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Cervical Rib Resection Strategies and Outcomes in Neurogenic Thoracic Outlet Decompression

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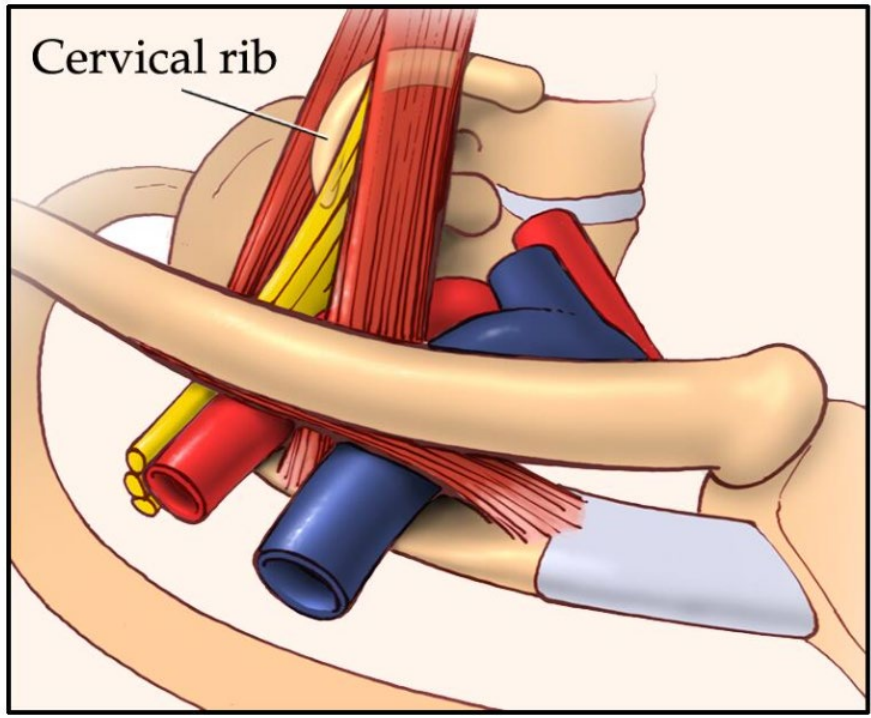
DISCLOSURES

