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Thoracic Erector Spinae Block as Treatment for Pain Related to Inoperable Desmoid Fibromatosis: A Case Report

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Background: Desmoid fibromatosis is a rare, sarcoma-like neoplasm that aggressively invades surrounding soft tissue and is often quite painful. Surgery has historically been the mainstay of treatment. Given the high rates of recurrence and unpredictable nature of the lesions, multidisciplinary therapy may be needed to provide adequate analgesia.

Case Report: A 35-year-old woman with a history of inoperable desmoid fibromatosis was evaluated in our chronic pain clinic for chest wall and axillary pain due to tumor recurrence. An erector spinae plane block markedly improved her level of pain and functional status.

Conclusion: This case report highlights the use of a thoracic erector spinae plane block (ESPB) for an inoperable desmoid tumor of the chest wall. Thoracic ESPB is growing in popularity in the field of interventional pain management, but has few definitive indications due to its relative newness. This case report demonstrates that a thoracic ESPB can be a viable, multiregional pain relief strategy for chest wall tumors since our patient reported enduring pain relief, an improved quality of life, and decreased opioid use as a result of the procedure.

Key words: Erector spinae plane block, desmoid fibromatosis, chronic pain, desmoid tumor, regional anesthesia, case report

BACKGROUND

Desmoid fibromatosis is characterized by benign, locally aggressive tumors of connective tissue that can spontaneously stabilize, regress, and recur (1). The mainstay of treatment had been surgical resection; however, due to their nature of recurrence, recent therapy has shifted to surveillance and medical management, such as tyrosine kinase inhibitors, nonsteroidal anti-inflammatory drugs, chemotherapy medications, and hormonal therapy (2). Despite medical management, many patients experience significant pain, impaired mobility, and functional limitations requiring additional pain medication. This case demonstrates the successful use of a thoracic erector spinae plane block (ESPB) for an inoperable desmoid fibromatosis of the posterior chest wall as a unique approach for lasting pain relief in conjunction with continued medical management.

CASE PRESENTATION

A 35-year-old woman was evaluated in our interventional pain management clinic for right shoulder and back pain in the setting of inoperable desmoid fibromatosis in the subcapsular region and right shoulder. She reported 6 months of severe, sharp, aching, right scapular pain radiating to her neck, right arm, and chest wall. She also reported intermittent right arm

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numbness and weakness. She has a past medical history of low grade myofibroblastic neoplasm in the right axilla, for which she underwent wide local excision; premature ventricular contractions; hepatic adenoma; open-angle glaucoma; undifferentiated mixed connective tissue disease; and fibromyalgia. Her past surgical history includes right chest wall and rib resection for low grade myofibroblastic neoplasm and liver resection for hepatic adenoma.

On physical exam, she had 5/5 strength in her bilateral upper extremities, a decreased range of motion in the right shoulder with adduction and abduction due to pain, and tenderness to palpation along her right shoulder, axilla, scapula, and chest wall. Magnetic resonance imaging of her right arm and brachial plexus (Fig. 1) demonstrated a posterior chest wall mass, deep and inferior to the scapula measuring 5.9 X 3.2 centimeters without evidence of brachial plexus or spinal cord involvement.

She had minimal pain relief from physical therapy as well as a multimodal medication regimen, including: amitriptyline, methocarbamol, gabapentin, oxycodone-acetaminophen, and celecoxib. She was evaluated by the orthopedic surgery service who deemed the lesion inoperable given the nature of the desmoid tumor's recurrence and its location. She was referred for continued medical treatment with the oncology department and was started on targeted therapy with sorafenib.

Because of her persistent symptoms and tumor location, an ultrasound-guided thoracic ESPB was scheduled and performed. The patient was placed in a sitting position and appropriate monitors applied. The posterior thoracic region was prepped and draped in the usual sterile fashion. Using a linear ultrasound probe, the transverse process at the level of T5 was identified. The skin at the needle insertion site was anesthetized with 1% lidocaine without epinephrine. Next, a 22G ultrasound needle was then inserted superior to the ultrasound probe using an in-plane approach in a cephalad to caudad direction. The needle was advanced under ultrasound guidance until the needle contacted the transverse process underneath the erector spinae muscle (Fig. 2). Aspiration was negative for blood, air, or cerebrospinal fluid. A small amount of normal saline was injected at this location and visualized to separate the erector spinae muscle from the transverse process along the fascial plane. Once this was confirmed, 15 mL of 0.5% ropivacaine and 5 milligrams of dexamethasone was incrementally injected.

Fifteen minutes after the injection, the patient was reassessed. She reported significant pain relief and improved right upper extremity mobility to a level she had not felt since prior to her surgery. She reported an 80% reduction in her typical pain for 6 weeks following the procedure as well as significant improvement in her upper extremity mobility and decreased opioid utilization.

DISCUSSION

ESPB is a paraspinal fascial plane block that targets the iliocostalis, longissimus, and spinalis muscles and can also anesthetize the anterior and posterior chest wall based on ventral and dorsal rami spread.

