

Bertolotti's Syndrome

Inservice by Emma Edge, SPT
6/13/2023

What is Bertolotti's Syndrome?

- **Bertolotti's Syndrome definition:** congenital condition that involves a lumbosacral transitional vertebrae (LSTV) - typically at L5/S1
 - Most common: articulation between enlarged transverse processes of L5 with the sacrum
 - The transverse processes are enlarged in order to make up for the lost surface area due to the fused sacrum to allow for proper distribution of weight (leads to decreased motion at L5/S1)
- **Incidence:** incidence of a transitional vertebrae is between 4 and 36%, Incidence of Bertolotti's syndrome is between 4 and 8%
- **Etiology:** may have a genetic component - mutations in HOX10/HOX11 genes; may also be due to biomechanical factors (how the patient's weight is distributed over the SIJ or an abnormal/underdeveloped iliolumbar ligament)
- **Population:** symptoms typically present in the patient's early 20's but it is a congenital condition that is present from birth

Spinal Anatomy & Differences with Bertolotti's Syndrome:

Typically developed lumbosacral spine:



Spine with Bertolotti's:



Types of Bertolotti's Syndrome:

Ia: unilateral, enlarged transverse process

Ib: bilateral, enlarged transverse processes

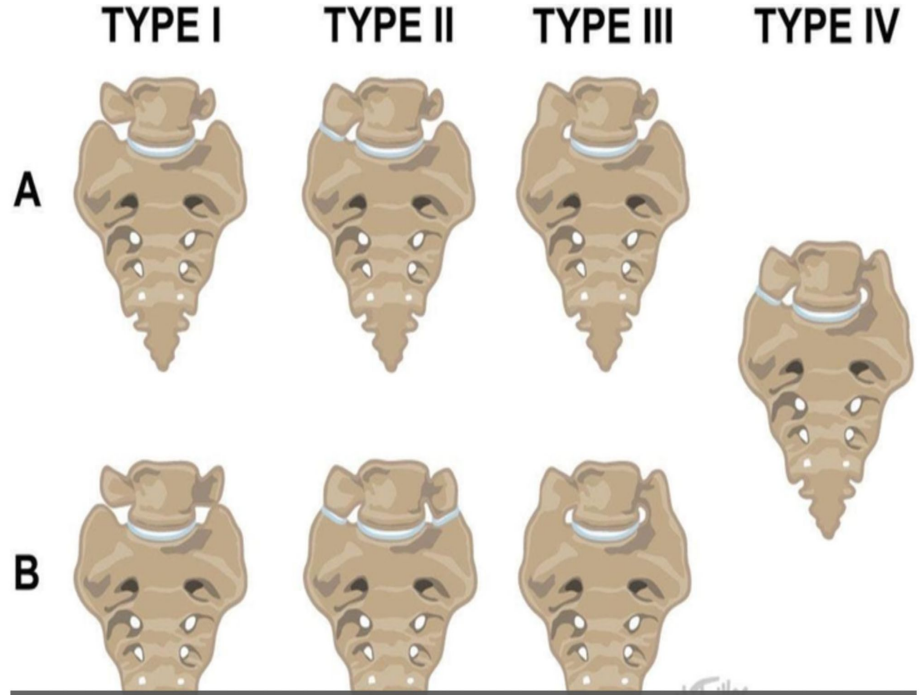
IIa. unilateral pseudoarticulation of transverse process w/ sacrum

IIb. bilateral pseudoarticulation of transverse processes w/ sacrum

IIIa. unilateral fusion of transverse process & sacrum

IIIb. bilateral fusion of transverse process & sacrum

IV. type IIa on one side and IIIa on contralateral side



How to Officially Diagnose Bertolotti's Syndrome:

Who can officially diagnose: spine specialists, general physicians, orthopedists, etc. (aka...not us)

How it is diagnosed: CT (usually first line of action), MRI or X-ray

CT:



MRI:



PT Evaluation for Bertolotti's Syndrome:

- **Common pain patterns:** nonspecific TTP in general lumbosacral region, may have radiating sciatic pain, may have lack of spinal ROM
- **Subjective questions to rule in/out:** specific MOI, history of spinal injury, age, occupation, aggs/eases of the pain, change in bowel/bladder, onset of pain (acute or chronic)
- **Testing to rule in/out:**
 - Myotomes: Great toe Flex/Ext, Dermatomes: back of the leg into foot (sciatic pain), Deep Tendon Reflex: Achilles Tendon, Palpation/joint mobs to assess joint mobility, hip/glute muscle testing, SIJ provocation testing
- **Other explanations for pain other than Bertolotti's:** DDD, muscular strain, disc herniation, spondylosis, lumbar radiculopathy, scoliosis

Surgical Interventions/Non-PT Treatments for Bertolotti's:

- Radiofrequency Ablation
- *Steroid Injections/Epidural Injections
- Spinal Fusion
- Spinal Decompression
- Segment Removal
- *NSAIDs

Conservative/PT Treatment for Bertolotti's:

Modalities:

- E-stim
- Ultrasound
- Heat/Cold
- Dry Needling
- Cupping
- Massage

Therapeutic Exercise:

- Core Strengthening & Stabilization
- Glute/Hip/LE Strengthening
- Functional strengthening for ADLs
- ROM Maintenance
 - Spinal & Muscular

Key Takeaways:

- 1. Rule out all other sources of LBP before assuming the problem is structural.**
 - 2. Know when to refer out & have quality resources to refer patients to.**
 - 3. Create a treatment program to maintain patient function and quality of life between treatments or before/after surgical interventions.**
-

Resources:

- Miller AE, Zhang A. Bertolotti Syndrome. [Updated 2022 Jul 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK585032/>
- Crane J, Cragon R, O'Neill J, Berger AA, Kassem H, Sherman WF, Paladini A, Varrassi G, Odisho AS, Miriyala S, Kaye AD. A Comprehensive Update of the Treatment and Management of Bertolotti's Syndrome: A Best Practices Review. *Orthop Rev (Pavia)*. 2021 Jun 22;13(2):24980. doi: 10.52965/001c.24980. PMID: 34745474; PMCID: PMC8567758.
- Dizdarevic I, Bishop M, Sgromolo N, Hammoud S, Atanda A Jr. Approach to the pediatric athlete with back pain: more than just the pars. *Phys Sportsmed*. 2015 Nov;43(4):421-31. doi: 10.1080/00913847.2015.1093668. Epub 2015 Oct 29. PMID: 26513167.
- Alonzo F, Cobar A, Cahueque M, Prieto JA. Bertolotti's syndrome: an underdiagnosed cause for lower back pain. *J Surg Case Rep*. 2018 Oct 17;2018(10):rjy276. doi: 10.1093/jscr/rjy276. PMID: 30356933; PMCID: PMC6191822.
- McGrath K, Schmidt E, Rabah N, Abubakr M, Steinmetz M. Clinical assessment and management of Bertolotti Syndrome: a review of the literature. *Spine J*. 2021 Aug;21(8):1286-1296. doi: 10.1016/j.spinee.2021.02.023. Epub 2021 Mar 3. PMID: 33676018.