



A Case Reports of Intra-Articular Steroid Injection in the Treatment of Bertolotti's Syndrome

Goh Teik Chiang^{1*}, Mohd Shahir Bin Anuar², Kamalnizat Bin Ibrahim¹, Azmi Bin Baharudin¹ and Mohd Hisam Bin Mohd Ariffin¹

¹Department of Orthopaedics and Traumatology, Hospital Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

²Department of Anaesthesia, Hospital Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

Authors' contributions

This work was carried out in collaboration between all authors. Author GTC designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors MSBA and KBI managed the analyses of the study. Authors ABB and MHBMA managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJORR/2018/44876

Editor(s):

(1) Dr. Ikem, Innocent Chiedu, Professor, Department of Orthopaedic Surgery and Traumatology, Obafemi Awolowo University, Ile-Ife, Nigeria.

Reviewers:

(1) Xing Wu, Shanghai Tenth People's Hospital, Tongji University, China.

(2) Vinotha Sanmugarajah, University of Jaffna, Sri Lanka.

Complete Peer review History: <http://www.sciencedomain.org/review-history/27109>

Case Study

Received 30th August 2018
Accepted 2nd November 2018
Published 8th November 2018

ABSTRACT

Bertolotti's Syndrome (BS) is defined as an association between low back pain (LBP) and the congenital malformation of the lumbosacral transitional vertebra (LSTV). There are several treatments have been proposed by literature including steroid injections, resections of the LSTV, laminectomy, and lumbar spinal fusion, however, there is no best treatment has been agreed. Researchers present three case reports diagnosed as BS in Malaysia age from 25 to 30 years with chronic low back pain extending to the gluteal region and just above the ipsilateral sacroiliac joint. Radiographic investigation of these three patients revealed an anomalous enlargement of the left, right and bilateral transverse process of the fifth lumbar (L5) vertebra forming a pseudoarthrosis with the infra adjacent ala of the sacrum. These cases were managed successfully with fluoroscopically guided intra-articular steroid injection with local anaesthetic over the transverse process with ilium articulation and asymptomatic for 6 months on follow up. This case report denoted that a simple non-surgical management for treating symptomatic lumbosacral junction pseudo-articulation that warrants a better mode of management.

*Corresponding author: Email: teikchianggoh@hotmail.com;

Keywords: Bertolotti's syndrome; intraarticular steroid injection; pseudoarticulation.

1. INTRODUCTION

Bertolotti's Syndrome (BS) was first described in 1917 by the syndrome was associated with axial low back pain (LBP) secondary to arthritic changes. The overall incidence of Bertolotti's syndrome has been reported to be between 4% to 21% in patients with low back pain [1,2]. Recently, high incidence has been reported which increased to 30% [3,4]. The causes of LBP in BS are multifactorial [5]. The abnormal mechanical stress and muscles strain may lead to facet joint arthropathy. The enlarged fan-shaped transverse foramina may cause nerve root compression due to narrowing of the intervertebral foramina and leading to neurogenic claudication later. An increased prevalence of disc protrusion or extrusion in the disc above the transitional L5 vertebra also has been found in patients with BS. To date, there has been no known effective non-surgical management options described [1]. The pain generator in the syndrome has also not been identified because such an anatomical variation produces or not low back pain and/or sciatica is a subject of great debate [3,4]. Researchers present three case reports of a patient with symptomatic BS managed successfully with fluoroscopically guided steroid injection of the transverse process with ilium articulation.

2. CASE REPORT

1) A 25 years old female was evaluated for chronic LBP associated with both medial thigh cramping. She was treated with nonsteroidal antiinflammatory medications. The patient's pain was located in the low back, with radiation to the buttocks and anterolateral thighs. Provocative factors included forward flexion of her back. The pain was not affected by prolonged sitting or standing. The quality of the pain was described as burning and sharp. The pain intensity on a Visual Analogue Scale (VAS) was scored 5/10. On physical examination the patient's bilateral lower extremities strength is full. The sensation was intact from L2 to S2. On palpation, there was focal tenderness along the base of the bilateral lumbosacral spine and around the posterior-superior iliac spine. Radiographs of the lumbar spine revealed an abnormal articulation between the L5 transverse process and the medial aspect of the ilium bilaterally, consistent with Bertolotti's syndrome (Fig. 1).