- None

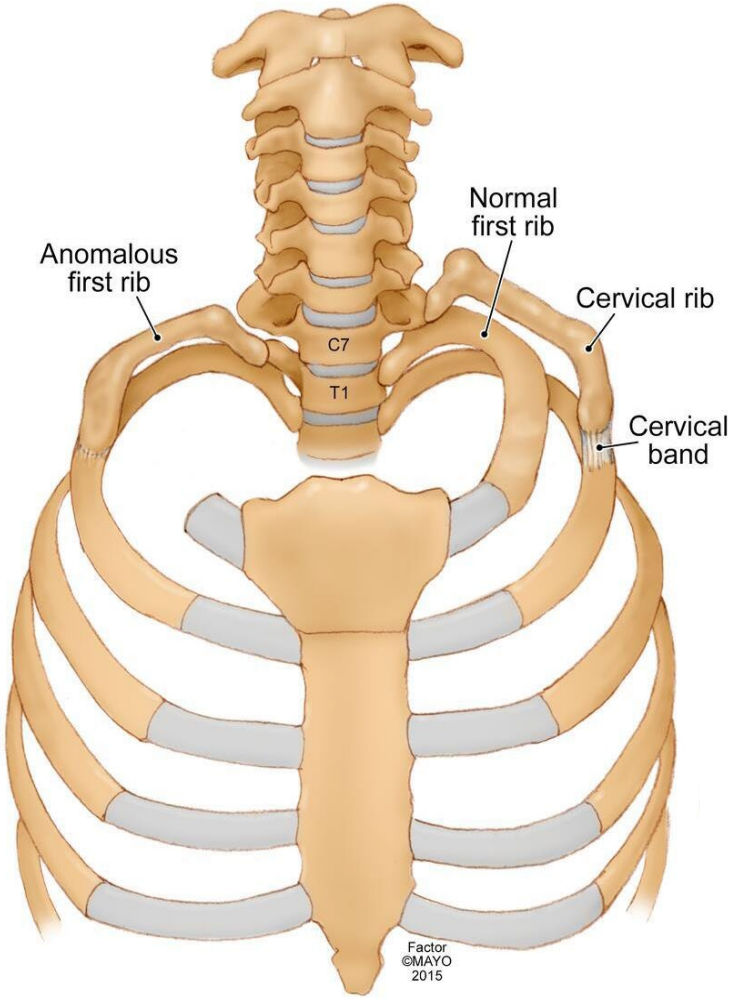
BACKGROUND

- Thoracic outlet syndrome (TOS) results from compression of neurovascular structures at the thoracic outlet.
- Frequent causes of TOS:
  1. Cervical rib (CR).
  2. Clavicular fracture.
  3. Fibrocartilaginous band.
  4. Over head repetitive motions.
- Neurogenic TOS (nTOS) represents >95% of all TOS cases.



BACKGROUND

- CR account for approximately 69% of thoracic outlet syndrome (TOS) cases.
- CRs have been reported in up to 20-45% of nTOS cases.
- However, the impact of CR resection as part of the thoracic outlet decompression (TOD) and its outcomes remains debated.



METHODS

- A retrospective single-institution review in patients who underwent TOD with CR.
- Time period: 1987–2024.
- Inclusion: nTOS with CR undergoing TOD.
- Patients were categorized into two groups according to the surgical strategy:
  1. CR resection alone.
  2. CR resection + first rib (FR) resection.

PATIENT DEMOGRAPHICS

106

Total Patients

nTOS with CRs undergoing TOD (1987–2024)

