

TRAUMATIC BILATERAL PARS INTERARTICULAR FRACTURE IN PEDIATRIC AGE: AN EXEMPLARY CASE REPORT FROM SAUDI ARABIA

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Abstract

Bilateral pars interarticular fractures are uncommon among children. These fractures can be found in sport players. A case of male soccer player aged 12-year-old who had fallen on his back while playing the game was brought to the orthopedic clinic. He complained of moderate to severe back discomfort that had persisted for a week. His pain is intense, constant, made worse by movements that cause hyperextension, and it is lessened by rest and non-radiative analgesics. A neurologic assessment revealed no anomalous results. A physical examination revealed a normal gait and pelvic and spinal alignment. The paraspinal muscle region and the lumbar spine's spinous processes at the L2-L3 level may both cause tenderness. MRI of spine showed bilateral involving the inferior articular process of L3 vertebra, The child was managed conservatively with analgesics and adequate rest. There was relief in back pain after 1 month. To conclude, Spondylolysis in children due to post-traumatic bilateral par interarticularis fractures is still a rarity. Children with undisplaced pars fractures and spondylolysis can be conservatively treated with adequate bed rest and analgesics. However, a more thorough examination is necessary in cases with post-traumatic displaced bilateral pars fractures.

Keywords: pediatric spine, traumatic bilateral pars interarticular fracture, Saudi Arabia

Introduction

A pars interarticularis fracture is associated with spondylolysis [1]. pars inter-articularis is a little bone isthmus that separates a spinal vertebra's superior and inferior articular facets. Although this deformity can manifest at any level, it most frequently affects the lumbar spine, especially at the L5 level (85%-95%) [2]. Young competitive athletes frequently experience low back pain (LBP), which frequently results in missed practice and competition time. In young-aged athletes Spondylolysis may be the source of chronic severe lower back pain [3]. Spondylolysis is uncommon in the upper lumbar area, despite the fact that it can also be found in the cervical spine [4,5]. Furthermore, to our knowledge, no published studies on successive degrees of spondylolysis that happen after a few years have been made. Here, we report a case of spondylolysis in pediatric soccer player at lumbar spine third and fourth vertebrae (L3-L4) levels, highlighting the potential for repeated spondylolysis levels coming from certain activities.

This manuscript was prepared following CARE guidelines

Manuscrito recibido: 05/12/2024

Manuscrito aceptado: 12/12/2024

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Case Report

History

A 12-year-old male soccer player who had fallen on his back while playing the game was brought to the orthopedic clinic at Alkabrah Health Centre in Saudi Arabia. He complained of moderate to severe back discomfort that had persisted for a week. His pain is intense, constant, made worse by movements that cause hyperextension, and it is lessened by rest and non-radiative analgesics. Fever has not occurred previously.

Physical examination: A neurologic assessment revealed no anomalous results. A physical examination revealed a normal gait and pelvic and spinal alignment. He was able to flex his spine without any problems, however he was uncomfortable when extending it. The paraspinal muscle region and the lumbar spine's spinous processes at the L2-L3 level may both cause tenderness.

Radiologic findings: Lumbar lordosis was the only significant finding in the Plain lumbar spine radiography. A CT scan showed bilateral L3 spondylolysis with preserved alignment. There was no associated spondylolisthesis found. MRI of spine showed, bone marrow oedema as high of T2 and relatively low T1 signal intensity which was seen involving the bilateral pedicles. L3 vertebral body was found to be associated with surrounding soft tissue edema, the id dark T1 and T2 signal intensity line was found to be involving the inferior articular process of the bilateral L3 vertebra, No bone marrow replacing lesion, no cord compression, no disc bulging, no spinal canal, neural foramina narrowing, and no nerve root compression was found (Figure 1).

The child was managed conservatively with analgesics and adequate rest. There was relief in back pain after 1 month.

