

Erector spinae plane block provides complete perioperative analgesia for chronic scapulothoracic pain

Madam,

With the recent prolific interest in intermuscular plane blocks that offer possible paravertebral spread as a safer alternative to the more traditional risky and time-consuming neuraxial and paravertebral blocks, applications and indications for these plane blocks are still being delineated. Forero initially described the erector spinae plane (ESP) block with regard to chronic thoracic neuropathic pain.

In this case report, we describe a 30-year-old female patient with chronic moderate-to-severe scapulothoracic pain and rotator cuff tendinopathy that presented for arthroscopic scapulothoracic bursectomy and subacromial steroid injection. She underwent a preoperative ESP followed by placement of an interscalene brachial plexus catheter. Prior to placement of the interscalene catheter, her moderate/severe scapulothoracic pain was already subsiding. Before induction of general anesthesia, her pain had receded completely – we believe this is a result of the ESP as not enough time had passed for her interscalene block to “wear on.” She required no opioids intraoperatively or in the postoperative period.

We submit this case report to support proof-of-concept that the ESP is an effective analgesic modality in the treatment of disorders of the thoracic chest wall and believe this lends another possible indication to its application.

The patient is a 30-year-old Caucasian nurse with a 4-year history of chronic right scapulothoracic, trapezial, and shoulder pain after administering chest compressions to a large patient. Her pain was characterized as moderate/severe and localized to just cephalad to the inferior pole of the scapula along the medial border. She had aggressively attended physical therapy with the application of multiple modalities such as a TENS (transcutaneous electrical nerve stimulation) unit, massage, and nonsteroidal anti-inflammatory drugs in attempts to alleviate her pain. Her medical history was remarkable only for well-controlled asthma and occasional migraines.

She was eventually seen in consultation by a physical medicine and rehabilitation physician who diagnosed her with myofascial pain syndrome with trigger points. Plain films of her cervical

spine were normal. A magnetic resonance imaging of the affected shoulder demonstrated a small partial articular surface tear of the infraspinatus tendon and mild supraspinatus tendinosis.

She was seen by an orthopedic physician for evaluation of her shoulder pain and it was felt that in tandem with her rotator cuff tear/tendinitis that she likely had subscapular bursitis. She was referred to a colleague in pain management. At that time, her pain was at best 4/10 at rest and 8/10 with exertion. After evaluation, she received a diagnostic trigger point injection in the subscapular region with temporary relief of her pain. The orthopedic surgeon then decided on the basis of these results to schedule her for arthroscopic scapulothoracic/subscapular bursectomy and a subacromial steroid injection.

The surgeon had requested a general anesthetic with preoperative placement of an interscalene brachial plexus catheter. After interviewing and evaluating her, it was our feeling that we could perhaps provide superior analgesia to an interscalene block alone by additionally delivering posterior thoracic anesthesia, as she was more symptomatic from a pain standpoint from her subscapular region than her shoulder. A discussion was had with the attending surgeon who had initially planned to infiltrate the area of surgery with a local anesthetic that delivering chest wall anesthesia would likely be more beneficial – though we all agreed that an epidural catheter or paravertebral block would likely be too time-consuming and risky for a relatively short same-day procedure. Informed consent was obtained from her regarding the anesthetic plan to include both an erector spinae plane (ESP) block and an interscalene catheter.

Prior to beginning the block, she stated that her subscapular pain was rated 6/10. We elected to perform the ESP block first to assess its efficacy prior to introducing a confounding factor such as the interscalene brachial plexus catheter. We placed her in a seated position with her arms resting comfortably on a table to produce exaggeration of her thoracic kyphosis and procedural sedation was administered [Figure 1]. Her point of maximal tenderness was very medial on her posterior chest wall – it was localized to the medial border of the scapula about 4 cm proximal to the tip of the scapula. We decided to perform a T8 level ESP, which was the corresponding dermatome to the patient's point of maximal tenderness and to provide analgesia down to the T10 dermatome to include the tip of the scapula and the arthroscopic portals. Using the *vertebra prominens* (spinous process of C7) as our reference starting point, we counted down the thoracic spinous processes and marked the medial border of the scapula [Figure 2]. We then employed ultrasound with a linear 15-6 MHz

