

A Rare Case of Atypical Back Pain from Symptomatic Bertolotti's Syndrome Treated with Radiofrequency Ablation

Arvind Senthilkumar, MD; Harman Chopra, MD; Pranamya Suri, MD, Eric Muneio, DO; Akhil Chhatre, MD

Johns Hopkins University School of Medicine

Introduction

Bertolotti's Syndrome is a rare cause of chronic back pain caused by a congenital lumbosacral transitional vertebra defect (LSTV), with an incidence of LSTV projected to be between 4 and 36%.³ Typically, the spines of these patients are characterized by enlargement of the caudal lumbar vertebrae at the transverse process leading to fusion or abnormal articulation between the transverse processes and sacrum.

The initial management of Bertolotti's Syndrome is typically conservative, utilizing pharmacologic agents, activity modification and physical therapy. Epidural steroid injection at the level of the transitional articulation is considered second line and effective especially if presentations seem consistent with nerve root irritation.⁶ More invasive approaches include surgical resection, or "processtectomy" of the lumbosacral vertebra.¹ However, for patients in which surgery is contraindicated, there remains a relatively novel and effective therapy option: continuous radio frequency ablation (RFA).⁴ By using high-frequency alternating currents to induce coagulative necrosis along the borders of the pseudoarticulation points, RFA serves as another option for the management of Bertolotti's Syndrome.

Case Report

We present a case of an 18-year-old female with past medical history significant for L4/L5 lumbar disc herniation who presented with progressive lower back pain and activity intolerance. The patient is a high-level lacrosse/soccer player and initially presented with worsening axial low back pain, and significant activity intolerance. MRI of the lumbar spine at the time revealed L5-S1 sacralized segment with contralateral pseudoarthrosis, consistent with a Type IV Bertolotti's Syndrome. **(Figure 1)** The patient failed conservative treatment which included physical therapy and anti-inflammatory medications. The next step in her treatment was an L5-S1 steroid injection at the bilateral L5-S1 zygapophyseal joints. The reported short lived pain relief of 80% for several days. Next, the patient was cleared to undergo radiofrequency ablation along the borders of her L5/S1 pseudoarthrosis. Under fluoroscopic guidance, two sterile 18-gauge 100mm radiofrequency cannula were positioned bilaterally at point of the L5-S1 pseudoarticulation. **(Figure 3)**. She underwent bipolar radiofrequency ablation at 80 degrees C for 90 seconds. The procedure was well tolerated with no observed complications during post-operative

Results

MRI imaging **(Figure 1)** of the lumbar spine revealed apparent transitional vertebra with abnormal connection between L5 transverse process and sacrum along with lateral, left-sided L4/5 disc herniation. Given the clinical presentation and distinct radiologic findings, Type IV Bertolotti's Syndrome was diagnosed. The patient was referred to our interventional pain service and underwent a bilateral L5/S1 zygapophysial joint steroid injection, which resulted in 90% reduction in axial pain post procedure but was short lived. The patient was then cleared to proceed with bilateral L5-S1 radiofrequency ablation. The patient had substantial functional improvement reporting marked pain relief after the procedure and the ability to return to lacrosse at 40% capacity. Recommendations were made for concurrent physical therapy with close follow-up and patient was referred to neurosurgery for a surgical consultation in the event her pain worsens in the future

