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Stress fracture of the lumbar facet in an athlete-an unusual presentation: A case report

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Abstract
Introduction: Many athletes seek consultation from sports medicine or spine care providers for low back pain. Low back pain accounts for 5-8% of all sports injuries, next only to knee, ankle and shoulder. Only three reports of lumbar facet fractures in athletes can be found in the literature but none have been reported in runners. The awareness about the condition is important in identifying and treating the cause of low back pain.
Case presentation: A twenty two year old female athlete studying in sports school and competing in 100 metres, 200m, 400m track events came to us with a history of low back ache for 7 years for which she had sought medical attention from various hospitals, preventing her from her athletic training and limiting her activities of daily living. She had previously been treated with physical therapy and one injection of steroid to her sacro-iliac joint which did not give her a lasting relief. On examination, she had tenderness over the fifth lumbar vertebra and extension of the spine was painful. She also had a Lenke 1 less than 30 degree scoliosis which did not need any active intervention. Radiographs showed facet tropism at L5-S1 facet joint. CT scan showed undisplaced fracture line involving the inferior articulating process of L5, sclerosis of the proximal fragment, de-mineralisation of the distal fragment with significant right sided facet joint arthropathy at L5/S1 level. MRI scan showed right L5-S1 facet joint hypertrophy. There was no features of sacro ilitis. Right side facet joint block was given which produced relief of her symptoms, confirming the pain to be of the facet origin. She underwent right trans-foraminal lumbar interbody fusion at L5-S1 level. She has complete relief of her symptoms at 12 month follow up and has no problems with her day to day activities, although she has stopped her sports activities due to fear of recurrence of pain
Conclusion: Lumbar facet stress fracture is a very rare condition and awareness about the condition is important to identify and treat the condition. It may require surgical fusion if not completely responding to conservative measures.

Keywords: lumbar facet, stress fracture, facet arthropathy, athlete, trans-foraminal lumbar interbody fusion (TLIF)

Introduction
Low back ache accounts for 5-8 % of all athletic injuries [1], next only to knee ankle and shoulder injuries. It is one of the most challenging conditions for the sport physician or a spine surgeon to diagnose and treat. Factors pre disposing an athlete to back injury include growth spurt, abrupt increase in training intensity or frequency, improper techniques, unsuitable equipment and leg length inequality[1]. Athletes who take part in activities involving repeated and forceful hyper extension of the spine may develop lumbar facet syndrome, spondylolysis or spondylolisthesis. Only three reports of lumbar facet fractures in athletes can be found in the literature but none have been reported in runners. The awareness about the condition is important in identifying and treating the cause of low back pain.

Case report
A twenty two year old female athlete studying in sports school and competing in 100 metres, 200m, 400m track events came to us with a history of low back ache for 7 years for which she had sought medical attention from various hospitals, preventing her from her athletic training and limiting her activities of daily living. She had previously been treated with physical therapy and one injection of steroid to her sacro-iliac joint which did not give her a lasting relief. On examination, she had tenderness over the fifth lumbar vertebra and extension of the spine was painful. She also had a Lenke 1 less than 30 degree scoliosis which did not need any active intervention. Radiographs showed facet tropism at L5-S1 facet joint. CT scan showed undisplaced fracture line involving the inferior articulating process of L5, sclerosis of the proximal fragment, de-mineralisation of the distal fragment with significant right sided facet joint arthropathy at L5/S1 level. MRI scan showed right L5-S1 facet joint hypertrophy. There was no features of sacro ilitis. Right side facet joint block was given which produced relief of her symptoms, confirming the pain to be of the facet origin. She underwent trans-foraminal lumbar interbody fusion (TLIF) at L5-S1 level. She has complete relief of her symptoms at 12 months follow up and has no problems with her day to day activities, although she has stopped her sports activities due to fear of recurrence of pain

Discussion
Low back pain accounts for 5-8% of all sports injuries, next only to knee, ankle and shoulder[1]. There is a sizeable body of literature on facet pain in the general population. However, there is a

paucity of published literature on facet pain in athletes specifically. Distinguishing pain coming from the facet joints versus pain coming from other nearby structures can be challenging. Differential diagnosis of extension based low back pain include [2] facet pain, pars inter articularis stress response of stress fracture, pedicle stress response or fracture, sacral stress fracture, sacro iliac joint pain, facet process fracture, disc pain, vertebral end plate fracture, vertebral body fracture. Recent histologic studies have demonstrated that lumbar facet joint capsules are innervated richly with encapsulated, un-encapsulated, and free nerve endings indicating facet joint or medial branch blocks may be effective in diagnosing and treating facet joint pain [3, 4, 5, 6]. The hallmarks of facet pain include low back pain without radicular referral that is worse with standing, worse with lumbar extension and axial rotation, and improved with sitting or lumbar flexion.

