

Paravertebral block for multiple rib fractures in an anticoagulated trauma patient

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Introduction

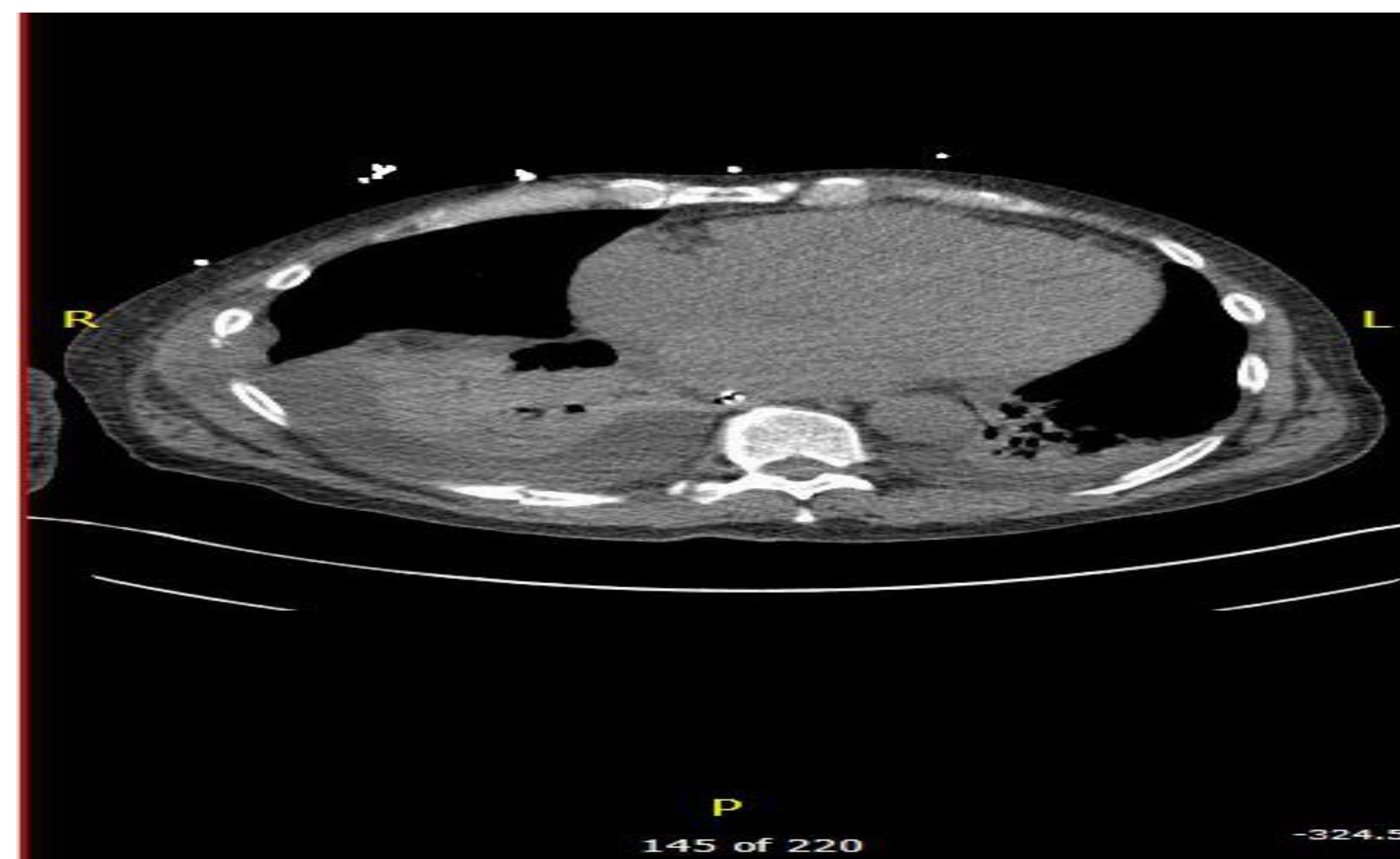
- ❖ The use of oral direct Xa inhibitors (xabans) has become more popular due to superior prevention of ischemic stroke in high-risk patients with atrial fibrillation, prothrombotic or hyper-coagulable states as well as for the management of deep venous thrombosis (DVT) and pulmonary embolism (PE) in comparison to warfarin.
- ❖ However, rapid reversal of this drug class has proven more challenging given the requirement of coagulation factors especially in patients with severe hemorrhage following acute trauma and/or those requiring emergency surgeries or invasive procedures.
- ❖ Reversing anticoagulated state before performing paravertebral blocks is crucial to minimizing the risk of bleeding complications, particularly hematoma formation, which can lead to serious consequences such as nerve injury, spinal cord compression, or even death. The use of apixaban in this case increases the risk of bleeding during invasive procedures including regional anesthesia

