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Radiofrequency Ablation for the Treatment of Pain Related to Bertolotti's Syndrome: A Case Report

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Background: Bertolotti's syndrome is a congenital spinal disorder marked by back pain due to a lumbosacral transitional vertebra, often presenting with sacroiliac joint, groin, and hip pain. This condition results from the articulation of the lumbar 5 vertebra transverse processes with the sacrum, causing both radicular and pseudoradicular pain.

Case Report: This is a case report of a patient with bilateral axial low back pain related to bilateral Bertolotti joints who received sustained pain relief after a radiofrequency ablation (RFA) targeting the bilateral L4 medial branch, L5 dorsal ramus, and S1 lateral branch.

Conclusions: Our case report demonstrates the complete resolution of chronic low back pain in a patient with bilateral Bertolotti's syndrome after an RFA targeting the L4 medial branch, L5 dorsal ramus, and S1 lateral branch.

Key words: Radiofrequency Ablation, RFA, Bertolotti Joint, Bertolotti Syndrome

BACKGROUND

Bertolotti's syndrome is a congenital disorder with associated back pain in a lumbosacral transitional vertebra (1). The most common presentation of Bertolotti's syndrome is pain in the sacroiliac (SI) joint, groin, and hip region due to an articulation of the L5 vertebra transverse processes with the sacrum (1,2). Radicular pain may arise from nerve compression or pseudoradicular pain due to bone-on-bone contact at the pseudoarticulate joint of the transverse vertebra. The incidence of Bertolotti's syndrome is debated, with studies estimating that its incidence ranges from 4% to 35% in the general population (2,3). Its etiology is multifactorial, involving both genetic components and influences from an individual's biomechanical factors, including how weight is transmitted across SI joints (2). Patients typically present with low back pain and limited mobility. Diagnosis relies on clinical assessment of pain and advanced imaging demonstrating anomalies, such as enlargement of the transverse processes of the most caudal lumbar vertebrae, which may articulate or be fused with the sacrum or ilium, causing isolated L4-L5 disc disease. While plain x-rays of the lumbosacral spine in an anteroposterior (PA) view are usually sufficient for diagnosing Bertolotti's syndrome, magnetic resonance imaging has a higher accuracy in identifying this condition (3,4).

Initial management of Bertolotti's syndrome consists of conservative interventions, such as nonsteroidal anti-inflammatory drugs (NSAIDs). Physical therapy is also generally recommended to strengthen core musculature, improve spinal mobility, and provide other pain-minimizing modalities (1). If conservative manage-

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ment is unsuccessful, corticosteroid injections under fluoroscopic guidance into the abnormal articulation can potentially provide relief (1). Radiofrequency ablation (RFA) has recently been suggested as an additional method to treat Bertolotti's syndrome, although its clinical use is still not widely established.

CASE REPORT

The patient is a 27-year-old woman presented with an 8-year history of axial low back pain beginning after a motor vehicle collision. She described the pain as a constant cramping, burning sensation at 9/10 intensity on the Numeric Rating Scale (NRS). She was managed by a previous pain provider, and her pain was refractory to physical therapy and analgesics, including NSAIDs, tizanidine, and gabapentin.

Five years prior, the previous pain provider performed simultaneous L3-L5 medial branch blocks and S1-S2 lateral branch blocks on each side, followed by an RFA of the same targets with reported sustained relief for one year. A more recent lumbar spine x-ray from one year prior showed transitional morphology of L5, and bilateral megapophysis of L5 articulating with the sacrum (Bertolotti joints).

After consultation and informed consent, a decision was made to target the Bertolotti joints themselves with a pseudojoint steroid injection. A spinal needle was placed into each of the Bertolotti joints fluoroscopically guided, then, in each pseudojoint, 0.25 mL of Omnipaque 240 was injected confirming spread within the pseudojoint, and a 1 mL solution of 10 mg methylprednisolone and 0.75 mL of 0.5% bupivacaine was injected. At follow-up 3 months later, the patient reported 100% relief for 2-3 weeks after this injection.