HFL 50×p transducer (Sonosite Xpore, Fujifilm Sonosite, Bothell, WA, USA) in the midline to identify the T8 spinous process [Figure 3]. We scanned laterally identifying the transverse process of T8 [Figure 4] and the transition to the thoracic ribcage [Figure 5]. Under direct ultrasound visualization using an “in-plane” approach, we injected 20cc of 0.25% bupivacaine with 2 mg of dexamethasone added deep to the erector spinae muscle in the parasagittal plane corresponding to the transverse processes, ~2–3 cm lateral to the midline [Figure 6]. Local anesthetic was observed to spread under the ventral fascia of the erector spinae musculature, causing dorsal displacement of the erector spinae muscle off of the transverse process. We then placed her in the supine position and placed an interscalene brachial plexus catheter after administering 20cc of 0.5% ropivacaine around the brachial plexus.

At the terminus of the placement of the brachial plexus catheter, we reassessed her level of posterior thoracic pain prior to the commencement of her surgical procedure. She was quite pleased as she indicated her pain at rest (static pain) had dropped to a 0 or 1 and that her

pain with scapular range-of-motion (dynamic pain) had likewise dropped to a 0 or 1. She went on to inform us that she had not been this comfortable since prior to her injury 4 years ago. She underwent arthroscopic scapulothoracic bursectomy with subacromial steroid injection under general anesthesia. She required no opioid medication throughout her entire perioperative stay at our facility and none in her immediate postoperative period; she was quite pleased with the block.

A cursory investigation of recent literature in regional anesthesia demonstrates an avid interest in the introduction and application of intermuscular plane blocks. More recent forays into this area uncover a growing interest in plane blocks that afford paravertebral spread providing truncal blockade such as the quadratus lumborum block^[1] and the described ESP blocks,^[2] akin to a “poor man’s neuraxial/paravertebral.” Part of what makes these blocks so attractive is the ability to provide somatic and visceral analgesia while



Figure 1: Patient positioning for block administration

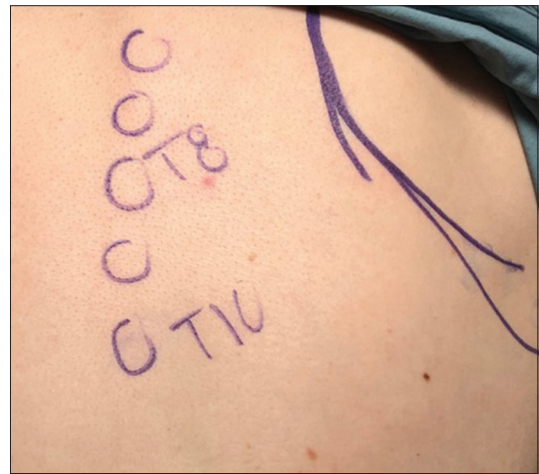


Figure 2: Thoracic spinous processes marked along with medial border of scapula

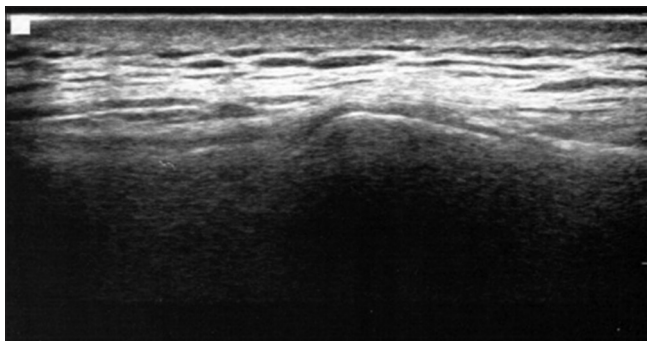


Figure 3: Spinous process of T8 in midline to identify target level for erector spinae plane

