ECRONICON OPEN ACCESS

EC ORTHOPAEDICS
Case Report

Bertolotti's Syndrome: An Overlooked Cause of Chronic Low Back Pain

Ismail Neftah*, Ouiam Taibi, Fariss Dehayni, Nidal El Hassani, Ahmed Ebedda, Laila Jrondi and Omar El Aoufir

Department of Radiology, University of Mohammed V, Rabat, Morocco

***Corresponding Author:** Ismail Neftah, Department of Radiology, University of Mohammed V, Rabat, Morocco.

Received: September 01, 2025; **Published:** September 30, 2025

Abstract

Bertolotti's Syndrome is a rare but often underdiagnosed cause of chronic low back pain, resulting from a congenital lumbosacral transitional vertebra (LSTV). This anatomical variation, characterized by an abnormal articulation or fusion between the transverse process of L5 and the sacrum or ilium, can lead to mechanical stress, altered biomechanics, and secondary degenerative changes. Patients typically present with unilateral or bilateral low back pain, often resistant to conventional therapies. Diagnosis relies on imaging modalities such as X-ray, CT, and MRI, which reveal the bony anomaly and associated degenerative changes. Management includes conservative treatment with physical therapy, pain relief strategies, and, in refractory cases, surgical interventions.

Keywords: *Bertolotti's Syndrome; Lumbosacral Transitional Vertebra; Chronic Low Back Pain; Spinal Biomechanics; Transverse Process Resection*

Introduction

Bertolotti syndrome is a relatively rare but significant condition of the spine, characterized by the presence of a transverse mega-apophysis of the last lumbar vertebra articulating with the sacrum and/or iliac wing, associated with lumbar or gluteal pain.

Anatomy and pathophysiology

In a normal spine, there are five lumbar vertebrae, followed by the sacrum, composed of fused vertebrae. In Bertolotti syndrome, L5 may show structural abnormalities manifested by extra joints (pseudoarticulations) or partial bony fusion with the sacrum or iliac bone.

These anomalies can lead to biomechanical alterations, causing asymmetry in the load borne by the spine and adjacent intervertebral discs. This asymmetry can, in turn, lead to back pain and premature disc degeneration.

Symptoms

Symptoms of Bertolotti syndrome vary according to the severity of the anomaly and the individual. The most common include:

- Chronic low-back pain: Often localized to the affected vertebra and exacerbated by physical activity.
- Radicular pain: Pain radiating to the lower limbs, similar to sciatica, due to nerve compression.
- Restriction of movement: Abnormal fusion may limit spinal flexibility.

Clinical Case

We report the case of a 37-year-old woman with bilateral chronic low back pain, more marked on the left, mechanical in appearance, associated with a sensation of lumbar locking.

Clinical examination reveals pain on palpation in the lower back, with reduced range of motion.

This is a coronal section CT scan showing an enlarged left transverse process of L5 forming a pseudoarthrosis joint with the homolateral iliac wing, characteristic of Bertolotti syndrome.

On the contralateral side, the transverse process is broad and close to the pelvis, suggesting possible asymmetry of the syndrome (which is very frequent).

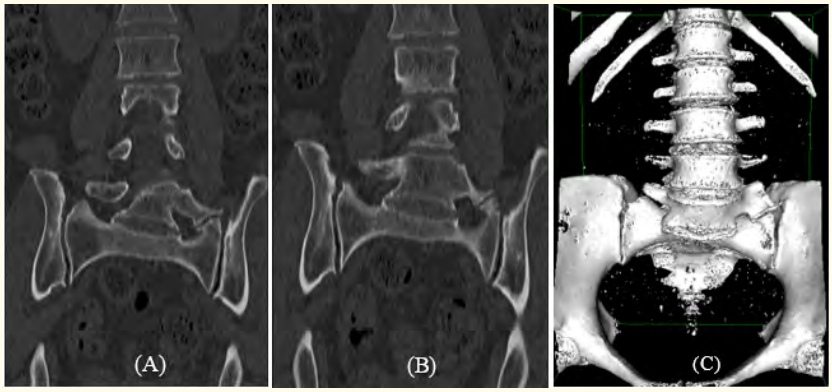

Figure: *Coronal section of bone reconstruction (A, B) and 3D reconstruction (C) from a lumbosacral CT scan showing fusion of the left transverse process of L5 with the sacrum.*

Diagnosis

The diagnosis of Bertolotti syndrome is based on a combination of clinical examination and medical imaging:

- **X-rays**: Standard X-rays may reveal fusion or pseudoarticulation of the L5 vertebra with the sacrum or ilium.
- **Computed tomography (CT scan):** Allows detailed visualization of bone structures and joint morphology.
- **MRI**: Useful for assessing soft tissue and nerve structures, as well as disc degeneration.

Treatment

Treatment of Bertolotti syndrome varies according to the severity of symptoms and their impact on the patient's quality of life.

Options include:

- **Conservative treatment:**

- Physiotherapy: To strengthen back muscles and improve flexibility.
- Medication: Non-steroidal anti-inflammatory drugs (NSAIDs), analgesics and sometimes corticosteroids to reduce pain and inflammation.
- Epidural steroid injections: To relieve radicular pain.

- **Surgical treatment:**

- Pseudoarticulation resection: If pain is caused by symptomatic pseudoarticulation.
- Spinal fusion: to stabilize the spine and relieve pain.