2) A 28 years old male presented for left LBP. He was on analgesics for the last 3 weeks. His symptoms began 2 years exaggerated by certain movements mainly while bending forward. Physical examination demonstrated tenderness over the lumbar spine and left sacrum, VAS scored 6/10. Laseque sign was negative on bilaterally. Otherwise, both lower limbs were normal. The radiographs showed a typical lumbosacral transitional vertebra (LSTV), with an extensive left transverse process of the fifth lumbar vertebra, articulating with the ala of the sacrum (Fig. 2).

3) A 30 years old male presented with right LBP increases with the trunk flexion and occasionally radiates to the right lower limb until the knee. Her Oswestry score was 40% indicating moderate disability. The rest of the clinical examination is normal. The radiograph of the spine shows an alteration in the LSTV with a sacral lumbarisation and pronounced right transverse processes of L5 (Fig. 3).

All three patient's clinical examination and radiographs were consistent with the articulation between the traverse process and ilium as a possible source of pain, the researcher decided to inject local anaesthetic and corticosteroid into the transverse process with ilium articulation region. Researcher used a 3-1/2 inch 22-gauge spinal needle inserted into the articulation between the transverse process and ilium guided by Philips c-arm fluoroscopy, 0.5 mL of Iohexol 240 mg/ml contrast dye was injected once the needle tip was felt and slip into the joint with evidence of arthrogram and superior spread is seen (Fig. 4). A solution containing 1 ml of ropivacaine 0.75% and 40 mg of triamcinolone acetate was injected on the affected side. During the first month of follow-up in the clinic, the patient's VAS decreased from 6/10 to 3/10, and their Oswestry score decreased from 40% to 20%. All patients had no symptoms after 6 months of follow up.

3. DISCUSSION

The aetiology of pain in symptomatic cases of Bertolotti's syndrome (BS) is unknown, and the association of BS with low back pain (LBP) is unclear [1]. A possible aetiology for pain includes the articulation of the transverse process and ilium and resulting degenerative changes [6]. Secondly, the fused transitional vertebrae may

result in instability above the level of the fusion and third explanation may be because BS is not associated with back pain at all [1] while Wigh et al. [7] and Castellvi et al. [8] found that in patients



Fig. 1. Bilateral L5 transverse process articulation with medial aspect of the ilium

