

Low Back Pain Secondary To Unilateral Facet Joint Hypoplasia In The Lumbosacral Junction

S Knoeller, T Bley

Citation

S Knoeller, T Bley. *Low Back Pain Secondary To Unilateral Facet Joint Hypoplasia In The Lumbosacral Junction*. The Internet Journal of Orthopedic Surgery. 2005 Volume 3 Number 2.

Abstract

Introduction: The authors' intention was to report the clinical, radiological, intra- and postoperative findings of a patient with low back pain and pseudoradicular pain radiation to the left leg. As reason, a considerable hypoplasia of the left inferior facet joint of L5 and dysplastic cranial facet joint of S1 was detected. To the authors' knowledge no case of facet joint dysplasia with ipsilateral pain has been reported so far.

Methods: Different forms of dysplasia or false orientation of the facet joints in the lumbosacral joints are described to cause low back pain. One case of recurrent low back pain with pseudoradicular radiation is reported. Medical and radiological reports and related literature were reviewed.

Results and Discussion: A 44 years old woman complained about recurrent low back pain consisting for 2 years. 4 weeks before admission to our clinic, a pseudoradicular leg pain on the left side occurred. Roentgenographic findings showed an aplasia of the left facet joint of L5/S1, MR tomography revealed disc degeneration in the lumbo-sacral junction. Computed tomography including 3D reconstruction showed a considerable hypoplasia of the left inferior articular facet L5. A possible reason for left-sided pseudoradicular leg pain, a dysplastic left sacral articular process was detected forming a sclerotic degenerated "pseudo-articulation" with the left hemilamina of L5. There was no pain relief after conservative treatment. Diagnostic investigations for instability including a probative chest tube and a facet infiltration of the facet joint on the left side were followed by complete pain relief. A spinal fusion in unilateral transforaminal posterior interbody fusion technique (PLIF) from the left side led to complete remission of back pain and pseudoradicular radiation.

Conclusions: Hypoplasia of the facet joint in the lumbosacral junction is extremely rare to cause back pain. If conservative treatment does not result in pain relief, spinal fusion may be indicated.

CASE REPORT

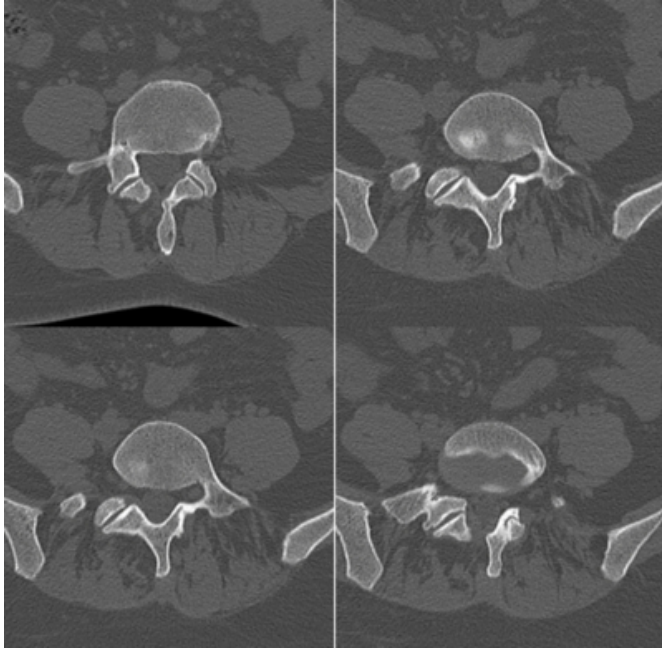
A 44 years old woman was evaluated with a five year history of recurrent low back pain radiating to the lateral left thigh. After initial onset of pain five years ago, radiating occurred recently. Plain radiography of the lumbar spine mislead to the diagnosis of left facet joint aplasia at the lumbosacral junction. Non-surgical treatment including physiotherapy was recommended. Two months later, lumbar pain suddenly increased as well as radiation to the left thigh. The patient was treated conservatively while in hospital. Her pain decreased, however, after discharge increased again. At admission to our department, mobility of the lumbar spine was restricted. The straight leg raising (SLR) test was negative, no neurologic disturbance was noted, and radiation was pseudoradicular. There was also pain on pressure at the

lumbosacral junction.

