# Robotic Approach To Thoracic Outlet Decompression: How To Do It: Limitations And Contraindications

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## Disclosures

No relevant disclosures

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## History of Robotic TOS Decompression

- A standard part of many thoracic surgery practices for >10 years
  - However, many thoracic surgeons have far less understanding of the pathophysiology and patient management but are facile with robotic surgery
- Clearly demonstrated to be safe and effective in large case series
- Appropriate for many but not all types of TOS
  - At NYU, we have done ~40 cases since starting this program in early 2023

## What We Don't Have Time to Discuss

- Logistics of getting robotics privileges as a vascular surgeon
- Training pathway considerations
- Turf wars/politics of robot utilization

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Thoracic: Thoracic Outlet Syndrome

### Safety of robotic first rib resection for thoracic outlet syndrome

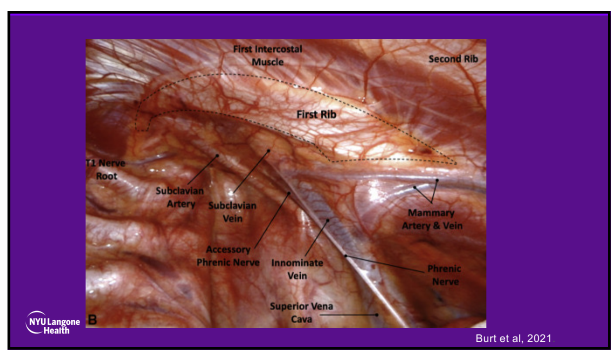
*Accepted for the 100th Annual Meeting of The American Association for Thoracic Surgery.*

Bryan M. Burt MD [a], Nihanth Palivela BS [a], Davut Cekmecelioglu MD [a], Paul Paily MD [c], Bijan Najafi PhD [b], Hyun-Sung Lee MD, PhD [a], Miguel Montero MD [b]

- Compared robotic approach (66 patients) to supraclavicular approach (50 patients) for vTOS and nTOS
- Lower pain scales and use of morphine equivalents with R-FRR
- R-FRR associated with less frequent total complications
  - Most would argue that in experienced hands, any approach is safe with low overall complications

## Technical Details:

- Why bother?
  - Much broader field of view
  - Larger portion of the rib can be resected en bloc
  - Lower post-operative pain scales
  - Incisions are small and hidden from view (8mm x 3, 10mm x 1)
  - Relatively fast with an experienced robotic team
  - Surgeon ergonomics
  - It's COOL




Burt et al, 2021

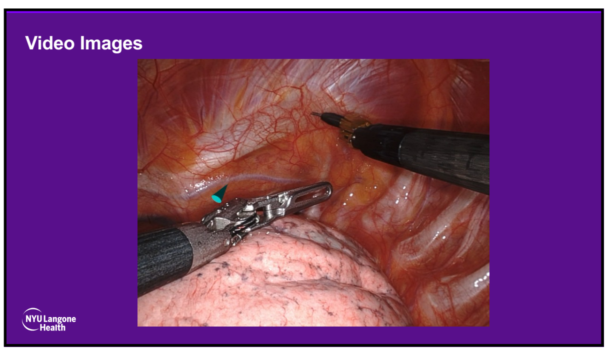
## Technical Details:

- General anesthesia with double lumen endotracheal tube (single lung ventilation)
- Lateral decubitus position
- 4 ports: 3 robotic arms and an assist port with AirSeal for smoke evacuation
  - Generally 7/8th intercostal space
    - Just inferior to the tip of the scapula
    - Anterior to the anterior axillary line
    - Mid-axillary line

## Technical Details:

- Intercostal muscle is divided off the rib to define the edges of the rib
- The costal cartilage medially can be divided using electrocautery
  - Our preference is to use a Prograsp (left hand) and Spatula (right hand)
- Determine the posterior aspect of transection
  - Remove the posterior (scapular) port, and divide the rib by hand with a 6mm kerrison
    - Greater control and precision than the available drills
    - Long drill bits often on backorder
- Can easily perform partial anterior and middle scalenectomies, venolysis, neurolysis etc.

## Video Images



## Video Images

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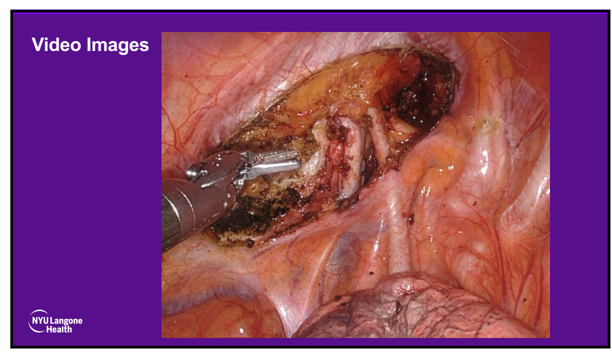

## Contraindications

- Patients who cannot tolerate general anesthesia and single lung ventilation:
  - Severe pulmonary hypertension, dense pleural adhesions, recent MI or unstable coronary disease
- Arterial TOS requiring vascular reconstruction
  - Generally requires an open supraclavicular approach with resection of aneurysms/vascular reconstruction
- Pectoralis minor syndrome release cannot easily be performed using this approach

## References


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# Thank you!

If you have interest in this topic, feel free to contact me at
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