



# Type IIa Bertolotti's Syndrome as a Source of New Onset Lower Back Pain: A Case Report

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## Case History

49 year old left-handed female with 4 months of intermittent, sharp, moderate to severe radicular pain from the left lower lumbar region to the left posterior lower limb (sparing the foot). Her symptoms improved with standing and worsened with sitting and walking. She denied any numbness, tingling, trauma, previous surgeries, or red flag symptoms. Prior treatment attempts included a course of oral steroids terminated early due to rash and two sessions of physical therapy that she did not find helpful.

## Physical Examination

**Gait:** Ambulating without assistant device, non-antalgic gait, easy/smooth transfers, heel/toe walk without difficulty

**Alignment:** In quiet stance, is neutral and symmetrical with front-facing patellae, and normal hindfoot and forefoot alignment.

**Strength:** Pain-limited left hip flexion (4+/5), otherwise 5/5

**Sensation:** Intact to light touch throughout bilateral lower limbs

**Reflexes:** Patellar and Achilles reflexes 2/4 and symmetric, normal tone, down-going Babinski responses

### Focused Back Exam:

- Palpation: Tenderness over the left lumbar paraspinal muscles and left sacroiliac joint
- Range of Motion: Decreased and painful with flexion, otherwise full and painful in all remaining planes
- Special Testing: Positive left straight leg raise, seated slump, Kemp's focal facet loading, Kemp's radicular pain, and FABER radicular pain



## Final Diagnosis

Type IIa Bertolotti's Syndrome leading to lumbosacral facet arthropathy, left SI joint arthritis, and left L5-S1 radiculitis without evidence of myelopathy

## Discussion

Bertolotti's Syndrome refers to the presence of a lumbosacral transitional vertebra (LSTV), which is a total or partial fusion of the transverse process of the lowest lumbar vertebra to the sacrum. Although the exact incidence is unknown and likely underreported, it is thought to affect at least 4-8% of the population.<sup>1</sup> Four major etiologies may contribute to pain onset: (1) disc, spinal canal, and posterior element hypermobility above the level of the LSTV; (2) degeneration of anomalous articulation between LSTV and S1; (3) facet joint arthropathy contralateral to the fusion/articulation; and (4) extraforaminal stenosis secondary to broad transverse process.<sup>2</sup> Diagnosis is based on clinical presentation alongside imaging studies, with Ferguson radiographs (AP w/ 30° cranial angulation) having the highest sensitivity.<sup>3</sup> The Castellvi radiographic classification system of sacralization is used to further categorize Bertolotti's Syndrome into five major types as seen in figure C.<sup>3</sup> Given the varied presentation and multifactorial etiology of associated pain, treatment should be individualized for each patient. This often involves a combination of medications, physical therapy, and sometimes localized steroid injections under fluoroscopy (at the point of the pseudoarticulation and an additional transforaminal injection in patients with radicular involvement).<sup>3</sup> Surgical referral may be necessary for patients with persistent pain.

In this case, the patient's symptoms, physical exam, and imaging findings correlate to reveal arthritic pain (SI joint tenderness, +Kemps facet loading test) at the left-sided transverse process-sacroal pseudoarthrosis and radicular pain (radiating pain in S1 distribution, +straight leg raise, +seated slump) likely secondary to extraforaminal stenosis. In patients with no previous spine or musculoskeletal history, the gradual development of arthritis, facet arthropathy of neighboring vertebral levels and/or the contralateral side, and radicular pain seen with Type IIa Bertolotti's Syndrome can be an insidious and sometimes overlooked generator of low back pain and radicular symptoms. Increased age and the associated deterioration of core strength and decreased flexibility can then unveil pelvic instability. Thus, although a congenital condition, patients are usually asymptomatic until their late twenties or early thirties.<sup>2</sup> These factors coupled with the lumbosacral abnormalities seen in Bertolotti's Syndrome can predispose patients to arthritic and radicular pain and should be included in the differential.

## Differential Diagnosis

- 1) Lumbosacral radiculopathy
- 2) Lumbosacral facet joint arthropathy
- 3) Sacroiliac joint arthritis
- 4) Psoas syndrome

## Tests & Results

- Lumbar Spine X-ray, Frontal (A) and lateral (B):
  - Transitional lumbosacral anatomy consistent with a diagnosis of Type IIa Bertolotti's Syndrome (enlarged left transverse process with unilateral pseudoarthrosis with sacral ala)
  - Preservation of lumbar lordosis, vertebral body and disc space. No acute fracture or traumatic listhesis.
- Electrodiagnostic studies were unremarkable and revealed no evidence of radiculopathy

## Management

- Referral to Physical Therapy for individualized therapy
  - Focus on mobilization, neural stretching, core strengthening exercises, proximal lower extremity flexibility, and lumbosacral stabilization
- Activity modifications to avoid lumbar spine strain
- Pain relief with oral NSAIDs
- Future treatment considerations:
  - Sacroiliac vs epidural corticosteroid injection under fluoroscopy
  - Repeat electrodiagnostic studies if symptoms progress to overt numbness or any sustained weakness.
  - Surgical intervention as a last resort if all conservative methods fail

Castellvi's classification			
Type	Description	Anatomic features	Example
Type I	Displastic transverse process	Unilateral (a) or bilateral (b) large transverse process (>19 mm wide).	 Type 1a
Type II	Incomplete lumbarization/sacralization	Enlarged transverse process, with unilateral (a) or bilateral (b) pseudoarthrosis with the sacral ala.	 Type IIa
Type III	Complete lumbarization/sacralization	Enlarged transverse process, with unilateral (a) or bilateral (b) complete fusion with the sacral ala.	 Type IIIa
Type IV	Mixed	Type IIa on one side and type IIIa on the other	 Type IV

**C**

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## References

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