Computed tomography showed considerable hypoplasia of the left articular facet joint of L5, and a dysplastic left superior sacral articular process. Normally, the superior sacral articular process is standing anteriorly of the inferior articular facet of L5. In this case, the dysplastic left sacral process was missing its counterpart, and was standing posteriorly of the left hemilamina of L5 forming a "pseudo-articulation". Pronounced degenerative sclerosis was found, spondylolisthesis could not be detected. In the joining articular facets of L5/S1 (Fig 1A-D), subchondral sclerosis as a sign of degenerative change was found on the right.

Figure 1

Figure 1a-d: Regular facet joints of vertebra L4/5, the superior facet L5 stands anterior of the inferior facet L4 (A). Distinct hypoplastic left inferior facet L5, slight degenerative changes within the right facet joint (B, C). Please note (arrow) the dysplastic left superior sacral facet standing posterior of the left hemilamina L5 in a “pseudo-articulation”; pronounced degenerative sclerosis (D).



3-dimensional reconstruction facilitated to understand the patho-anatomical findings (Fig 2)

Figure 2

Figure 2: 3D-SSD reconstruction of computed tomography revealing aplasia of the left inferior facet L5 (arrow). The spinous process L5 stands lateral to the median sacral crest on the left side.

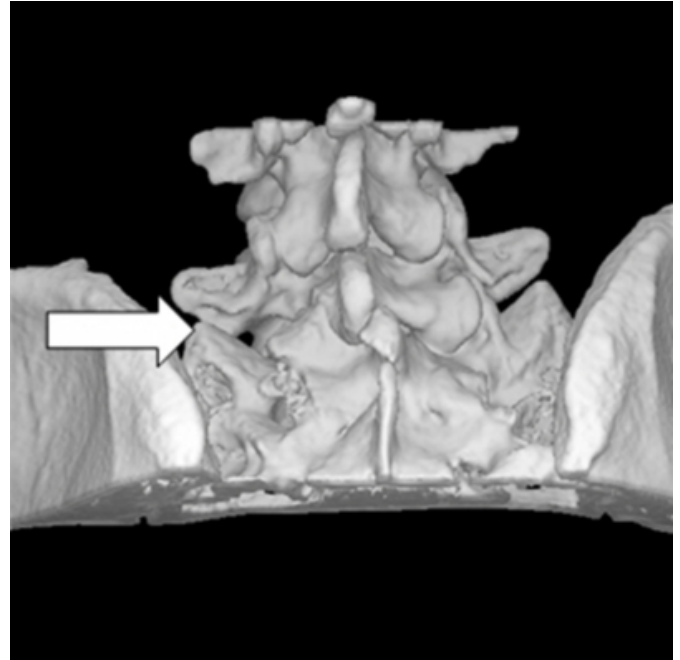


Figure 3

Figure 3: Plain lateral radiograph of the lumbosacral junction after fusion of L5/S1.



Because of frustrate conservative therapy diagnostic investigations for instability including a probative chest tube for one week and an anaesthetic infiltration of the hypoplastic left facet joint of L5/S1 were carried out. Probative chest tube was followed by an 80% pain relief. After infiltration of the left facet joint there was a complete pain relief for one hour as well for the low back pain as for the radiation to the thigh. Spinal fusion L5/S1 in unilateral posterior interbody fusion technique (PLIF) from the left

side was carried out [1]. Surgery was followed by a complete remission of back pain and pseudoradicular radiation. Two years follow up examination revealed no recurrence of the preexisting pain.

DISCUSSION

The development of degenerative instability in the lumbar spine is discussed controversially. Presence of a transitional vertebra as a reason for low back pain described by Bertolucci in 1917 is statistically unsure [2].

Reviewing 2000 plain radiographs, Elseter found transitional vertebra in 7% of his patients [3]. Tini et al. stated 4-6% in normal population. In their investigation no correlation of low back pain and transitional vertebra was found [4]. Castellvi found transitional vertebrae in 9 of 60 patients (15%) with herniated discs. Correlation of transitional vertebra and low back pain was positive [5].