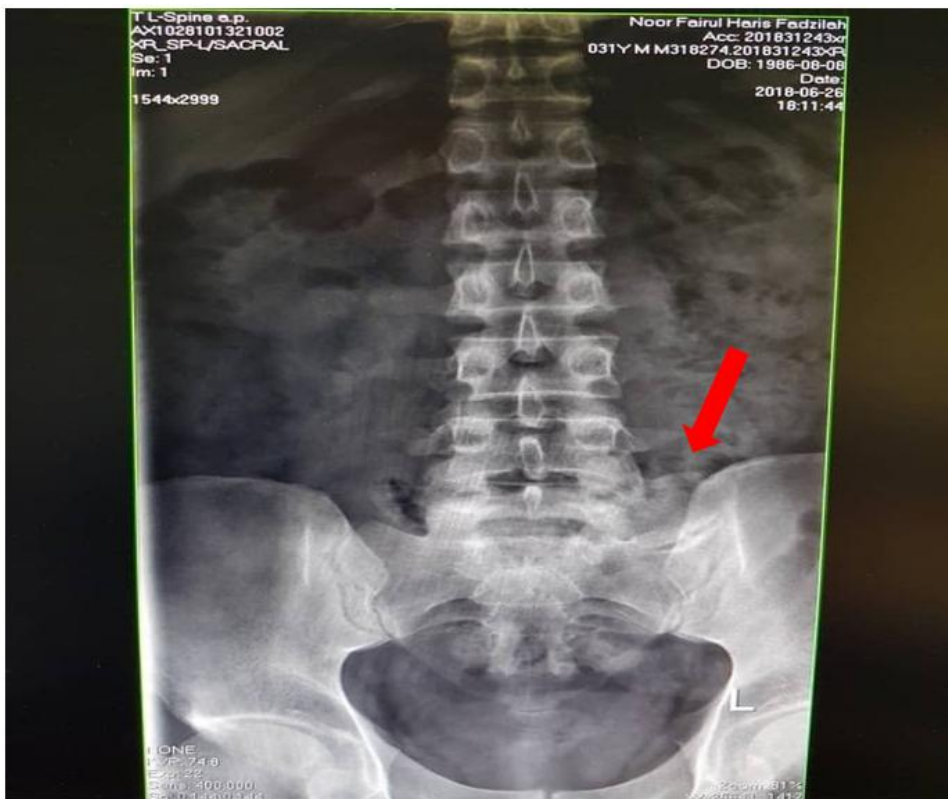


Fig. 2. Large left transverse process of fifth lumbar vertebra



Fig. 3. Right large lumbosacral transitional vertebra with sacral lumbarisation

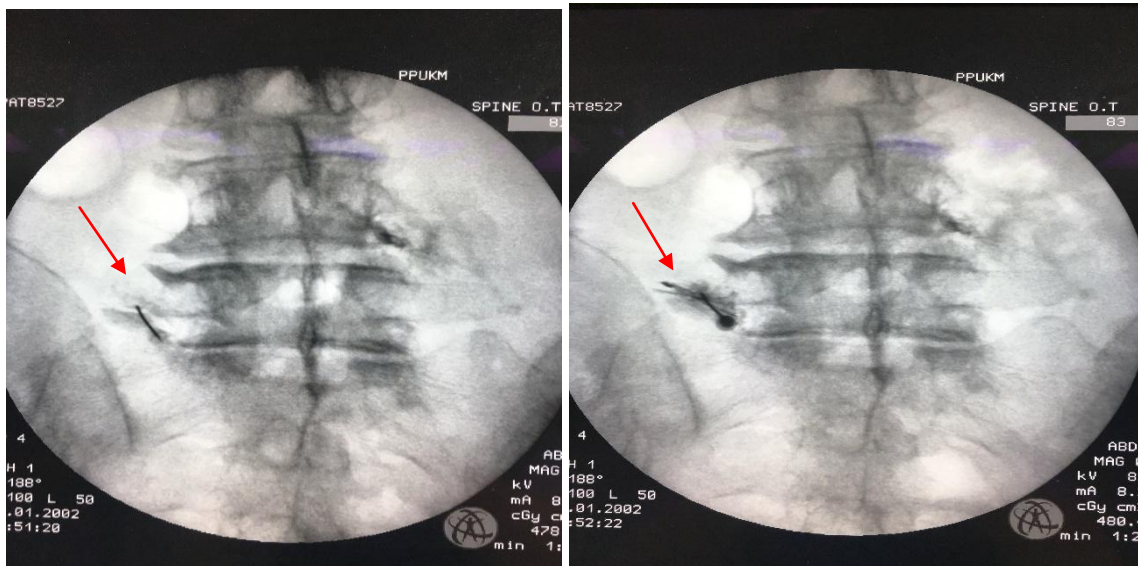


Fig. 4. Showed spinal needle inserted and a contrast dye injected into the articulation between the transverse process and ilium of right LSTV guided by the image intensifier

with back pain and sciatica, the transitional vertebra had a prevalence of 21% and 30% respectively [8,7,4]. Quinlan et al. reported a higher incidence of low back pain in the younger

patient population with BS as all the cases reported are young patients [9]. Elster et al. found that the incidence of degenerative disc disease and spinal stenosis was nearly nine

times higher in the level adjacent to the to the transitional vertebrae, suggesting that there may be abnormal biomechanical stress above the fusion [10].

Therapeutic options for symptomatic cases of Bertolotti's syndrome include conservative management and surgery [11]. To date, there is no agreement as to the best method of treatment for BS patients. However, researchers are discussing regarding intraarticular steroid injection as a treatment of choice for our patients as they refused any surgical intervention after failed conservative management such as pain relief medications and physiotherapy.

There are few kinds of literature reviewed regarding intraarticular steroid injection for BS. Marks et al. followed prospectively a cohort of ten patients with BS on X-ray [12,2]. Eight patients had immediate total relief of pain and one patient had total pain relief within the first week after steroid injection [2]. Three patients reported adequately partial relief of pain after periods of six months [2] and one patient remained pain for free two years after the intervention. A study by Avimadje et al., twelve patients with LSTV reported LBP or buttock-pain on same side [13,2]. Seven of eight patients improved or had no symptoms after six months to two years after injection [13,2]. Jain et al. prospectively reported twenty patients with BS and two patients were treated with steroid injections after a diagnostic block given however none of the patients experienced pain relief at the end of the 6-month study period [5,2].

Some of the studies describing treatment with steroid injections [5,14] were case reports [15,14,16] or studies, where the patients refused surgery after selective nerve root block [14,17,2]. Unfortunately, there was no follow-up. Two cases have been reported on patients with LSTV articulation with the existing root of foramen causing impingement of the L5 nerve root [14,17,2]. The patients received a nerve root block with steroid and local anaesthetics and pain relieved immediately [2]. They had no radiculopathy for two months and a repeat nerve root block was performed [17]. This study does not mention any subsequent clinical outcome after following up [18,2].

