

MULTI-DERMATOMAL REGIONAL BLOCKADE FOR PERIOPERATIVE ANALGESIA FOR FIRST RIB RESECTION

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INTRODUCTION

- ❖ Thoracic outlet syndrome – syndrome of neurovascular compression at the thoracic outlet.
- ❖ Affects 1-3 per 100,000 individuals (1).
- ❖ Patients with visualized anatomical causes are often treated surgically with first rib resection (FRR).
- ❖ Regional anesthesia (RA) and pain catheters have been shown to reduce pain scores compared to general anesthesia (GA) alone for FRR (2).
- ❖ Use of RA for surgical management of TOS is complicated by use of several incisions in a small area, which is overlapped by several different dermatomes (Image 1).

CASE PRESENTATION

- ❖ Patient: 22 y/o male with no significant past medical history
- ❖ Hospital Day 1: Initial ED presentation for acute onset RUE discoloration and swelling, diaphoresis, and lightheadedness.
 - Occlusive thrombi within right subclavian, axillary, and basilic veins, and multiple pulmonary emboli
 - Venogram with stenosis of right subclavian vein at the level of anteriorly crossing first rib and confirmed diagnosis of TOS
- ❖ Hospital Day 6: Day of surgery
 - Planned incisions: a transverse infraclavicular incision and a longitudinal incision along the superolateral border of the pectoralis minor muscle (image 2).
 - Regional blockade:
 - Two **single shot paravertebral nerve blocks at the T1 and T2 levels**, respectively (upright)
 - **C5 specific interscalene nerve block** and a **superficial cervical plexus block** (supine)
 - Total of **30 cc of 0.5% bupivacaine with dexamethasone 4mg and epinephrine 5mcg/mL** injected
- ❖ Patient underwent FRR, scalenectomy, and venolysis of the right subclavian under GA with RA adjuvants as described.
 - Pain scores of 0/10 for the first 12 hours post-operatively
 - On post-operative day one, ~24 hours following block placement,
 - Pt recalled noticing blockade resolution overnight at 18h post op
- ❖ Uncomplicated remainder of hospital course, pain scores ranging from 0-5/10 until discharge on 10/26

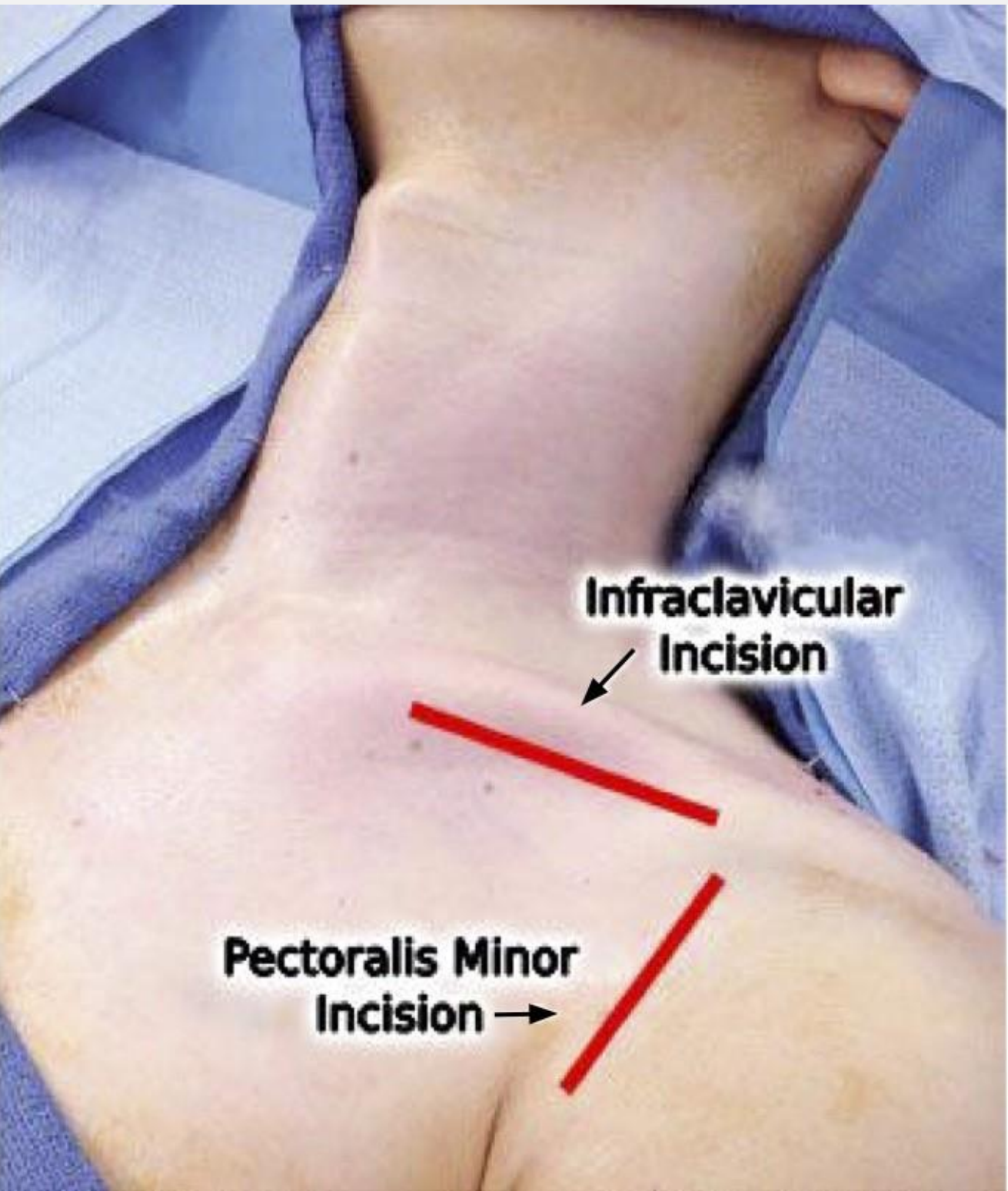


Image 2. Locations and magnitudes of surgical incisions

DISCUSSION

Providing adequate dermatomal coverage with regional techniques can be challenging and must be tailored based on the approach taken (trans-axillary, supraclavicular, infraclavicular, posterior, or video-assisted thoracoscopic approach (1))

The described patient underwent FRR via an infraclavicular approach, which utilized an additional incision on the anteromedial shoulder.