The patient also had relief from a previous ablation several years ago, with targets more remote from the Bertolotti joints. Given the previous ablation was several years prior, a repeat block would be needed prior to ablation. A decision was made to limit the nerve blocks to the bilateral L4 medial branches, L5 dorsal ramus, and S1 lateral branches. After informed consent, the skin and subcutaneous tissues were anesthetized with 1% lidocaine at the target site for the nerves. Then, a 25G 3.5-inch spinal needle was placed under fluoroscopic guidance at the junction of lumbar 5 superior articular process and transverse process for the lumbar 4 medial branch. Additional 25G 3.5-inch spinal needles were placed at the sacral ala adjacent to the superior articular process for the lumbar 5 dorsal ramus and lateral to the sacral 1 foramen for the sacral 1 lateral branch. After confirming location with PA view and lateral fluoroscopy, 0.6 mL of 0.5% bupivacaine was injected into each needle. The procedure was repeated on the contralateral side for a bilateral procedure. The patient reported on phone call follow-up that she had 100% relief (NRS-11 reduced from 10/10 to 0/10) for approximately 36 hours.

Subsequently, the patient was brought back to the procedure room and provided informed consent to have an RFA targeting the bilateral lumbar 4 medial branch, lumbar 5 dorsal ramus, and sacral 1 lateral branch nerve. After local anesthetic of skin and subcutaneous tissue with 1% lidocaine, 20G 100-mm insulated curve RF needles were placed at the same target sites listed above for block to the corresponding nerves (Figs. 1 and 2). Motor testing at 3 V and 2 Hz was performed and negative for motor stimulation. A mixture of 1 mL of a 50:50 solution of 4% lidocaine and 0.5% bupivacaine with 1 mg/mL of dexamethasone was used to anesthetize the nerves prior to the RFA. RFA was then completed at 80°C for 90 seconds.

At one-month postablation follow-up, the patient reported ongoing 90% relief with Numeric Rating Scale reduced from 10/10 to 4/10. At 3-month postablation follow-up, the patient reported resolution of her pain with a Numeric Rating Scale of 0/10.

DISCUSSION

Our case report demonstrates the complete resolution of chronic low back pain in a patient with bilateral Bertolotti's syndrome after an RFA targeting the L4 medial branch, L5 dorsal ramus, and S1 lateral branch.

There are few documented cases of RFA being used for Bertolotti's syndrome. One of the earliest reports (7) involved a unilateral RFA at the L5-S1 pseudoarticulation in a 56-year-old woman with right-sided Bertolotti's syndrome, which resulted in 100% pain relief for 16 months postprocedure. Another case series (10) involving 4 patients who received RFA at 3 sites (lateral, middle, and medial) along the pseudoarthrosis also reported significant pain relief 12 weeks postprocedure.

This ablation case is different from prior documented cases, as specific and conventional nerve targets were used rather than placing insulated needles in or around the pseudojoint. A prior pain provider who did not acknowledge the Bertolotti joints in their documentation performed a more widespread ablation with a strong positive outcome. When the patient presented to our

clinic, the Bertolotti joints were identified on imaging and determined to be the source of pain based on diagnostic Bertolotti pseudojoint injections with steroid and local anesthetic. Prior to repeating the nerve blocks, a decision was made to limit the nerve targets to those more adjacent to the Bertolotti joints with a positive outcome.

Limitation

A limitation of this case report is the potential involvement of the L5-S1 facet joints, which may have also contributed to the patient's pain and would have been denervated with this ablation. Additionally, as a single case report, its findings are inherently limited in scope.