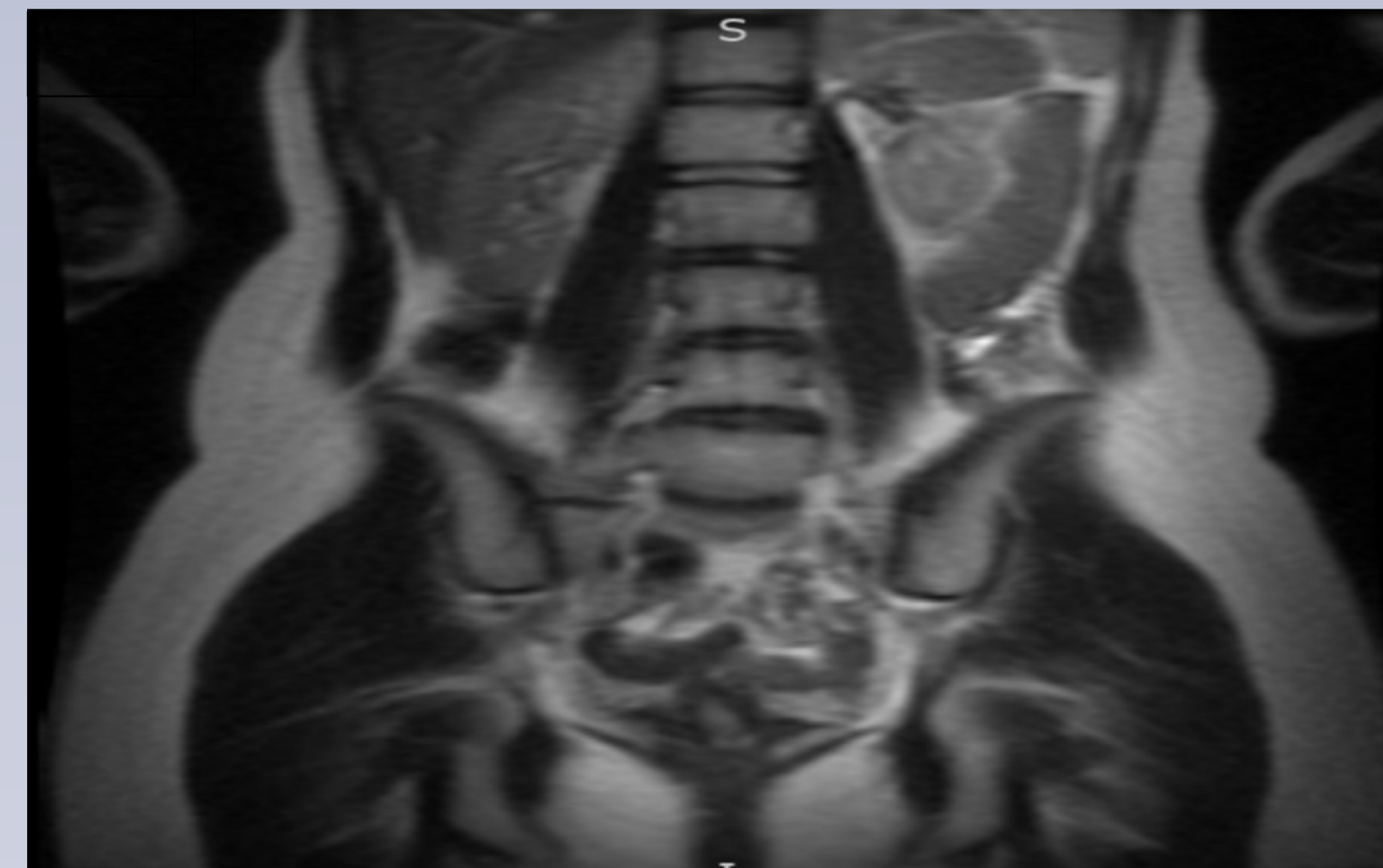


Figure 1: MRI images of lumbar spine revealing apparent transitional vertebra with abnormal connection between L5 transverse processes and sacrum

