

Overcoming Altered Anatomy: Ultrasound-Guided Infraclavicular Block in a Patient With Thalidomide-Associated Phocomelia

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Learning Objectives:

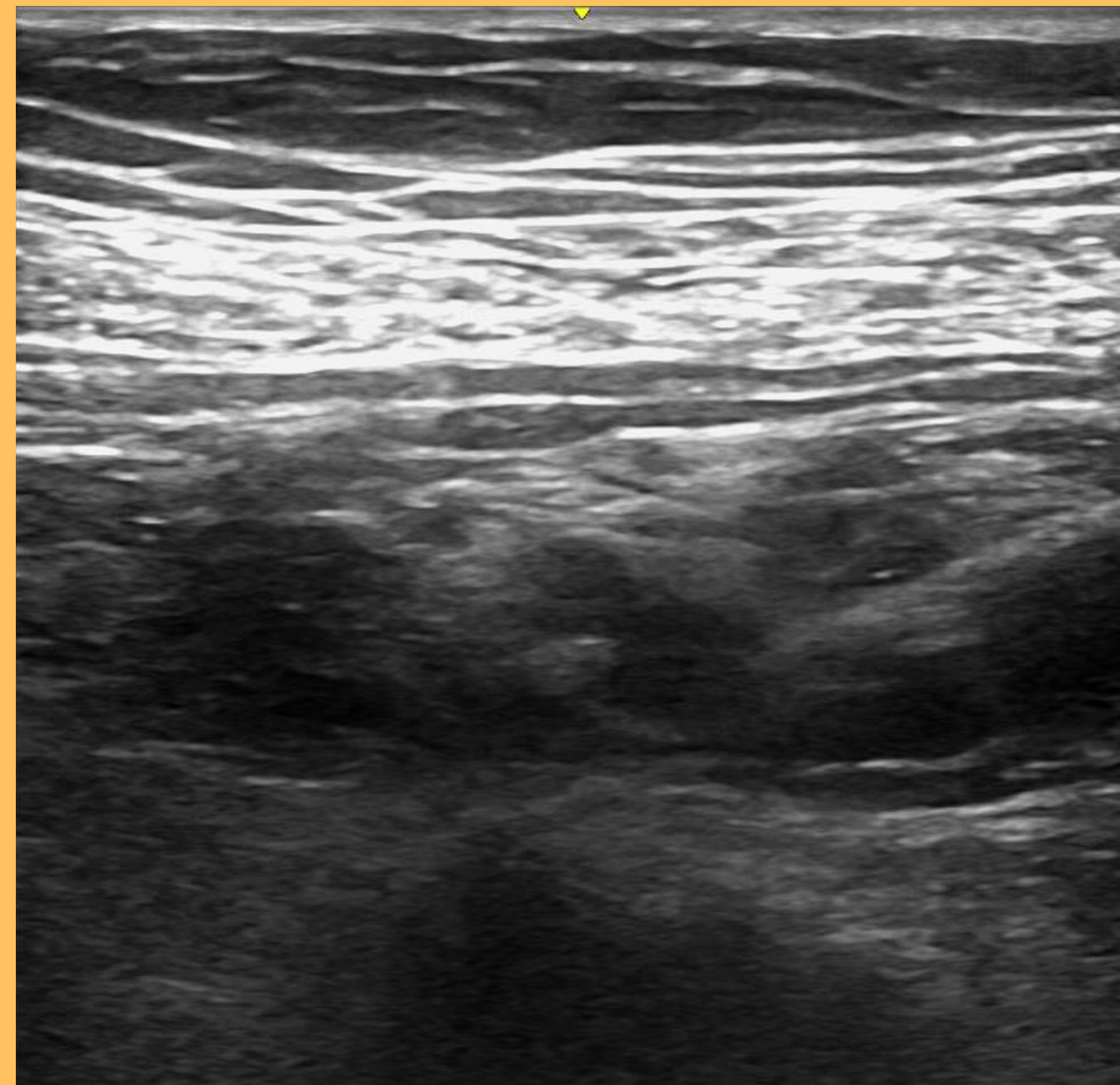
- Define phocomelia and its perioperative challenges for regional anesthesia.
- Explain how ultrasound-guided infraclavicular block overcomes altered anatomy.
- Apply an individualized ultrasound-guided regional anesthesia plan (positioning, approach, local anesthetic) and evaluate postoperative analgesic effectiveness.