Future studies should investigate the innervation of Bertolotti joints, as a review of the current literature does not provide robust evidence regarding the specific nerves responsible for sensory input in patients with Bertolotti's syndrome (2-10). According to Saito et al (11), the dorsal ramus of each lumbar spinal nerve divides into medial, intermediate, and lateral branches. The medial branch innervates the facet (zygapophysial) joints, interspinous ligaments, and multifidus muscle; the intermediate branch supplies the longissimus muscle; and the lateral branch innervates the iliocostalis muscle and overlying skin (11)

Given the anatomical location of Bertolotti joints at L5-S1, it is reasonable to postulate that innervation may arise from the articular branches of the medial branch of the dorsal ramus at L5, with possible contributions from the S1 dorsal ramus if the pseudoarticulation extends caudally (11). Additionally, aberrant or accessory sensory fibers may develop within the periarticular soft tissues of the pseudoarticulation, as observed in other anomalous joints (11).

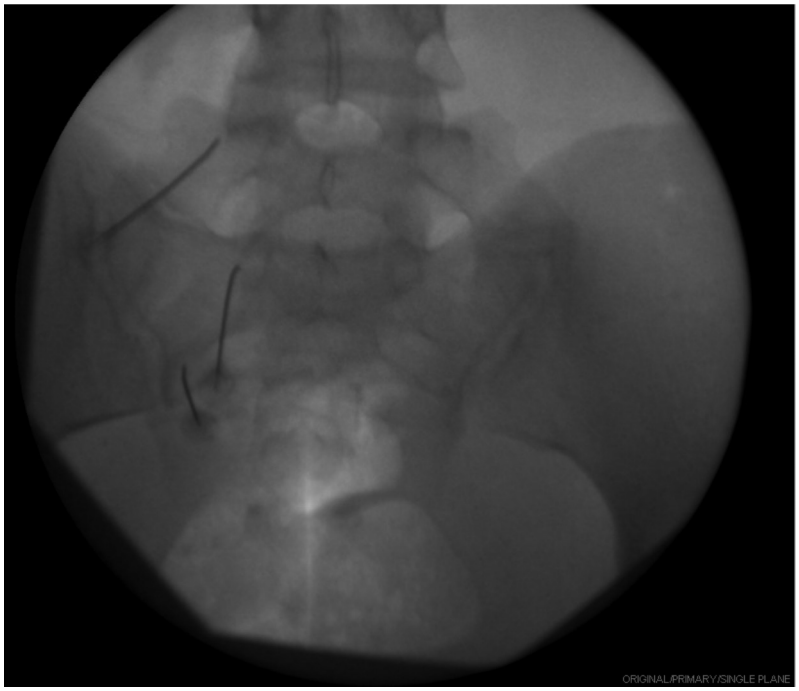

Fig. 1. Fluoroscopic needle placement for left lumbar 4 medial branch, lumbar 5 dorsal ramus, and sacral 1 lateral branch RFA targeting the left Bertolotti joint. RFA, radiofrequency ablation.