4. CONCLUSION

The association between a BS and LBP is still unclear despite a high prevalence [2] however

high incidence in younger age group was reported [15]. The literature regarding the local administration of steroid injection and surgical management is scattered and very few studies have investigated the treatment of BS [18,2,4]. Present case studies suggest that a simple steroid injection into the articulation between the transverse process and ilium may offer a simple initial diagnostic and therapeutic in the management of symptomatic BS. However further studies with larger sample sizes and longer follow-up periods are needed for this type of treatment.

CONSENT

As per international standard or university standard, the patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ricardo Vallejo. Bertolotti's syndrome: A case report. *Pain Practice*. 2009;9(2):152–154.
2. Emil Kongsted Holm, Cody Bünger, Casper Bindzus Foldagerb. Symptomatic lumbosacral transitional vertebra: A review of the current literature and clinical outcomes following steroid injection or surgical intervention. *SICOT J*. 2017;3:71.
3. Paraskevas G, Tzaveas A, Koutras G, Natsis K. Lumbosacral transitional vertebra causing Bertolotti's syndrome: A case report and review of the literature. *Cases J*. 2009;2:8320.
4. Georgios Paraskevas, Alexandros Tzaveas, Georgios Koutras, Konstantinos Natsis. Lumbosacral transitional vertebra causing Bertolotti's syndrome: A case report and review of the literature. *Cases J*. 2009;2:8320.
5. Jain A, Agarwal A, Jain S, Shamsheery C. Bertolotti syndrome: A diagnostic and management dilemma for pain physicians. *Korean J Pain*. 2013;26:368–373.
6. Manmohan S, Dzulkarnain A, Nor Azlin ZA, Fazir M. Bertolotti's syndrome: A commonly missed cause of back pain in

- young patients. *Malays Fam Physician*. 2015;10(2):55–58.
7. Wigh RE, Anthony HF. Transitional lumbosacral discs: Probability of herniation. *Spine*. 1981;6:168-171.
 8. Castellvi AE, Goldstein LA, Chan DP. Lumbosacral transitional vertebrae and their relationship with lumbar extradural defects. *Spine (Phila Pa 1976)*. 1984;9, 493–495.
 9. Quinlan JF, Duke D, Eustace S. Bertolotti's syndrome. A cause of back pain in young people. *J Bone Jt Surg Br*. 2006;88:1183–1186.
 10. Elster AD. Bertolotti's syndrome revisited. Transitional vertebrae of the lumbar spine. *Spine*. 1989;14:1373-1377.
 11. Bertolotti M. Contributo alla conoscenza dei vizi di differenziazione regionale del rachide con speciale riguardo all assimilazione sacrale della v. lombare. *Radiol Med*. 1917;4:113–144.
 12. Marks RC, Thulbourne T. Infiltration of anomalous lumbosacral articulations. Steroid and anesthetic injections in 10 back-pain patients. *Acta Orthop Scand*. 1991;62:139–141.
 13. Avimadje M, Goupille P, Jeannou J, et al. Can an anomalous lumbo-sacral or lumbo-iliac articulation causes low back pain? A retrospective study of 12 cases. *Rev rhum (Engl Ed)*. 1999;66:35–39.
 14. Mitra R, Carlisle M. Bertolotti's syndrome: A case report. *Pain Pract* 2009;9:152–154.
 15. Santavirta S, Tallroth K, Ylinen P, Suoranta H. Surgical treatment of Bertolotti's syndrome. Follow-up of 16 patients. *Arch Orthop Trauma Surg* 1993;112:82–87.
 16. Mercader Rodriguez B, Sanchez RF, Domenech Abellan E, et al. Bertolotti syndrome: A little known cause of low-back pain in childhood. *J Pediatr*. 2015;166:202.
 17. Weber J, Ernestus RI. Transitional lumbosacral segment with unilateral transverse process anomaly (Castellvi type 2A) resulting in extraforaminal impingement of the spinal nerve: A pathoanatomical study of four specimens and report of two clinical cases. *Neurosurg Rev*. 2010;34:143–150.
 18. Holm EK, Bünker C, Foldager CB. Symptomatic lumbosacral transitional vertebra: A review of the current literature and clinical outcomes following steroid injection or surgical intervention. *SICOT-J*. 2017;3:71.

© 2018 Chiang et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sciencedomain.org/review-history/27109>