

Continuous supra-scapular nerve block for analgesia of scapular fracture

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Fracture of the scapular is uncommon but painful. A case is described in which a comminuted scapular fracture was treated with a continuous suprascapular nerve block. With the patient lying supine an epidural needle was directed towards the scapular notch via a superior approach and an epidural catheter was placed when the notch was believed to have been identified. Repeat injections of 10 ml bupivacaine 0.25 per cent with 1/200,000 epinephrine provided analgesia within minutes and a duration of 8–10 hr. Injection of 10 ml radio-opaque dye demonstrated the catheter to be lateral to the scapular notch. However, dye dispersed throughout the suprapinous fossa including the scapular notch thus blocking the suprascapular nerve. This case demonstrates that continuous suprascapular nerve block can be performed for five days and that location of the scapular notch is less important than previously thought.

Quoique rare, la fracture comminutive de l'omoplate n'en est pas moins très douloureuse. Nous en avons traité un cas avec un bloc continu du nerf sus-scapulaire. Avec le patient en décubitus dorsal, nous avons visé l'échancrure coracoïdienne par une approche supérieure et y avons glissé un cathéter épidural. Des injections répétées de bupivacaine 0,25 pour cent avec adrénaline 1/200 000 ont procuré une analgésie débutant en quelques minutes et se prolongeant de 8 à 10 hre. L'injection de 10 ml de médium radio-opaque, tout en démontrant que le cathéter était en externe de l'échancrure, a permis de voir que toute la fosse sus-épineuse en était couverte jusqu'à l'échancrure coracoïdienne où passe le nerf sus-scapulaire. Il est donc possible de faire un bloc continu du nerf sus-scapulaire pendant cinq jours et que pour ce faire, la localisation de l'échancrure coracoïdienne n'est pas aussi importante qu'estimé autrefois.

Key words

ANAESTHETIC TECHNIQUES: regional, suprascapular nerve block;

FRACTURE: scapular, analgesia.

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Scapular fracture is an uncommon but painful injury which is frequently associated with injuries involving the thorax and craniospinal axis. We report a case of chest trauma where continuous suprascapular nerve block was used to provide analgesia for a comminuted scapular fracture.

Case report

A 53-yr-old 74 kg man working at a construction site fell approximately 12 ft landing on his right shoulder and back. He suffered loss of consciousness at the site and had a generalized seizure in the emergency room. Intravenous diazepam was administered to stop the seizure. His trachea was subsequently intubated and his lungs were hyperventilated. He was sedated with fentanyl and immobilized with pancuronium. His other injuries included a severely comminuted fracture of the right scapula, fracture of right ribs 3 to 9 and a compression fracture of T₁₁. A CT scan of his head revealed no apparent brain injury. A CT scan of the T₁₁ fracture showed the vertebral body to be encroaching upon the spinal canal but not to be compressing the spinal cord. He had no other injuries. He was a two pack a day smoker with bronchitis but no history of respiratory problems. Otherwise he was healthy.

He was transferred to the intensive care unit for pulmonary ventilation, observation and analgesia. Analgesia was provided with an intravenous fentanyl infusion running at 75 µg·hr⁻¹. The pancuronium was reversed and his trachea was extubated. He did not have a flail chest but demonstrated marked splinting of his right chest. Intravenous analgesia with fentanyl led to respiratory depression before achieving adequate analgesia. Epidural analgesia was contraindicated because of the unstable T₁₁ fracture. It was decided to perform an interpleural block as described by Rocco *et al.*¹ Excellent analgesia for the rib fractures was obtained with 20 ml bupivacaine 0.5 per cent with 1/200,000 epinephrine repeated every 8–10 hr as required. However, severe shoulder pain from the scapular fracture limited chest physiotherapy.

A suprascapular nerve block was performed for control

of the shoulder pain. Because of the vertebral fracture the patient could neither sit nor be placed in the prone position. It was decided to try to block the suprascapular nerve by a superior approach with the patient supine. The scapular spine was palpated and its midpoint determined. Using sterile technique a 22-gauge spinal needle was introduced cephalad and lateral to the midpoint of the scapular spine. It was advanced in a plane parallel to the bed, in a caudad direction until the scapular spine was reached. The needle was then "walked" in a medial, anterior and cephalad direction in an attempt to locate the scapular notch. Because of the fracture lines and the acute angle of the needle to the scapula, the notch was difficult to locate. When what was believed to be the suprascapular notch was identified, 10 ml one per cent lidocaine with 1/200,000 epinephrine was injected which resulted in complete resolution of his shoulder pain. No loss of skin sensation over the shoulder was detectable.

To facilitate repeated injections an 18-gauge epidural catheter was introduced through a 17-gauge Tuohy needle placed slightly lateral to the spinal needle. The catheter was sutured to the skin and was used successfully for five days with repeated injections of 10 ml bupivacaine 0.25 per cent with 1/200,000 epinephrine. Analgesia of the shoulder joint was excellent and permitted good chest physiotherapy. The duration of the suprascapular nerve block ranged from 8–10 hr, as did the interpleural block. Both the suprascapular and interpleural catheters were usually "topped up" at the same time. No clinical evidence of bupivacaine toxicity was noted during the time the catheters were used and Covino has observed with interpleural catheters that "100–150 mg of bupivacaine should not result in toxic blood levels".²

The location of the catheter tip was documented by the injection of radio-opaque dye. Injection of 1 ml of contrast dye showed the catheter tip to be quite lateral to the scapular notch and suprascapular nerve. However, when injected with a volume of contrast dye equal to that of local anaesthetic (10 ml) the entire length of the suprascapular fossa contained dye which explained the good analgesia provided with the catheter in this location (Figure 1).