Prognosis

The prognosis of Bertolotti syndrome is variable. Many patients respond well to conservative treatments and can manage their symptoms successfully. However, some may require surgical intervention for lasting relief.

Discussion

Bertolotti syndrome is a complex condition that requires appropriate assessment and management to improve patients' quality of life. A thorough understanding of this spinal anomaly and a personalized therapeutic approach are crucial to effectively treating this syndrome and alleviating the resulting chronic pain.

Complications

Bertolotti syndrome can lead to several complications, especially if the condition is not diagnosed and treated appropriately. Here are the main complications associated with this syndrome:

1. Chronic low-back pain: It can become disabling and affect patients' quality of life.
2. Sciatica and radiculopathy: Nerve compression due to pseudoarticulation or abnormal fusion can lead to sciatica symptoms, such as pain, numbness and weakness in the legs.
3. Premature disc degeneration: Asymmetrical loading on the intervertebral discs adjacent to the transition vertebra can accelerate their degeneration.
4. Vertebral instability: The presence of a transitional vertebra and the biomechanical alterations can contribute to vertebral instability.
5. Osteoarthritis of facet joints: Due tu changes in the load and mechanics of the spine
6. Spinal deformity: In some cases, Bertolotti syndrome can lead to progressive spinal deformity, such as scoliosis.
7. Impact on quality of life: The chronic pain and functional limitations associated with Bertolotti syndrome can have a significant impact on patients' quality of life.
8. Surgical complications: In cases where surgery is required, complications may arise, such as infection, bleeding, non-fusion (pseudarthrosis) or damage to nerve structures.

Complication management

Managing the complications associated with Bertolotti syndrome often requires a multidisciplinary approach:

- Regular medical follow-up
- Physical therapy
- Pain management
- Surgical interventions.

Differential diagnosis of Bertolotti syndrome

Bertolotti syndrome can lead to chronic low-back pain. However, symptoms of the syndrome may overlap with several other musculoskeletal, neurological and visceral conditions.

1. **Common mechanical low back pain**: Absence of specific anatomical abnormality on X-rays or MRI.
2. **Facet joint syndrome**: Imaging shows signs of arthrosis or hypertrophy of the facet joints.
3. **Lumbar disc herniation**: MRI shows disc protrusion or extrusion with nerve root compression.
4. **Spondylolisthesis**: X-ray shows slippage of one vertebra in relation to another.
5. **Sacroiliitis**: Inflammation of the sacroiliac joint visible on MRI (effusion, bone oedema).
6. **Piriformis syndrome**: No bone or joint abnormality on imaging.
7. **Degenerative disc pathologies**: Absence of pseudoarticulation or transitional vertebra.
8. **Thoracolumbar hinge syndrome**: Anomaly at the thoracolumbar junction.
9. **Referred visceral pathologies**: Non-musculoskeletal origin. Renal, Gynaecological, Digestive.
10. **Psychosomatic disorders or fibromyalgia**: Diffuse, non-localized pain, often associated with other symptoms.

Conclusion

Bertolotti syndrome can lead to a number of complications, ranging from chronic pain to more severe spinal deformities. Early management and an appropriate therapeutic approach are essential to minimize these complications and improve the quality of life of patients with this condition [1-12].

Ethics Approval

Our institution does not require ethical approval for reporting individual cases.

Patient Consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

Bibliography

1. JF Quinlan., *et al*. "Bertolotti's syndrome. A cause of back pain in young people". *Journal of Bone and Joint Surgery: British Volume* 88.9 (2006): 1183-1186.
2. JM Jancuska., *et al*. "A review of symptomatic lumbosacral transitional vertebrae: Bertolotti's syndrome". *International Journal of Spine Surgery* 9 (2015): 42.
3. AT Malik., *et al*. "Posterior lumbar fusions at physician-owned hospitals- Is it time to reconsider the restrictions of the affordable care act?" *The Spine Journal* 19.9 (2019): 1566-1572.
4. AE Miller., *et al*. "Bertolotti syndrome". StatPearls (2023).
5. MS Moreno García., *et al*. "Síndrome de Bertolotti: a propósito de un caso". *Revista Colombiana de Reumatologia* (2016).
6. H Hachimi., *et al*. "Syndrome de Bertolotti". *Rev Maroc Radiol* (2012).

7. Alonzo F., *et al*. "Bertolotti's syndrome: an underdiagnosed cause for lower back pain". *Journal of Surgical Case Reports* 10 (2018): rjy276.

8. Nardo L., *et al*. "Lumbosacral transitional vertebrae: association with low back pain". *Radiology* 265.2 (2012): 497-503.

9. Nojiri H., *et al*. "Lumbosacral transitional vertebrae torsional biomechanics". *The Spine Journal* 14.11 (2014): S18.

10. Mahato NK. "Pedicular anatomy of the first sacral segment in transitional variations of the lumbo-sacral junction". *Spine* 36.18 (2011): E1187-E1192.

11. Neelakantan S., *et al*. "Multimodality imaging in Bertolotti's syndrome: an important cause of low back pain in young adults". *BMJ Case Reports* (2016): bcr2016217121.

12. Jain A., *et al*. "Bertolotti syndrome: a diagnostic and management dilemma for pain physicians". *Korean Journal of Pain* 26.4 (2013): 368-373.

Volume 16 Issue 5 May 2025