

# RAPTIR: Retroclavicular Approach to the Infraclavicular Region

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## Background and Benefits

- Closed reduction of long bone fractures is a frequent procedure performed in the Emergency Department and requires analgesia to facilitate successful reduction and immobilization. This is often performed with parenteral sedation, however ultrasound-guided regional anesthesia (UGRA) provides a feasible alternative modality and helps reduce anxiety, pain, and adverse effects that occur from receiving sedation.

## Method

### Positioning

Patient is placed in a semi-recumbent supine position with the affected arm adducted to the side in the position of most comfort. A blanket is then placed under the ipsilateral back. Patients head is rotated away from affected limb. Operator stands at the head of the bed with US system at an easy view.

### Scanning

High-frequency linear transducer placed over the medial clavicle with marker aiming toward the head. Transducer is then slid along the clavicle to the deltopectoral groove and rotated towards the axilla. While sliding, the axillary artery is visualized as it comes from under the clavicle and courses away from the rib cage. Identify the extra thoracic portion of the axillary artery which will be apparent when the second rib leaves your view. Injection site is identified here just posterior to the axillary artery.

### Injection

With transducer in place, identify your needle site approximately 2cm proximal to the clavicle. A general anesthetic wheal is placed over area of insertion. Block needle is then inserted through the "blind zone" created by the clavicle. Needle should be angled anterior to avoid pneumothorax. After approximately 3cm, needle tip should be seen emerging from the clavicle. Target location is posterior to the axillary artery. A slight click should be felt when passing through the sheath here. Aspirate to check for vasculature infiltration. Anechoic fluid should then be seen spreading in fascial sheath. Once you see appropriate spread of fluid, 35-40 mL's of anesthetic is injected within sheath.

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## Results



- Above: Figure 1: Presentation showing grossly misplaced forearm structures requiring significant closed arm reduction
- Below: Figure 2: Sagittal view of the needle tip entering beneath the axillary artery with injection of anesthetic into the nerve sheath



- Above: Figure 3: Appropriate prep for needle placement showing cleansing of the supra and infraclavicular areas



- Below: Figure 4: A previously anxiously and distressed child showing significant relief with anesthetic block and relief of anxiety surrounding the appearance of his arm



## Discussion

- Here, we present a case of a 6-year old male who presented with a right mid-shaft fracture of the radius and ulna after a fall on an outstretched hand. A close relative had previously had an adverse reaction to intravenous ketamine, and so with the goal of avoiding parenteral sedatives, a RAPTIR nerve block was performed under dynamic ultrasound guidance using 0.5% Bupivacaine. A RAPTIR nerve block can be an excellent alternative in patients whom sedation is contraindicated or wished to be avoided. Complete anesthesia of the right upper extremity was achieved within approximately 30 minutes, and successful reduction was performed at bedside. Regional anesthesia in this manner allowed the patient to be transported to Radiology after his bedside reduction for serial radiographs. This prolonged anesthesia allowed the time to radiographically confirm reduction prior to splinting and provided sustained analgesia after ED discharge. Not only did the patient have a significant reduction in pain following the procedure, the patient was also able to achieve a significant amount of anxiety reduction regarding his situation.

## Conclusion

- RAPTIR, or the retroclavicular approach to infraclavicular region, is an excellent alternative to regional anesthetic. Evidence has shown that using this method, relief can be achieved under safer conditions. Patients are able to achieve quicker relief and have safer outcomes.

## References

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