25

CR Alone

23.6% of cohort; isolated CR resection

81

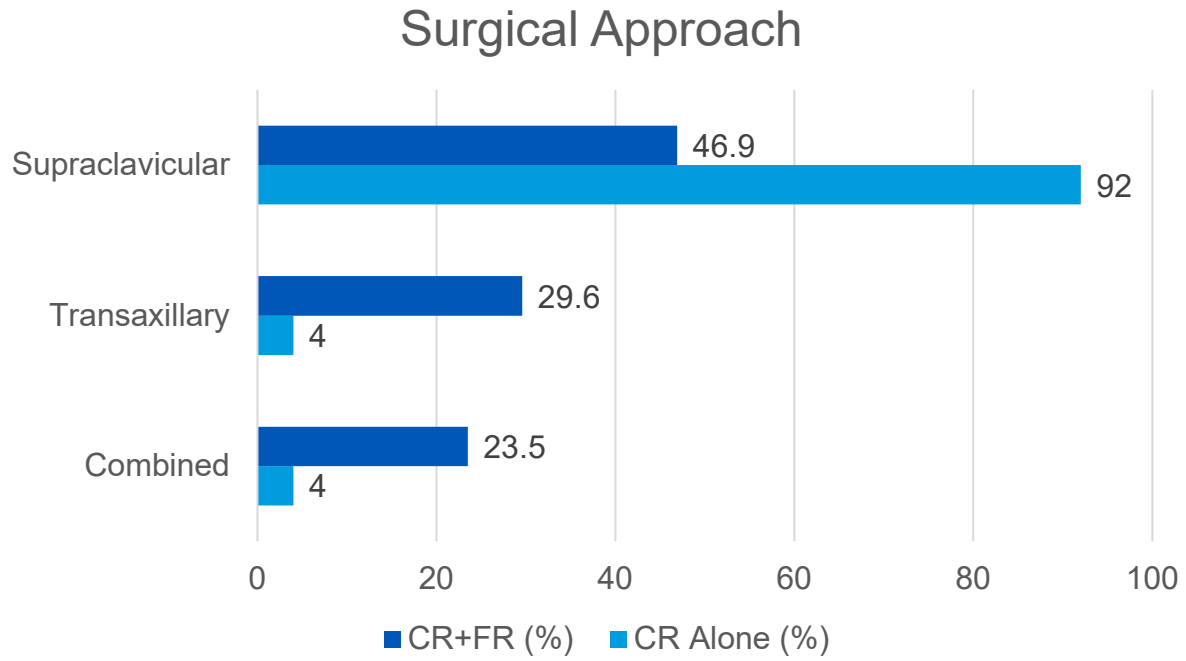
CR+FR

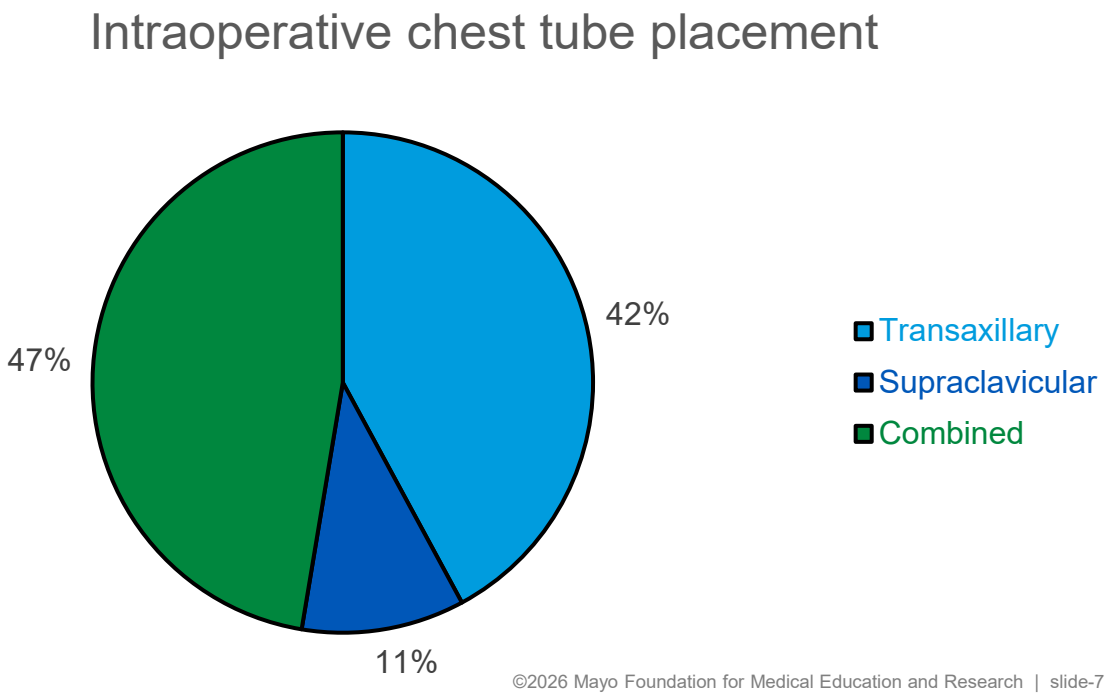
76.4% of cohort; combined CR + FR resection

Baseline demographics including age, sex, and comorbidities were **similar between groups**.

SURGICAL APPROACH

	CR (N=25)	CR + FR (N=81)	p-value
Approach			
• Transaxillary	1 (4.0%)	24 (29.6%)	**0.008**
• Supraclavicular	23 (92.0%)	38 (46.9%)	**< 0.001**
• Combined	1 (4.0%)	19 (23.5%)	**0.03**
ASA score			
• 1	1 (16.7%)	11 (27.5%)	
• 2	5 (83.3%)	24 (60.0%)	
• 3	0 (0.0%)	5 (12.5%)	
Pectoralis minor release	0 (0.0%)	1 (1.2%)	0.577
Intraoperative chest tube placement	0 (0.0%)	19 (23.5%)	**0.008**
LOS			0.137
• Mean (SD)	1.6 (0.8)	2.2 (1.4)	
• Median (Q1, Q3)	1.5 (1.0, 2.0)	2.0 (1.0, 2.8)	