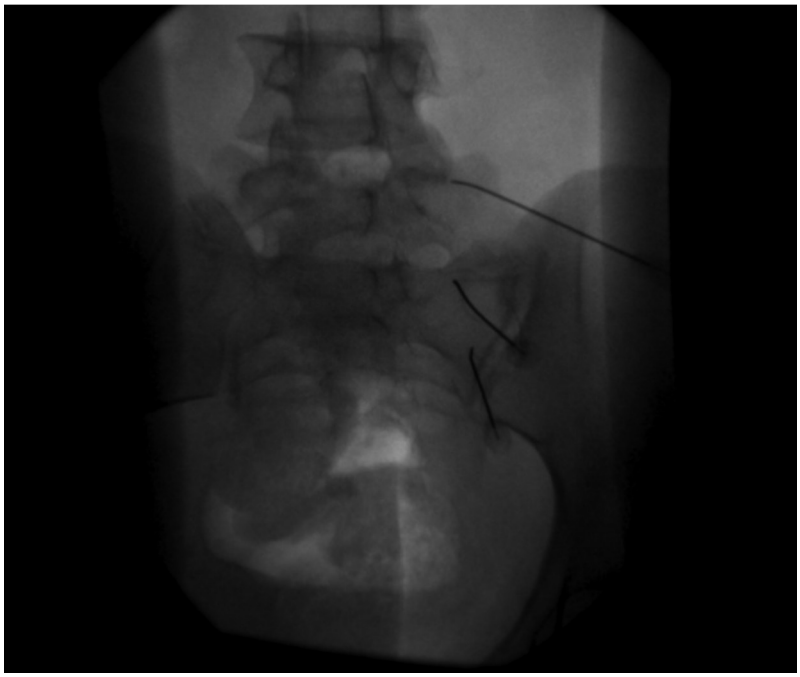

Fig. 2. Fluoroscopic needle placement for right lumbar 4 medial branch, lumbar 5 dorsal ramus, and sacral 1 lateral branch RFA targeting the right Bertolotti joint. RFA, radiofrequency ablation.

A review of previous cases in which RFA was performed for Bertolotti's syndrome demonstrates variability in RFA targets. Targeted blocks have included the L5 medial branch, the Bertolotti joint itself, the S1 transverse process, the sacral alae, and various portions of the pseudoarticulation joint (lateral, middle, and medial) (7,8,10). All patients reported significant pain relief, highlighting the importance of an individualized approach to RFA in the management of Bertolotti's syndrome (7,8,10).

CONCLUSIONS

Ultimately, our case highlights that RFA may be an effective treatment option for low back pain secondary to Bertolotti's syndrome with possible nerve targets of the lumbar 4 medial branch, lumbar 5 dorsal ramus, and sacral 1 lateral branch. Other case reports have shown variable benefit of RFA for Bertolotti's syndrome; however, additional studies are needed to determine which nerves need to be targeted.

REFERENCES

1. Miller AE, Zhang A. Bertolotti syndrome. In: *StatPearls [Internet].* StatPearls Publishing, Treasure Island, FL 2025. www.ncbi.nlm.nih.gov/books/NBK585032/
2. Crane J, Cragon R, O'Neill J, et al. A comprehensive update of the treatment and management of Bertolotti's syndrome: A best practices review. *Orthop Rev (Pavia)* 2021; 13:24980.
3. Zhu W, Ding X, Zheng J, et al. A systematic review and bibliometric study of Bertolotti's syndrome: Clinical characteristics and global trends. *Int J Surg* 2023; 109: 3159-3168.
4. Jain A, Agarwal A, Jain S, Shamshery C. Bertolotti syndrome: A diagnostic and management dilemma for pain physicians. *Korean J Pain* 2013; 26:368-373.
5. Wray JK, Dixon B, Przkora R. Radiofrequency ablation. In: *StatPearls [Internet].* StatPearls Publishing, Treasure Island, FL 2025. www.ncbi.nlm.nih.gov/books/NBK482387/
6. Byrd D, Mackey S. Pulsed radiofrequency for chronic pain. *Curr Pain Headache Rep* 2008; 12:37-41.
7. Burnham R. Radiofrequency sensory ablation as a treatment for symptomatic unilateral lumbosacral junction pseudarticulation (Bertolotti's syndrome): A case report. *Pain Med* 2010; 11:853-855.
8. Philip A, Modzelewska M. Individualizing radiofrequency ablation therapy in two patients with Bertolotti's syndrome. *Ann Clin Case Rep* 2016; 1:1004.
9. Castellvi AE, Goldstein LA, Chan DPK. Lumbosacral transitional vertebrae and their relationship with lumbar extradural defects. *Spine (Phila Pa 1976)* 1984; 9:493-495.
10. Kanematsu R, Hanakita J, Takahashi T, Tomita Y, Minami M. Pulsed radiofrequency treatment for Bertolotti's syndrome presenting with low back pain: Report of four cases. *Pain Pract* 2020; 20:568-570.
11. Saito T, Steinke H, Miyaki T, et al. Analysis of the posterior ramus of the lumbar spinal nerve: The structure of the posterior ramus of the spinal nerve. *Anesthesiology* 2013; 118:88-94.