Case Report:

63 year old female with history of phocomelia secondary to maternal thalidomide exposure in utero with resultant left upper extremity hypoplasia. She previously underwent several orthopedic procedures for limb lengthening and deformity correction. She presented to UTMCK following a ground level fall that resulted in a left radius and ulnar nonunion fracture. Patient was evaluated by orthopedic surgery team, which was concerned due to the increased complexity of care, significantly altered anatomy, previous malunions, complex arm lengthening surgeries, and no bony landmarks for discriminating the neurovascular bundles and deep structures. She was scheduled for revision nonunion of left radius and ulnar fractures.

On the day of surgery, surgical team requested a regional block of left upper extremity as an adjunct to general anesthesia to assist with post-operative pain control. Given patient's significant limb hypoplasia, there was some concern for identifiable anatomy, including neurovascular bundles. It was decided to pursue a left infraclavicular block with ultrasound guidance. A brief neurological exam of the operative extremity was performed, which was grossly unremarkable. Following a discussion of possible risks, the patient was positioned for the block after placement of the appropriate ASA monitors and the administration of oxygen via nasal cannula. The left infra-clavicular area was then prepped in a sterile fashion, and ultrasound was used to identify the infra-clavicular brachial plexus. With the arm internally rotated and adducted, the infra-clavicular area was scanned to reveal the blood vessels and cords of the brachial plexus. A 22g 30 degree 80 mm insulated needle was inserted in-plane to the ultrasound beam. After negative aspiration, incremental injection of 25 ml's local anesthetic solution containing ropivacaine 0.5% and dexamethasone 4 mg was seen spreading around the location of the neural elements to be blocked and vascular puncture was avoided.

The surgical case lasted approximately 2 hours, and the only pain medications that she received perioperatively were 975mg acetaminophen preoperatively and 100mg of fentanyl on induction. Following the case, the patient was evaluated for post-operative pain control. She endorsed minimal pain, and required no additional pain medication in the PACU. Following a 1 hour stay in PACU, she remained vitally stable with minimal pain and was discharged home the same day.



References:

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Discussion:

Phocomelia is a rare congenital limb malformation characterized by underdeveloped or absent limbs, most famously associated with in utero exposure to thalidomide.¹ Patients with this condition often present with complex anatomy due to congenital deformities and multiple corrective surgeries, making regional anesthesia technically challenging. In such cases, traditional surface landmarks may be unreliable or absent, and prior surgical alterations can distort tissue planes and nerve pathways.²

Ultrasound-guided regional anesthesia (UGRA) offers significant advantages in patients with altered anatomy. It allows real-time visualization of target nerves, vascular structures, and surrounding tissues, improving block precision and reducing complications.³ The infraclavicular approach to the brachial plexus is a reliable technique for surgeries involving the distal arm, offering a low risk of phrenic nerve involvement compared to supraclavicular or interscalene blocks.⁴ Studies have also shown that this approach provides consistent blockade of the musculocutaneous nerve and superior tourniquet tolerance compared to the axillary technique.⁵

In this case, a successful ultrasound-guided infraclavicular block was performed in a patient with significant upper extremity hypoplasia and multiple previous orthopedic procedures. Despite the absence of traditional landmarks, ultrasound enabled identification of the neurovascular structures and guided safe deposition of local anesthetic. The patient required minimal systemic analgesia intraoperatively and reported excellent pain control postoperatively, consistent with literature supporting the opioid-sparing benefits of regional anesthesia in orthopedic trauma.⁶

While the use of regional anesthesia in patients with congenital limb malformations is infrequently reported, this case highlights its feasibility and efficacy when guided by ultrasound. This case contributes to the limited literature on regional anesthesia in patients with congenital limb abnormalities and supports the use of UGRA as a valuable tool in these complex clinical scenarios.