Often low back pain is attributed to facet joint abnormalities. The coincidence of facet joint orientation and disc failure has been investigated by Fafan et al. [6]. They found an increase of facet joint forces in relationship of facet orientation leading to intervertebral disc failure.

Patients with sagittal facet joints are destined for degenerative spondylolisthesis and disc degeneration as stated by Dai and Sato [7, 8].

Luo et al. observed the roll of loads of facet joints in the aetiology of low back pain introducing an in vivo-model to measure facet joint loads [9].

Kornberg reported a case of unilateral facet joint dysplasia in combination with spondylolisthesis and contralateral facet joint degeneration [10]. In his case facet joint degeneration caused pain because of chronically increased interfacet forces. A posterolateral fusion of the lumbosacral junction was performed.

Brault also reported a case of mechanical low back pain in a 17-year-old cheerleader caused by a facet contralateral to a unilateral anomalous lumbosacral articulation. He reported excellent results after surgical treatment [11].

Regarding our case, low back pain can be interpreted as

beginning instability, pseudoradicular pain on the left as a result of the left hemilamina of L5 forming a degenerative" pseudo-articulation". Disc degeneration was seen, but no spondylolisthesis.

Even if disc degeneration or spondylolisthesis can be excluded in patients with recurrent low back pain, further examinations such as CT-scans are recommended to detect facet joint defects. If there is no pain relief after conservative treatment and if diagnostic investigations for instability are positive, spinal fusion of the affected segment can be indicated.

CORRESPONDENCE TO

Stephan M Knoeller, MD, Department of Orthopedic and Trauma Surgery, University Hospital Freiburg, Head: Norbert Suedkamp MD, PhD. Hugstetter Str. 55, D 79105 Freiburg, Germany. Tel.: 0049 761 2610. Fax.: 0049 761 270 2894. E-mail: stefan.knoeller@uniklinik-freiburg.de

References

1. Harms J.G., Jeszenszky D. Die posteriore, lumbale, interkorporelle Fusion in unilateraler transforaminaler Technik. *Operat Orthop Traumatol* 1998; 10: 90-102.
2. Bertolotti M. Contributo alla conoscenza di differenziazione regionale del rachide con speciale riguardo al assimilazione sacrale della V lombare. *Radiol Med* 1917; 4: 113-44.
3. Elster A.D. Bertolotti's syndrome revisited: transitional vertebrae of the lumbar spine. *Spine* 1989; 14: 1373-1377.
4. Tini P.G., Wieser C., Zinn W.M. The transitional vertebra of the lumbosacral spine: its radiological classification, incidence, prevalence and clinical significance. *Rheum Rehabil* 1977; 16: 180-185.
5. Castellvi A.E., Goldstein L.A., Chan D.B.K. Lumbosacral transitional vertebra and their relationship with lumbar extradural defects. *Spine* 1983; 9: 493-495.
6. Farfan H.F., Sullivan J.D. The relation of facet orientation to intervertebral disc failure. *Can J Surg* , 1967;10:179-185.
7. Dai L.Y. Orientation and tropism of lumbar facet joints in degenerative spondylolisthesis. *Int Orthopedics* 2001; 25: 40-42.
8. Sato K., Wakamatsu E., Yoshizumi A., Watanabe N., Irei O. The configuration of the laminae and facet joints in degenerative spondylolisthesis. A clinicoradiologic study. *Spine* 1989; 14: 1265-1271.
9. Luo Z.P., Buttermann G.R., Lewis J.L. Determination of spinal facet joint loads from extra articular strains-a theoretical validation. *J Biomechanics* 1996; 29: 785-790.
10. Kornberg M. Spondylolisthesis with unilateral pars interarticularis defect and contralateral facet joint degeneration. *Spine* 1988; 13: 712-713.
11. Brault J.S., Smith J., Currier, L. Partial lumbosacral transitional vertebra resection for contralateral facetogenetic pain. *Spine* 2001; 26: 226-229.

Author Information

Stefan M. Knoeller, M.D.

Department of Orthopaedic and Trauma Surgery, University Hospital Freiburg

Thorsten Bley, M.D., Ph.D.

Department of Radiology, University Hospital Freiburg