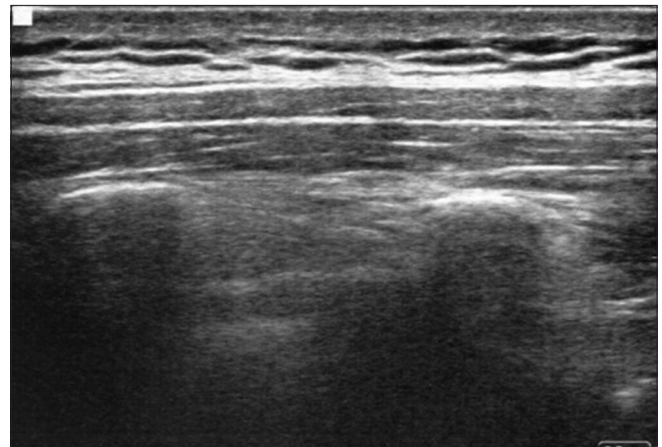


Figure 4: Ultrasound probe moved laterally to demonstrate deeper, more rectangular appearance of transverse processes

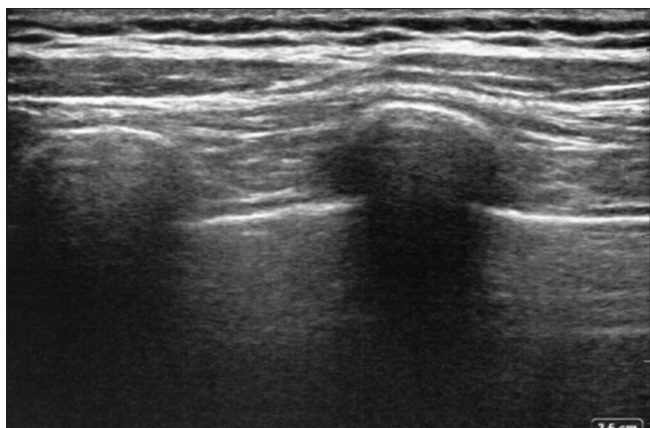


Figure 5: Ultrasound scanning lateral to transverse processes demonstrating rounder and more superficial appearance of ribs

mitigating much of the risk and concern with neuraxial or paravertebral techniques. Additionally, the risk profile and labor-intensive nature of paravertebral or neuraxial techniques may be seen as excessive for same-day or outpatient procedures – a niche that would seem very attractive for the employment of a safer plane block with some paravertebral spread.

Forero *et al.*^[2] originally described the ESP with regard to the treatment of chronic thoracic pain; however, more recent articles showcase this block finding application for neuropathic pain stemming from herpes zoster,^[3] for analgesia in thoracic procedures and in rib fractures,^[4] and also in surgical procedures involving the breast.^[5,6] The ESP affords both somatic and visceral analgesia by the spread of local anesthetic into the paravertebral and intercostal spaces. While we have placed a handful of ESP catheters for patients with chronic pain with good results, at the time of this writing, we are unaware of any large prospective trials demonstrating their efficacy; as such, more work needs to be done in this area.

What made the ESP so attractive in our particular case was that we had a patient with an established history of moderate-to-severe pain presenting for a same-day procedure. While a paravertebral or neuraxial technique may have been considered the gold standard, as previously mentioned, we felt this posed unnecessary risk and labor requirements for the expeditious nature of her procedure. An additional point of consideration (though not employed in this particular case) is that we could have potentially tried to place an indwelling catheter that she could go home with – though the relatively subcutaneous nature of the block location may predispose to catheter dislodgement.



Figure 6: Anatomical location of transverse processes delineating injection site

While clearly more work needs to be done to define the exact location of spread of local anesthetic in the ESP block and thus more precise indications for the block, early results are very promising. While we recognize the great work that has been done by our predecessors with regard to breast and thoracic analgesia, we are not aware of any reports relating the application of a truncal block for scapular or orthopedic surgery in general as is described here. However, we advise caution extrapolating the information in our report to other applications of the ESP. Though the subscapular area is a relatively “deep” space, it is still considered to lie outside the thoracic cavity, and thus conclusions cannot be drawn about its efficacy in other scenarios.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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