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Case reports

Clinical profile and rehabilitation of unilateral low back pain in a professional teenage cricket player in Sri Lanka: A Case Report

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Abstract

Cricket is a demanding sport that places significant physical stress on athletes. This case report details the clinical presentation and management of a professional teenage cricket player with persistent left-sided low back pain for over two months during fast bowling. A comprehensive physical examination and radiological assessment confirmed a stress fracture at the fourth lumbar vertebra. The patient underwent a carefully structured, four-phase rehabilitation program (Acute phase rehabilitation, rehabilitation to restore activities of daily living and basic sports-specific technical movements, rehabilitation for returning to sports activity, and rehabilitation for prevention of re-injury by addressing the intrinsic and extrinsic risk factors) over three months, leading to a successful return to competitive play. This case highlights the importance of individualized rehabilitation strategies in optimizing recovery and ensuring a safe return to sport for athletes with debilitating injuries.

Keywords: cricket; back pain; fast bowling coughing

Introduction

Cricket is a globally popular team sport that demands high levels of physical fitness, particularly for fast bowlers, who are subjected to repetitive high-impact movements. Among cricket-related injuries, low back pain is a significant concern, with studies reporting a prevalence of 22% among fast bowlers [1,2]. The repetitive flexion, extension, and rotational forces involved in bowling place considerable stress on the lumbar spine, increasing the risk of overuse injuries such as spondylolysis and spondylolisthesis [3]. The prevalence of lumbar spine anomalies in adult fast bowlers ranges from 24% to 55%, while junior bowlers face an even greater risk, with incidences as high as 64% [4,5].

The biomechanics of fast bowling contribute to these injuries, as the delivery action generates forces up to nine times the bowler's body weight, transmitting stress through the lower limbs to the lumbar spine. Prolonged bowling spells, insufficient recovery further exacerbate the risk of spinal stress fractures. Young cricketers are thought to be more at risk due to poor preparation and technique and subsequent overuse, according to studies [6]. Given the prolonged recovery periods associated with lumbar stress fractures (Averaging 32 missed games per reported case), early identification of risk factors and appropriate management strategies are crucial for injury prevention and long-term athlete well-being [2].

Case Report

An 18-year-old fast bowling all-rounder for the under-19 national team was referred to a sports medicine clinic with severe left-side low back pain. A persistent aching in his low back, which was worse on the left, began around two months before the presentation. His backache reached a peak during the overseas tour that featured two games in three days. Acute discomfort was adequately managed by withdrawing him from sports-specific training and competition, soft tissue therapy, and rest recommendations. Initial ice therapy and compression were given at that time. He was started on analgesics for 5 days.

The major problem resurfaced when the athlete began training and competition. During a heavy practice session soon after the rest in his club, he

suffered severe back pain. The discomfort was most intense during bowling practice, especially during the delivery stride and back foot contact, where the athlete must produce a significant hyperextension wind-up before releasing the ball at a good speed toward the batsman. He said the discomfort in his delivery stride and rear foot had reached a numerical pain. He had no history of fever, loss of appetite, or loss of weight during this period. He denied any radiation of the pain, paresthesia, weakness of the lower limb, and any urinary or fecal incontinence.

Examination

From the appearance, an 18-year-old patient is a well-built person with a height of 178cm and a weight of 82 kg. His BMI is 25.87 kg/m2. He was pleasant and interactive and did not show unnecessary worries. A musculoskeletal examination revealed that the patient's lumbar range of motion was restricted and guarded. Flexion was preserved at approximately 90 degrees. However, lumbar extension was reduced to around 10 degrees, compared to the expected normal extension of 25 degrees. At 45 degrees, a straight leg raise test (SLRT) on the left recreated his low back discomfort, but not on the right. One leg hyperextension test was positive for the player's left side. Erector spinae muscle hypertonicity was observed, with a tight hamstring on the left side. There was no sensory loss or weakness in the lower limbs.

Regarding the other systemic examination, his pulse rate was 72 bpm and his blood pressure was 118/80 mmHg which indicates regular and good blood volume. There were no murmurs. The respiratory rate was 16 /minutes, and chest expansion was normal with bilateral lung auscultation. The abdomen was soft and non-tender with no organomegaly.

A conservative care approach was implemented, which included immediate rest from sports and training, lumbopelvic soft tissue therapy, and spinal mobilizations. On initial presentation, spinal manipulation treatment was not used due to the patient's intolerance of posture as a differential diagnosis of spondylolysis. The player was managed by the Sri Lankan cricket team physician with the informed consent of the player.

