

# Patient Characteristics of those Presenting for Thoracic Outlet Syndrome Surgical Treatment

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## Background

The operative approach for thoracic outlet syndrome (TOS) varies in the United States. Although many other clinical syndromes and disorders are associated with predictable risk factors and typical features, common associations with thoracic outlet syndrome have yet to be described. We sought to identify patient characteristics presenting for different TOS surgical interventions.

## Research Objective

To determine the characteristics of patients presenting for TOS repair and differences in characteristics with respect to surgical approach.

## Methods

Patients treated for TOS between 2016 – 2018 were identified from the American College of Surgeons National Surgical Quality Improvement Program (NSQIP). For statistical analysis, patient cohorts were stratified by type of operative intervention (transthoracic rib resection vs. supraclavicular scalene division with or without rib resection). We excluded cases from review if there were less than 10 identified cases for a given primary CPT9 code.

## Results

- 1023 patients were identified in this cohort. The average age of patients was 36.4. 61.9% of patients were female and 88% were White
- Patients undergoing tenotomy were generally the oldest (40.1 years) while those undergoing excision of a cervical rib with a sympathectomy were much younger (32.6 years).

Table 1. Patient Characteristics and Disposition

Parameter	Transthoracic Rib Resection	Supraclavicular Scalene Division	P-value
Age (years)	36.2 ± 12.9	36.3 ± 11.7	0.9094
Race			0.164
• White	441 (95.0%)	237 (91.1%)	-
• Black	19 (4.09%)	17 (6.5%)	-
• Other	4 (0.86%)	6 (2.31%)	-
BMI	27.2 ± 5.79	27.5 ± 7.13	0.579
Gender	294 (58.7%)	188 (67.1%)	<b>0.020</b>
Inpatient Status	381 (76.0%)	200 (71.4%)	0.156
ASA Class			<b>0.022</b>
• Class I	95 (18.9%)	34 (12.1%)	-
• Class II	311 (62.1%)	203 (72.5%)	-
• Class III	87 (17.4%)	39 (13.9%)	-
• Class IV	8 (1.59%)	3 (1.07%)	-

*\*Values of categorical variables were recorded as mean (%), and values of quantitative variables were recorded as mean ± st. dev. P-values <0.05 were deemed significant*

## Results (cont.)

- When surgical operations were grouped into transthoracic rib resection vs. supraclavicular scalene division, no differences existed in age (36.2 ± 12.9 vs 36.3 ± 7.2 years), BMI (27.2 ± 5.8 vs 27.5 ± 7.1) or other demographics.
- Patients undergoing rib resection were more likely to have an ASA class of I or III, whereas patients undergoing scalene division were more likely to exhibit an ASA class of II (p = 0.022).
- The most common co-morbidities among patients in this cohort were smoking history (15.7%), medically treated hypertension (12.3%), and bleeding history (8.2%)

## Conclusions

- White, female patients who were overweight represented the majority of patients presenting for surgically treated TOS.
- Female patients were more likely to undergo a supraclavicular scalene division. Otherwise, no significant differences existed in patient characteristics.
- Although significant differences exist in individual patient ASA classes between operations, overall relationship appears insignificant due to the given distribution.
- Because of similar patient demographic presentations, along with similar complication rates, patient characteristics may not be an important factor in guiding surgical approach.
- Approach to TOS surgery should be provider-dependent based on training, expertise, and the individual patient's disease course.

## Limitations

- NSQIP data is limited to hospitals and centers that provide data and participate in the program but may not be representative of TOS presentations nationally.
- Complication data was only reported/analyzed up to 30-days post-operatively and conclusions cannot be made regarding subacute and chronic complications/outcomes.
- Relationships between demographics and conservative non-surgical treatment was not reviewed.

## Acknowledgements

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