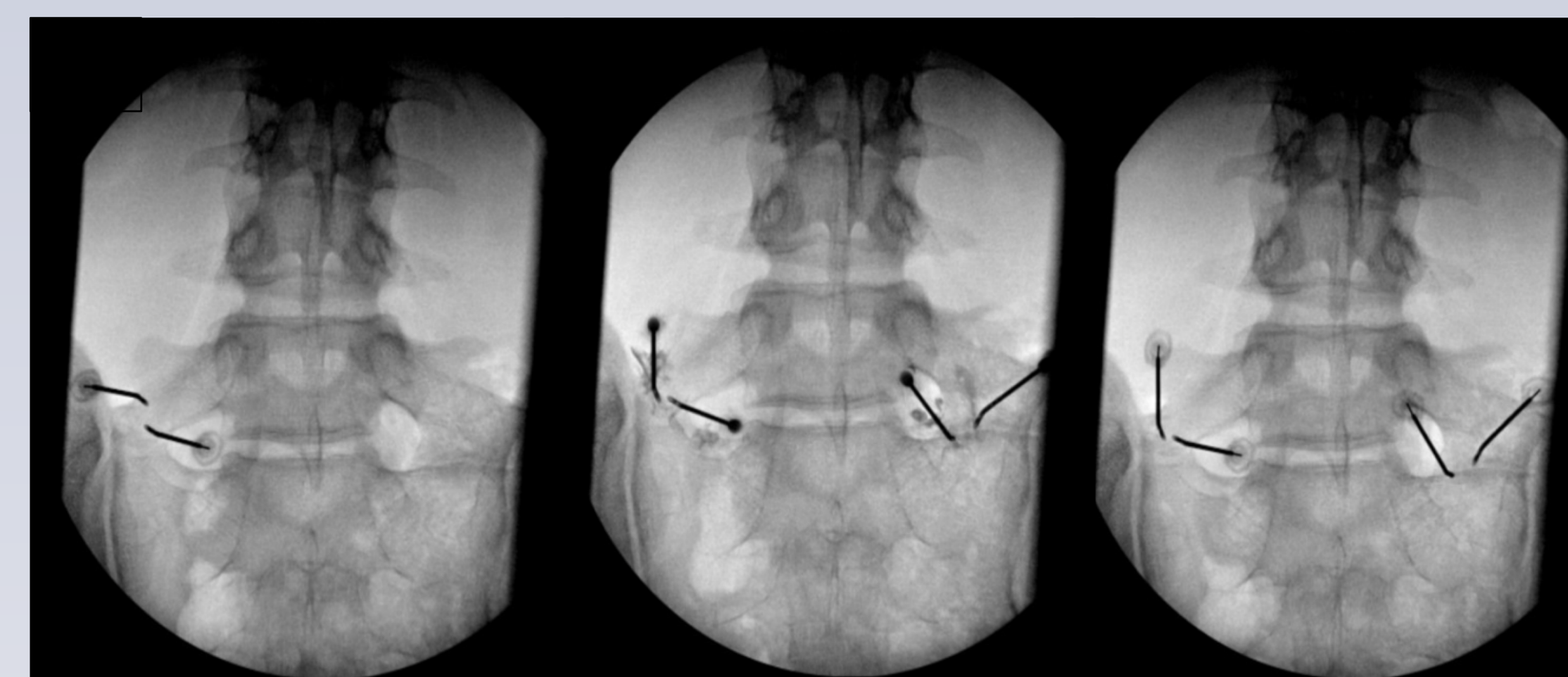


Figure 2: Series of images showing bilateral bipolar electrode placement at the point of pseudoarticulation and partial sacralization.

Discussion

Bertolotti's Syndrome is a lumbosacral transitional vertebrae (LSTV) defect that causes chronic low back pain. It is a rare but important diagnosis that should be considered in patients with lower back pain refractory to conservative measures. The presence of an LSTV disrupts the biomechanics of the spine and causes an imbalance in the mobility of the lower segments resulting sacroiliac joint dysfunction. Despite reports of mild improvement in outcomes, surgical intervention, whether it involves resection, "processtectomy", or fusion, is not recommended as first line treatment.

Neuromodulation, including continuous radiofrequency ablation (RFA), has become increasingly important in pain management. RFA uses a high frequency alternating current to create coagulative necrosis and neurotomy of the target nerve. The coagulative necrosis induced along the borders of the pseudoarticulation points appear to be the most efficacious targets while treating patients with Bertolotti's Syndrome. The use of two poles to deliver current in a bipolar RFA, creates a larger zone of ablation than monopolar RFA while using the same frequency, temperature and duration, making it advantageous for a neurotomy of a larger surface area such as when treating the pseudoarticulation points.¹⁰

This is a rare case of Bertolotti's Syndrome Type IV presenting as lower back pain in a young female athlete that failed conservative management and we demonstrate the use of RFA to adequately treat her pain and restore mobility. The procedure improved functional outcome in a young, high-performance athlete and allowed her to return to her sport with reduced capacity. RA may be an effective minimally-invasive alternative that can be offered to patients with symptomatic LSTV that fail conservative management, however, more data and randomized controlled trials are needed to compare RFAs against conservative *and* invasive surgical interventions such as "processtectomies".

References

- 1.Brault JS, Smith J, Currier BL. Partial lumbosacral transitional vertebra resection for contralateral facetogenic pain. Spine (Phila Pa 1976). Jan 15 2001;26(2):226-9. doi:10.1097/00007632-200101150-00020 PMID:11154546
- 2.Brenner AK. Use of lumbosacral region manipulation and therapeutic exercises for a patient with a lumbosacral transitional vertebra and low back pain. J Orthop Sports Phys Ther. Jun 2005;35(6):368-76. doi:10.2519/jospt.2005.35.6.368 PMID:16001908
- 3.Bron JL, van Royen BJ, Wuisman PI. The clinical significance of lumbosacral transitional anomalies. Acta Orthop Belg. Dec 2007;73(6):687-95. PMID: 18260478
- 4.Byrd D, Mackey S. Pulsed radiofrequency for chronic pain. Curr Pain Headache Rep. Jan 2008;12(1):37-41. doi:10.1007/s11916-008-0008-3 PMID: 18417022
- 5.Castellvi AE, Goldstein LA, Chan DP. Lumbosacral transitional vertebrae and their relationship with lumbar extradural defects. Spine (Phila Pa 1976). Jul-Aug 1984;9(5):493-5. doi:10.1097/00007632-198407000-00014 PMID: 6495013