Case Presentation

- ❖ 52-year-old male with a PMH significant for HTN, CHF with EF of 25%, atrial fibrillation on direct Xa inhibitors and ETOH abuse and noncompliance with medication due to issues with insurance presented to the ED after falling from a motorized bicycle and sustaining head injury with no loss of consciousness (LOC).
- ❖ Upon admission, he tested positive for ethanol (ETOH), cannabinoids, and oxycodone. Imaging revealed multiple injuries, including right elbow edema and abrasion, forehead abrasion, acute right frontal intraparenchymal hemorrhage (IPH), small right frontal subgaleal hematoma with local mass effect, and right acute rib fractures (T3-10) with a small right hemothorax. The patient received activated prothrombin complex concentrate in the Emergency Department to reverse the anticoagulation status.

Hospital Course

- ❖ The patient was subsequently admitted to ICU for acute traumatic brain injury (TBI) and respiratory failure due to right sided chest wall pain.
- ❖ Right T4 and T7 paravertebral catheters were placed in the ICU using real time ultrasonography.
- ❖ The procedure was placed with the patient in the sitting position using a low frequency curvilinear transducer and an 18 G Tuohy needle was utilized to place and secure catheters at 11 cm at the skin. Saline was used for hydro-dissection during catheters placement with negative aspiration prior injecting local anesthesia.
- ❖ Intermittent boluses of Ropivacaine 0.2% 6 mL every 30 minutes with no basal rate was started with excellent pain control. Patient was resumed on 10 mg direct Xa inhibitor on day 5. The PVB catheters were removed on day 11. Patient had a prolonged hospital course due to multiple injuries and was discharged on day 25.



CT scan showing right acute rib fractures (T3-10)

Discussion

- ❖ Paravertebral nerve block is an excellent alternative to neuraxial blockade for management of rib fracture pain as it provides unilateral blockade with excellent pain control; reduces the risks of motor weakness, difficulty ambulating and urinary retention that are often associated with epidural blockade; and is easier to perform particularly in cases where placement of epidural catheter is difficult or contraindicated such as the case of patients with pre-existing coagulopathy and/or on anticoagulation such as cardiac patients or those with thrombocytopenia.
- ❖ Despite this increased safety profile, PVBs are considered deep blocks (paravertebral space is not compressible) and has an increased risk of vertebral canal hemorrhage with continuous PVBs. Our patient had a severe intracranial hematoma that required immediate reversal of apixaban, which also facilitate placement of PVB catheters.

Conclusion

- ❖ Meticulous management of anticoagulation and careful consideration of the patient's clinical status are essential to safely perform regional anesthesia, such as paravertebral blocks, in patients with complex medical histories, minimizing the risk of bleeding complications and ensuring optimal outcomes.

References: Bhalla PI, Solomon S, Zhang R, Witt CE, Dagal A, Joffe AM. Comparison of serratus anterior plane block with epidural and paravertebral block in critically ill trauma patients with multiple rib fractures.

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