Discussion

Scapular fractures are uncommon injuries which are usually treated conservatively with immobilization.³ They are, however, quite painful and when present with other injuries may prevent adequate physiotherapy. Suprascapular nerve block has been used to relieve the pain of acute and chronic bursitis, arthritis and partial capsular tear of the shoulder, as well as for reduction of acute anterior shoulder dislocations.^{3–6} We believe that this is the first report of the use of suprascapular nerve block for



FIGURE 1 Following injection of 10 ml of contrast the entire length of the suprascapular fossa was opacified.

analgesia of scapular fracture and the first report of the use of a catheter for continuous block of the suprascapular nerve. Interpleural analgesia gave good relief of the pain originating from his rib fractures and has been described previously for analgesia in this situation.¹

The suprascapular nerve arises from the upper trunk of the brachial plexus consisting of C4, C5 and C6 nerve roots and supplies sensation to the scapula, the acromioclavicular joint, and the posterior and superior shoulder joint, but not to the skin nor the anterior and inferior shoulder. It also supplies motor function to the suprascapular and infraspinatus muscles.^{4–8}

The suprascapular nerve runs through the scapular notch, which lies on the superior aspect of the suprascapular fossa where the coracoid process fuses to the scapula (Figure 2). The suprascapular nerve is generally blocked before it branches by placing local anaesthetic in the suprascapular notch. The most commonly used technique involves introducing a needle perpendicular to all planes approximately 2.5 cm superior and lateral to the midpoint of the scapular spine. The notch is then located by seeking a loss of bony resistance.⁴ The technique we used is somewhat similar to an alternative approach described by Edeland and Stefansson.⁵ With this technique the needle is not introduced perpendicular to the skin but tangentially at a point cephalad to the spine of the scapula. Such an approach allows the cranial border of the scapula and the scapular notch to be reached in a supine patient.

Brown *et al.* reported that in patients with arthritis undergoing radio-frequency ablation of the suprascapular nerve techniques which utilized blind needle placement

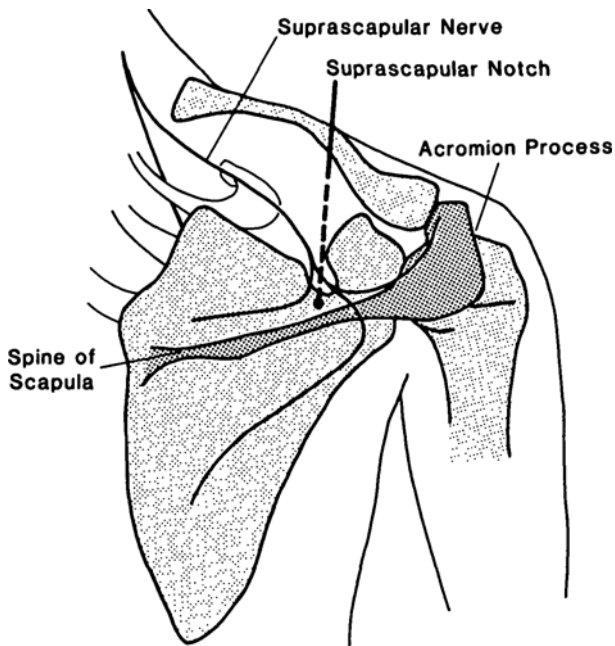


FIGURE 2 Anatomical relationship of the suprascapular nerve and scapula.

using anatomical landmarks were unreliable to locate the scapular notch.⁸ Only fluoroscopy gave consistent placement of the needle at the scapular notch. We considered transferring the patient onto the fluoroscopy table to be dangerous and therefore did not pursue this option.

A technique of blocking the suprascapular nerve has been described which does not rely on locating the suprascapular notch but rather utilizes a blind injection into the floor of the suprascapular fossa.⁶ We have demonstrated radiographically why this technique is successful. If sufficient volume of local anaesthetic is used the entire suprascapular fossa is flooded with anaesthetic. Thus the location of the needle at the scapular notch does not appear to be critical for obtaining analgesia.

Potential complications of suprascapular nerve block include intravascular injection of local anaesthetic, nerve trauma and a <1 per cent incidence of pneumothorax.⁴ Other techniques such as continuous interscalene brachial plexus block could be used for scapular fractures and shoulder injuries.⁹ However, we feel that suprascapular nerve block is more specific and has fewer potential complications than interscalene block. Interscalene block complications include those of suprascapular nerve block plus phrenic nerve block, vertebral artery injection, epidural block and spinal anaesthesia.¹⁰

In summary, we have described the use of an epidural catheter placed in the suprascapular fossa for continuous

suprascapular nerve block to provide analgesia for a scapular fracture. Catheter placement at the suprascapular notch is not critical for successful analgesia. The suprascapular nerve can be blocked with the patient in the supine position.

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