The Effects of Occipito-Cervico-Thoracic Fusion on Postoperative Dysphagia Severity in Adult Patients

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Introduction

Occipito-cervical (OC) and occipito-cervico-thoracic (OCT) fusions are known to cause postoperative dysphagia.

Various cranial-cervical measurements have been used to investigate their effects on the presence and severity of postoperative dysphagia; however, the exact mechanisms and anatomical impact remain unclear.

Methods

Retrospective chart review on adult patients who underwent OC/OCT fusion from 2000 to 2022 and reported postoperative dysphagia

Pre and postoperative data on vertebral level fused was collected and O-C2 angle, PIA, and PAS diameter were measured

- Predictors: Degree of deviation from neutral **O-C2** angle, pharyngeal inlet angle (**PIA**), pharyngeal anterior-posterior space (**PAS**) diameter, and **vertebral levels fused**
- Outcome: Subjective reports of postoperative dysphagia and objective reports of swallowing dysfunction

Dysphagia severity was recorded from postoperative Modified Barium Swallow Studies (MBSS)

Statistical analyses were performed in R

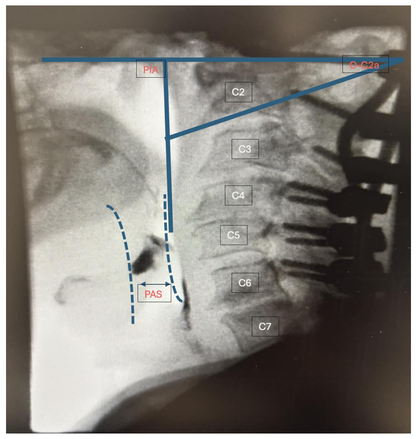

Figure 1

Results

Table 1

	Overall (N=25)
Pre-Op O-C2 (°)	
Mean (SD)	22.4 (5.02)
Median [Min, Max]	25.0 [7.00, 29.0]
Post-Op O-C2 (°)	
Mean (SD)	20.0 (4.66)
Median [Min, Max]	20.0 [14.0, 34.0]
Pre-Op PAS (mm)	
Mean (SD)	9.36 (1.01)
Median [Min, Max]	9.50 [7.20, 11.3]
Post-Op PAS (mm)	
Mean (SD)	9.47 (1.42)
Median [Min, Max]	9.50 [7.50, 12.9]
Pre-Op PIA (°)	
Mean (SD)	103 (9.46)
Median [Min, Max]	104 [82.0, 120]
Post-Op PIA (°)	
Mean (SD)	103 (23.0)
Median [Min, Max]	98.0 [85.0, 205]
Levels Fused Collapsed	
O-C2 to O-C4	13 (52.0%)
O-C5 to O-T1	12 (48.0%)
Swallowing Dysfunction	
Missing/Not Reported	14 (56.0%)
Mild	7 (28.0%)
Moderate	2 (8.0%)
Severe	2 (8.0%)
Age	
Mean (SD)	56.0 (19.2)
Median [Min, Max]	57.0 [23.0, 84.0]

Table 2

Variable	Coefficient	Standard Error	Z-value	P-value
Change in O-C2 Angle	-0.15°	0.16	-0.94	0.346
Change in PAS Diameter	-0.60mm	0.63	-0.96	0.338
Change in PIA Angle	0.22°	0.11	2.07	0.038

Discussion

When compared to fusion levels O-C2 to O-C4 (n=13), patients with fusion levels O-C5 or greater (n=12) had progressively higher severity of dysphagia ($p < 0.001$)

An increase in the PIA was associated with increasing severity of swallow dysfunction

PAS diameter, O-C2 angle and age were not significantly associated with severity of swallow dysfunction

Limitations

- Small sample size
- Not all patients received MBSS (pre and/or postoperatively)

Future Directions

- Prospective cohort to collect pre and postoperative PROMs and MBSS
- Collaborate with School of Health and Rehabilitation Sciences to optimize measurements that may predict optimal angle for occipito-cervical fusion to reduce postoperative dysphagia

Conclusions

The notable incidence of postoperative dysphagia following OC/OCT fusions warrants close monitoring and routine assessment. PIA can potentially be used to predict dysphagia occurrence and severity, which may be useful in preoperative planning and prevention of postoperative dysphagia.

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