- ❖ Cutaneous dermatomal innervation of these incisions arises from the C5, T1, and T2 nerve roots.
- ❖ Possible small contribution by supraclavicular nerve (C3-C4)
- ❖ A combination of the **superficial cervical plexus, interscalene, and T1-T2 paravertebral nerve blocks** was successfully used to manage pain in this young male patient.

Alternate RA for other surgical approaches to FRR

- ❖ **T1 and T2 paravertebral blocks with T1 catheter placement** (infraclavicular approach with single incision) (3)
- ❖ **Pectoral nerve block** targeting T2-T6 (trans-axillary approach) (4)

- ❖ **Erector spinae plane (ESP) blocks** have been shown to decrease pain scores and increase patient satisfaction, but not to significantly affect post operative opiate requirements (3)

Through clear communication with the surgical team, careful consideration of dermatomal targets and single shot blockade versus catheter placement, we suggest that it is possible to provide operative pain relief, decrease post-operative opiate requirements, and simplify pain regimens by utilizing RA in this unique and challenging patient population.

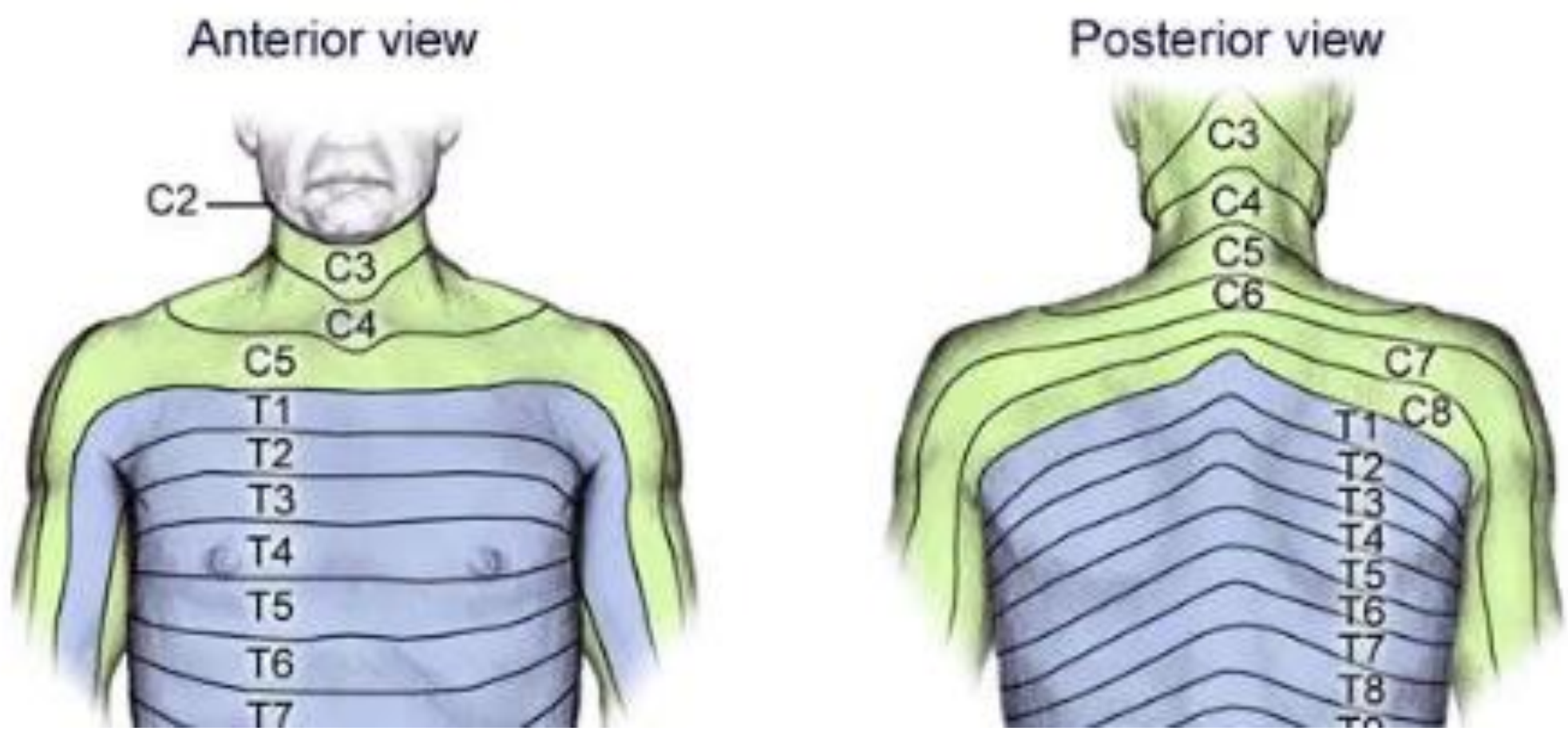


Image 1. Diagram illustrating anterior and posterior dermatomal distributions of cervical and thoracic sensory nerves

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