Investigations And Diagnosis

The lateral lumbosacral radiograph shows osteophyte formation and relative narrowing of the L5/S1 disc space. The oblique view demonstrates a clear stress reaction at L5/S1, with a hypodense line and surrounding sclerosis. In addition, there are intermediate features of a pars interarticularis stress reaction at the L4/L5 level. There was no evidence of osteolytic or sclerotic lesions, spondylolysis, spondylolisthesis, and paravertebral masses (Figure 1). He was ordered a CT scan for the lumbar spine followed by an MRI scan of the lower dorsal lumbar spine (Figure 2). CT findings suggest pars fracture with mild sclerosis of the inferior articular process of the L4 vertebra on the left side. MRI was evident that the soft tissues of the region are normal and there is no intra or extradural hematoma.

Figure 1. Plane X-ray of lumbosacral spine; A-Lateral view, B- Anteroposterior view and C-Left oblique view.

Figure 2. MRI scan (A) and CT scan (B) of the lower dorsal lumbar spine. The arrow indicates

minor pars fracture with mild sclerosis of the inferior articular process of the L4 vertebra on the left side.

Management

He has been prescribed the oral pharmaceutical regimen; Celecoxib 200 mg bd, Omeprazole 20 mg bd, and Tizanidine 2mg bd for 7 days. He was on a specified workout regimen and followed up by the Sri Lanka cricket under 19 physiotherapists. His rehabilitation exercise chart includes everyday spine muscle strengthening exercises and stretching exercises for low back and lower limb muscles as well as abdominal muscle strengthening.

Rehabilitation

Rehabilitation of the patient was done in four phases. Acute phase rehabilitation, rehabilitation to restore activities of daily living and basic sports-specific technical movements, rehabilitation for returning to sports activity, and rehabilitation for prevention of re-injury by addressing the intrinsic and extrinsic risk factors.

Phase 1 – Acute phase rehabilitation

Following the field side management, NSAIDs and muscle relaxant oral medications started a structured way of loading his low back. Initially, for the first

two weeks, he was prescribed physical exercises that did not increase his pain. Pallof press, supine hold, adductor bridge hold, cable Russian twist hold, medicine ball squeeze, and squeeze ball hamstring curls were given for the initial rehabilitation. Bench press, Goblet squat, Pistal squat, single leg hamstring bridges, and single leg presses were done for strengthening. Hamstring, quadriceps, and calf muscle stretching were introduced initially in the lying down position and gradually prescribed to increase the stretchability.

Phase 2 – Rehabilitation to restore activities of daily living and basic sports-specific technical movements

He was taught proper sitting, lifting, throwing, and sleeping positions, as well as lower back strengthening activities. Increase the load and intricacy of the motions gradually. The patient followed these exercises for two weeks.

Phase 3- Rehabilitation for returning to sports activity

Gradually he started on proprioceptive exercises and sport-specific exercises. After 1 month of phase 1 and 2 exercises, he was asked to bowl with 50% of his effort. His bowling action was changed by the bowling coach. He was asked to practice the new action initially with a plastic ball. With the continuation of core muscle strengthening, he was asked to increase the bowling speed gradually. This phase was conducted for one month.

Phase 4 – Rehabilitation for prevention of re-injury by addressing the intrinsic and extrinsic risk factors

This was achieved by increasing his BMI to an appropriate level and adding two times per week gym-based core muscle strengthening exercise regimens for one month. He has been educated on the necessity of a balanced healthy diet that includes appropriate water and electrolytes, as well as avoiding high-calorie unhealthy diets.

Discussion

Spondylolysis is a kind of stress fracture that occurs when the pars inter-articular is subjected to mechanical stress [7]. Rather than being produced by a single traumatic incident, stress fractures are created by recurrent strain and stress. The stress distribution in the pars inter-articularis is the greatest in extension and rotation motions [8]. Due to repetitive hyperextension, which increases the contact between the caudal border of the inferior articular facet of L4 and the pars inter-articular of L5, spondylolysis is most common at L5 (80-95 %) [9]. In this case report, the player is a fast bowling allrounder, who is doing repetitive hyper-extensive moments while fast bowling. Importantly this player developed L4 pars stress fracture, unlikely that the most common L5 level. According to the Wiltse Classification of Spondylolysis this patient has developed a Type IIA (Isthmic) spondylolysis at the L4 level.