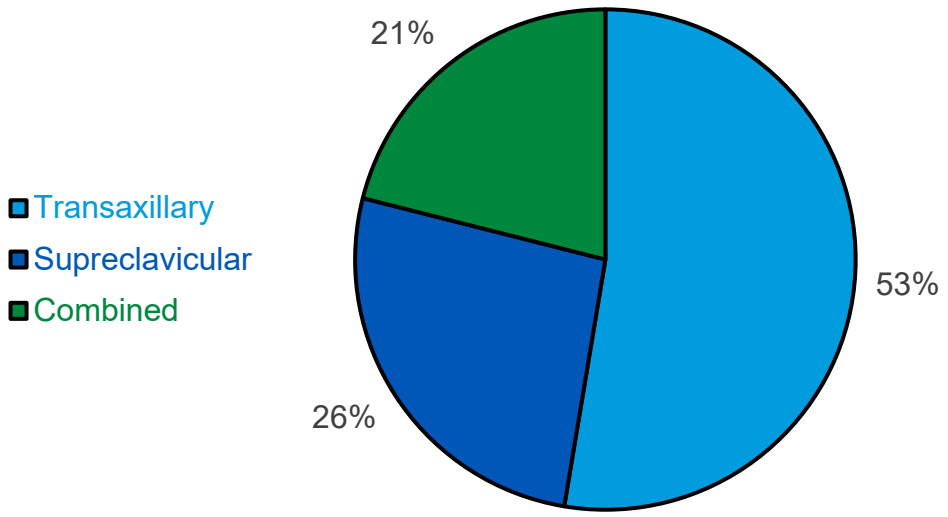




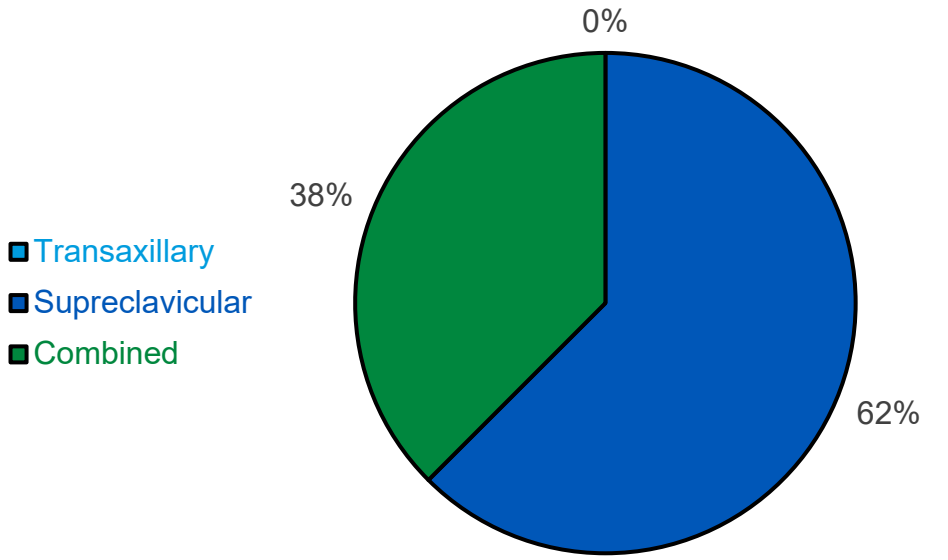
POST-OPERATIVE COMPLICATION

	CR (N=25)	CR + FR (N=81)	p-value
Pneumothorax	0 (0.0%)	19 (23.5%)	**0.008**
Hemothorax	0 (0.0%)	1 (1.2%)	0.577
Peripheral nerve injury	0 (0.0%)	2 (2.5%)	0.428
DVT/PE Complex	0 (0.0%)	2 (2.5%)	0.428
Pneumonia	1 (4.0%)	2 (2.5%)	0.687
Superficial SSI	0 (0.0%)	1 (1.2%)	0.577
Pleural effusion	0 (0.0%)	16 (19.8%)	**0.016**
Chest wall hematoma	1 (4.0%)	2 (2.5%)	0.687

Pneumothorax



Pleural effusion



OUTCOMES

	CR (N=25)	CR + FR (N=81)	p-value
Symptoms/Sign recurrence	3 (12.0%)	14 (17.7%)	0.5
Re-Do Surgery	1 (4.0%)	3 (3.7%)	0.946
Reinterventions	0 (0.0%)	6 (7.4%)	0.161
Outcomes at follow-up			
• Symptom improvement	22 (88.0%)	72 (91.1%)	0.643
• No symptom improvement	3 (12.0%)	7 (8.9%)	0.643
Follow-up time			0.333
• Mean (SD)	23.2 (27.2)	19.8 (37.1)	
• Median (Q1, Q3)	10.0 (2.0, 43.0)	5.0 (1.0, 16.0)	

LIMITATIONS

- Retrospective, single-institution design.
- Unequal group sizes.
- Temporal factor with possible practice variation.

CONCLUSION

- CR+FR resection is associated with significantly higher rates of pleural complications.
- CR resection alone and CR+FR resection achieve similarly high rates of long-term symptom relief in patients with nTOS.
- No additional long-term symptomatic benefit was observed with routine FR resection.
- Therefore, CR resection alone may be sufficient in carefully selected patients.

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THANK YOU

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