ESPB has been used for a variety of neuropathic and somatic pain conditions affecting the thoracic and lumbar spine. It has been used to treat both chronic

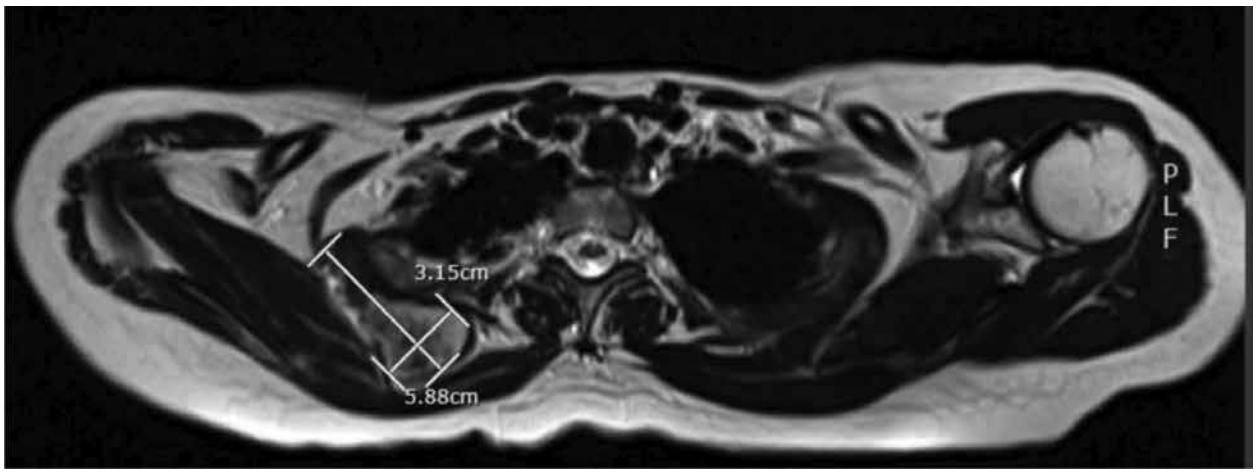

Fig. 1. Brachial plexus MRI (T2-weighted, axial) showing desmoid tumor in the right posterior chest wall.v

and acute pain with the first published cases in 2016 describing its use for postherpetic neuralgia and metastatic rib fractures (3). Other indications include Nissen fundoplication, thoracotomies, ventral hernia repairs, nephrolithotomies, and lumbar fusions.

The mechanism of action of ESPBs is not completely understood. It is an interfascial plane block that is purported to block the ventral and dorsal rami of spinal nerve roots. The local anesthetic is thought to diffuse through the connective tissues to block the spinal nerves proximally at the interverbal foramen. This spread allows for the multidermatomal sensory block of the abdominal and thoracic walls anteriorly, laterally, and posteriorly observed after an ESPB. A recent magnetic resonance image study showed both transforaminal and epidural spread of local anesthetic during the ESPB, further lending support for this suggested mechanism (4).

Our patient's tumor grew in the posterolateral chest wall between the scapula and posterior ribs (Fig. 1). The 5.9 X 3.2 cm tumor was exerting a mass effect on the subscapularis, levator scapula, and trapezius muscles with notable atrophy of these muscle groups. Both neuropathic and nociceptive pain was likely caused by involvement of the cutaneous sensory branches of the intercostal nerves innervating the chest wall as well as the medial branches that arise from the dorsal rami of the thoracic spinal nerves.

Our patient received significant analgesia over a 6-week time period, which is longer than expected from a local anesthetic blockade. Additionally, she achieved both cutaneous sensory blockade and relief of her neuropathic symptoms over that period. This may have been achieved through the additive analgesic effects of steroid and local anesthetic on the thoracic spinal nerves. Her pain did return at 6 weeks, but she

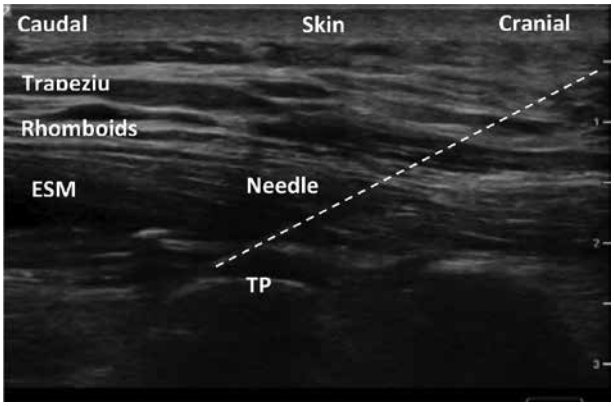

Fig. 2. Erector spinae fascial plane block under ultrasound.
TP, transverse process; ESM, erector spinae muscle

continued to demonstrate reduced opioid utilization thereafter. We plan to trial 10 mg dexamethasone or a depot steroid such as methylprednisolone, which are routinely used for neuraxial injections, to achieve a longer duration of benefit. Alternatively, Forero and colleagues (3) demonstrated that using an indwelling catheter with continuous local anesthetic infusion could extend the duration of analgesia.

CONCLUSION

The purpose of this case report is to add to the growing body of literature showcasing this block's effectiveness in covering a wide range of diseases and conditions, including nonoperable tumors. Our patient experienced enduring pain relief in her shoulder, axilla, and anterior and posterior wall in response to a single injection. Her case demonstrates that a thoracic ESPB can offer effective chronic pain management for posterior chest wall tumors, especially when used as part of a multimodal analgesic plan.

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