Hyper-lordosis posture and low back discomfort during lumbar extension are the most typical signs of lumbar spondylolysis. To validate the diagnosis, the Michelis' test or unilateral extension test is used. While standing on one leg, the patient executes lumbar hyperextension. Pain is replicated in a positive test. When standing on the ipsilateral leg, unilateral lesions frequently cause discomfort [10]. Similarly, in this case, the player precipitated his pain on extension rather than flexion and the Michelis test was positive on examination.

The combination of SPECT (single-photon emission computed tomography) and CT is the gold standard for diagnosing spondylolysis. When there is a pars fracture, computed tomography may clearly show spondylolysis. The neural arch should be closed and continuous at the level of the pedicles on axial CT images. There is discontinuity at this level when there is a pars defect. Sagittal CT scans are the most reliable in detecting incomplete fractures and distinguishing between a pars defect and the facet joint. Spondylolysis can be detected using MRI, but it can also be used to assess the health of the disc above and below the afflicted vertebra [11]. Antero-posterior, lateral, and oblique X-ray films of this case were not significant. Moreover, the MRI was not remarkable regarding this patient's L4 pars stress fracture. Our case highlighted the concept that the CT scan is ideal to diagnose spondylolysis by revealing the minor L4 pars stress fracture. However, the Gold standard imaging modality is the thin- slice reverse gantry CT.

Conservative therapy for symptomatic spondylolysis is typically sufficient, to reduce discomfort and speed up the healing process [12,13]. NSAIDs for pain management, discontinuation of aggravating (sporting) activities, and the use of a spinal brace to limit mobility at the damaged pars and enable bone healing are all possible characteristics of

conservative therapy. When significant discomfort persists, aggravating activities must be avoided, which may necessitate surgical intervention. The most recent treatment methods aim to restore the afflicted pars while preserving segmental mobility. In this case, the player was managed in 4 phases. Initially, acute phase rehabilitation started with medical management and physical exercises that did not increase his pain. Basic exercises were started in a flat position. Then considered the rehabilitation to restore activities of daily living and basic sports-specific technical movements. Rehabilitation for returning to sports activities was started with sports-specific exercises and proprioceptive exercises to improve his agility and accuracy in bowling and batting. Finally, the rehabilitation to prevent reinjury was done through regular core muscle strengthening and changing his fast bowling action with the aid of the fast bowling coach of the team.

The rehabilitation protocol implemented in this case aligns closely with internationally accepted guidelines for managing pars interarticularis stress fractures in athletes. It followed a structured, phase-based approach beginning with pain control, activity modification, and isometric core activation, then progressing through functional retraining, sport-specific loading, and injury prevention. The gradual return to bowling with reduced intensity, postural re-education, and technique modification under the supervision of a coach reflects current best practices in elite sports settings. International guidelines emphasize non-operative management in adolescents, with progressive loading, core strengthening, and correction of biomechanical risk factors. This case also incorporated nutritional counseling and BMI optimization, highlighting a comprehensive, multidisciplinary approach consistent with global standards for safe return to play and long-term prevention of recurrence.

Conclusion

The patient, who suffered from left-sided low back pain for more than two-month duration during fast bowling, was diagnosed with a stress fracture at the fourth lumbar vertebrae. The three months rehabilitation program in 4 phases was successful. Thus, with the success of our rehabilitation process, it is highly recommendable to any other person who has gone through such an injury. Despite the fading hopes of national aspirations, we proved otherwise by facilitating a successful recovery from the injury and supporting the player in achieving his goal.

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Authors' Contributions

EC conceived the study design, conducted analyses, and drafted the manuscript. DA supervised the project and finalized the manuscript, while HA guided the rehabilitation program. LR assisted with radiological investigations, critical revision of the article, and literature Review. All authors have read and approved the final version of the manuscript and have provided their consent for publication.

Competing Interests

The authors declare no potential conflict of interest with respect to the research, authorship, and publication of this article.

