ; Dyspnea

Table 3-1. Respiratory compromise Area under the Curve

	Area	Standard Error	Approximate Significance	Approximate 95% Confidence Interval	
				Lower Bound	Upper Bound
Preoperative PVST	0.668	0.083	0.040	0.506	0.830
Postoperative PVST	0.759	0.061	0.002	0.639	0.878
Delta PVST	0.534	0.083	0.675	0.372	0.696

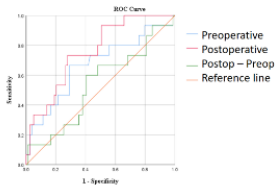


Fig. 3

Cut off value ; Dysphagia

Table 4-1. Dysphagia Area under the Curve

	Area	Standard Error	Approximate Significance	Approximate 95% Confidence Interval	
				Lower Bound	Upper Bound
Preoperative PVST	0.444	0.084	0.492	0.280	0.608
Postoperative PVST	0.569	0.072	0.038	0.528	0.810
Delta PVST	0.697	0.080	0.016	0.539	0.855