Discussions

The word "spondylolisthesis" comes from the Greek "olisthesis," which means to slide or the glide down an incline, and "spondylo," which means vertebra. Wiltse classifications of spondylolisthesis were used as the basis for this one [6]. It is classified as following- I. Congenital dysplastic (the pars interarticularis may remain unchanged) II. Isthmic: A. Fracture of the pars due to lactic fatigue. B. Long but unbreakable pars. C. Acute pars fracture III. Pathologic fractures which can be found in cases with general of local bone diseases IV Post-Traumatic which can associate a severe injury which can fractures the supporting bone other than the pars. V Degenerative lesion which can be caused by longstanding inter-segmental instability. The case we are discussing

here had a type IIA2 (isthmic-lytic type) spondylolisthesis according to Wiltse classification [6].

There might be a connection between spondylolysis and repeated trauma. These bone abnormalities are more common in people who play sports frequently or work heavy jobs [7]. Combinations of hyperextension, lumbar spine rotation, and/or recurrent loading might exacerbate the posterior arch traumatic stress.

Conservative treatment options consist of bracing, physiotherapy, nonsteroidal anti-inflammatory drugs, and rest from the sport. Surgery is one



Figure 1. MRI of spine showed, bone marrow oedema as high of T2 and relatively low T1 signal intensity which was seen involving the bilateral pedicles involving both Right (R) and left (L)sides. L3 vertebral body was found to be associated with surrounding soft tissue edema, the id dark T1 and T2 signal intensity line was found to be involving the inferior articular process of the bilateral L3 vertebra, No bone marrow replacing lesion, no cord compression, no disc bulging, no spinal canal, neural foramina narrowing, and no nerve root compression was found.

less conservative treatment for pain which cannot be controlled by the other conservative measures. Selhorst et al. [8] discovered that unfavorable long-term (1.5 to 5.6 years) outcomes are more encountered in female cases with multilevel injuries and recurrent or continuous pain during treatment. Even in patients with bilateral spondylolytic injuries, they came to the conclusion that a multilevel injury is far more likely to have a bad prognosis than a single-level damage [3].

Fatigue fractures are considered to be the root cause of spondylolysis at different levels of the lumbar spine [9, 10]. There aren't many published cases of multiple-level lumbar spondylolysis[10], however Wong[11] and Dunn et al [12] have described two-level spondylolysis patients who responded well to conservative treatment. The diagnostic use of lumbrosacral radiography in the management of spondylolysis is limited.

A more sensitive method for the early detection of active spondylolysis is bone scintigraphy. A year after the fracture, there may be an increase in uptake[6]. Surgery or conservative treatment are options for treating multiple-level lumbar spondylolysis, which primarily affects the L3-51 region[12]. However, regarding the best interventions there is no agreement yet. A common intervention is taking a break from exercise and sports. In addition, our patient reported experiencing back pain during hyperextension exercises, which subsided once he rested. Multiple studies [13] have recommended that people take a minimum of three months off from sports; however, the length of time off can range from two weeks to six months, based on the symptoms severity and the desired outcomes of the intervention. While certain authors state that their aim is to establish a stable, pain-free union of the pars interarticularis fracture, others state that their aim is to return to full activity and achieve pain-free motion without necessarily achieving total bone healing [13].

After analyzing 15 trials that assessed long-term clinical results, Klein et al. [14] revealed 83.9% as a success rate of the conservative therapy. Bracing was not proved to affect significantly this outcome [14]. According to studies by Selhorst et al. [15], Cases with multi-levels vertebral injuries were about 11 times more likely to experience a negative outcome in the long run.

In order to achieve bone union and since there is a good chance of healing, athletes with early or progressing stages of spondylolysis should be advised to take a three-month break. Nonunion does not appear to indicate that the segment is unstable or to jeopardize the overall result in the short run. A positive clinical outcome may arise from fibrous healing [8].

Conclusion

Spondylolysis in children due to post-traumatic bilateral par interarticularis fractures is still a rarity. Children with undisplaced pars fractures and spondylolysis can be conservatively treated with adequate bed rest and analgesics. However, a more thorough examination is necessary in cases with post-traumatic displaced bilateral pars fractures.

Acknowledgment:

The deanship of Scientific Research at Northern Border University, Arar, KSA, funded this research work through the project number "NBU-FFR-2024-966-01

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