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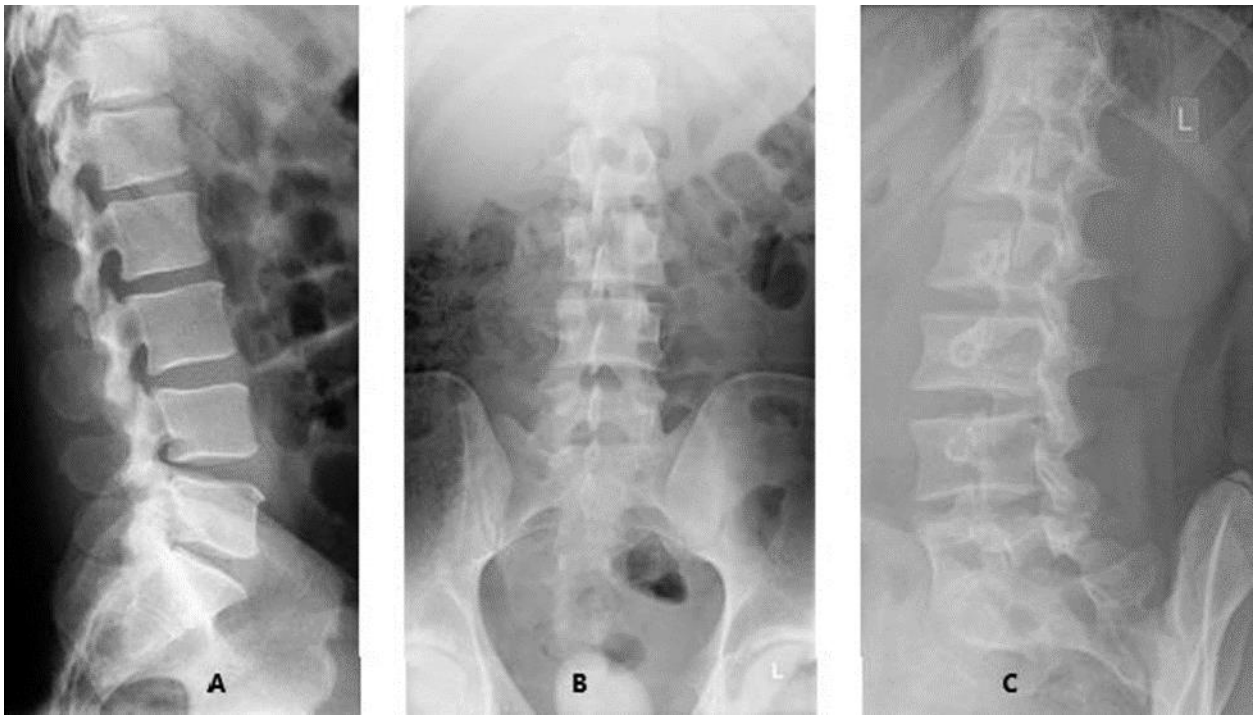

Figure 1. Plane X-ray of lumbosacral spine; A-Lateral view, B- Anteroposterior view and C- Right oblique view.

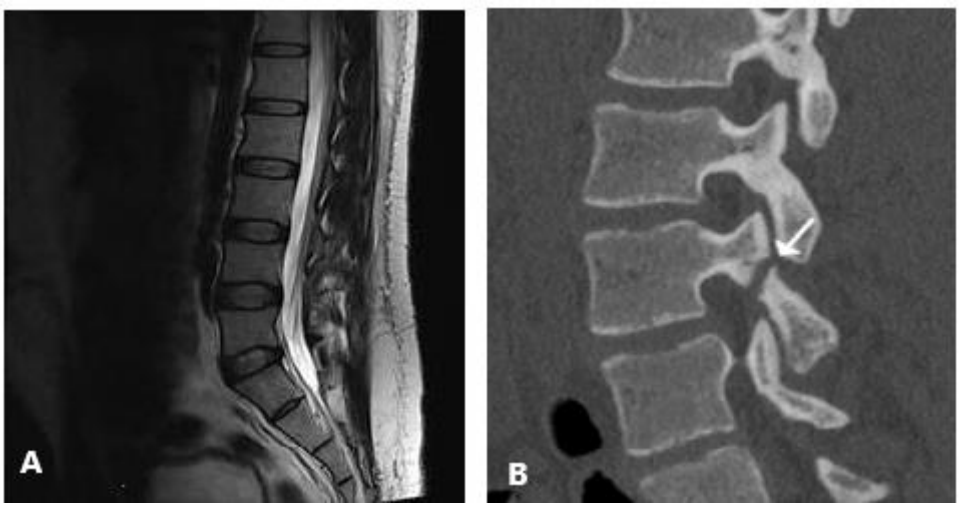

Figure 2. MRI scan (A) and CT scan (B) of the lower dorsal lumbar spine.

The arrow indicates pars fracture with mild sclerosis of the inferior articular process of the L4 vertebra on the left side. MRI does not indicate bone edema in spondylolysis of the stress reaction related to stress fracture, which may hint an old stress fracture with sclerotic margins.