New study finds TOS complications are rare


CHICAGO, Illinois, September 2017 – A national study has confirmed the safety of thoracic outlet decompression surgery, validating the findings of previous single-center experiences.

Thoracic outlet syndrome (TOS) is relatively rare but may affect those who use a lot of repetitive upper arm movements, such as athletes. It commonly becomes news when a professional athlete is sidelined for TOS surgery to repair nerve compression.

The surprising level of safety was reported in the September edition of the Journal of Vascular Surgery. University of Wisconsin vascular surgeon Dr. Kyla Bennett and researchers reviewed data of 1,431 TOS patients over a nine-year period.

The syndrome occurs in a very small area above the clavicle, called the supraclavicular fossa. This is a “high rent” district; within just a two- or three-centimeter region lie the nerves to the entire arm, scapula and hemi-diaphragm.

In a normal human body, immediately adjacent to the brachial plexus (a network of nerves that sends signals from the spine to the shoulder) is the somewhat fragile subclavian artery, and hidden between the clavicle and first rib is the large subclavian vein with its multiple branches.

Those with thoracic outlet syndrome might have additional anatomic variances, including an extra rib formation called a “cervical rib,” bulky first ribs and multiple muscular and tendinous bands that make decompressive surgery of this region tricky business.

Indicators for TOS decompression surgery include neurogenic and vascular symptoms due to upper extremity deep vein thrombosis, subclavian aneurysm, thrombosis and embolization.

These complex surgeries, often performed by vascular surgeons who specialize in this area, can put at risk the many adjacent structures critical to normal arm function. Previous published case series, have found thoracic outlet surgery to be both safe and effective, but those reports were based largely single-center experiences with limited generalizability to “real world” experience.

Utilizing the American College of Surgeons’ National Surgical Quality Improvement Program (NSQIP) database, Dr. Bennett’s team looked at 1,431 first and/or cervical rib resections and found that the incidence of nerve injury and significant bleeding—two potentially serious complications of thoracic outlet surgery—to be remarkably low, with just 0.3
percent resulting in nerve injuries and 1.4 percent requiring transfusion.

They also reported the composite endpoint of 30-day readmission and/or reoperation for this surgery to be 8.6%. Subsequent multivariate analysis risk factors for readmission/reoperation included:

- higher ASA score (3 or greater)
- vascular indications for decompression
- lengthy initial surgery

Ninety percent of thoracic outlet surgery reported nationally was performed by vascular surgeons. Consistent with what is known about indications for thoracic outlet decompression, they documented the indications as:

- neurogenic 83%
- venous 12%
- arterial 3%
- undetermined 2%

“This study provides a unique perspective on the current state of TOS surgery in the U.S. nationally,” said lead author Dr. Elena Rinehardt, “and confirms the findings of previous single-center and administrative database studies with respect to the very low rate of nerve injury.”

While this NSQIP study by its nature cannot report symptomatic outcomes, the low rate of complications suggests a potentially high therapeutic index for those who undergo thoracic outlet decompression.

The thoracic outlet is a complicated region of the body. Fortunately those who have operated upon it have done so safely.

To download the complete article (available FREE from August 22-October 31, 2017), click: VSweb.org/JVS-TOS.

For information your patients may be interested in, click: https://vascular.org/patient-resources/vascular-conditions/thoracic-outlet-syndrome.

###

**Article Date:** Monday, August 21, 2017  
**Author:** Dr. Paul DiMuzio, JVS  
**Tags:** Research & Quality  
**Article Type:** Press Release