Alyas and turner [7] described the MRI findings in 33 asymptomatic tennis players and found that abnormalities were frequent, predominately in the lower lumbar spine, almost exclusively at L4/5 and L5/S1 levels. Pars injuries and facet joint arthroses were relatively common. They did not report any cases of facet process fractures though 23 patients had facet joint arthropathy. Fehlandt [8] reported a case of stress fracture in a ballerina who was treated with surgical fusion after failed conservative management David c mann *et al*. [9] reported a case of inferior articular process fracture in a college linebacker, which was treated with rest and vigorous rehabilitation program. They had also previously reported a fracture of inferior articular fracture of 3rd lumbar vertebra which was successfully treated conservatively. Both these patients had significant trauma leading to the fracture

Mitchell *et al*. [10] reported 5 cases of isolated fractures of articular processes of lumbar vertebrae in professional football players 3 of whom improved with rest alone and 2 patient had to undergo surgical fusion of the facet joint

Omar *et al*, [11] reported a case of stress fracture of superior articular process of L5 vertebra in a skier and found that the fracture had not united even after14 months of conservative treatment with rest and activity limitation. In our case, the athlete was a runner taking part in track events with stress fracture of the L5 inferior articular process who had to undergo right trans-laminar interbody fusion at L5-S1 level for relief of symptoms.

Conclusions

Lumbar facet stress fracture is a very rare condition and awareness about the condition is important to identify and treat the condition. It can be accurately diagnosed by facet or medial branch block. It may require surgical fusion if not completely responding to conservative measures

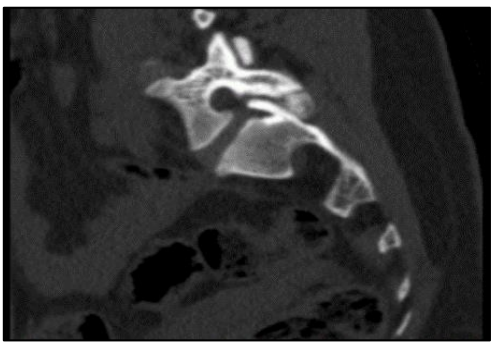

Fig 1: sagittal section showing undisplaced fracture involving the inferior articulating process of L5

Fig 2: coronal section showing fracture involving the inferior articulating process of L5

Fig 3: 3D reconstruction showing facet hypertrophy

Fig 4: Intra operative radiograph after TLIF–Anteroposterior view

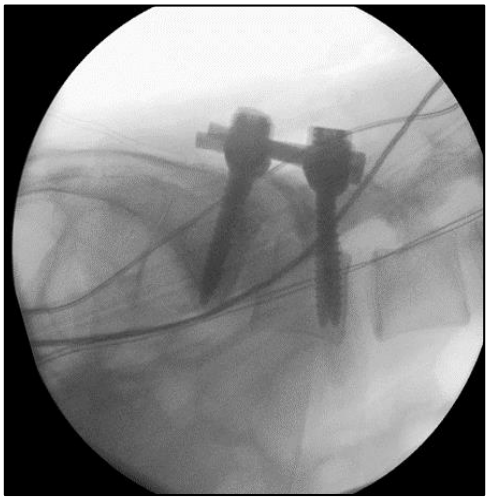

Fig 5: Intra operative radiograph after TLIF – lateral view

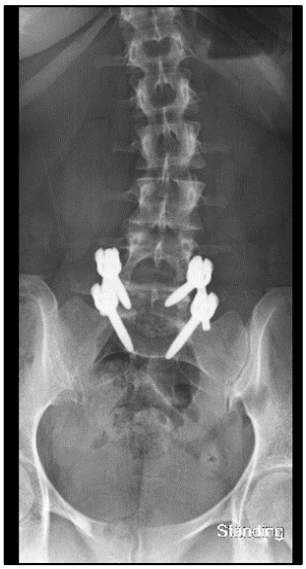

Fig 6: AP view at 12 months follow up

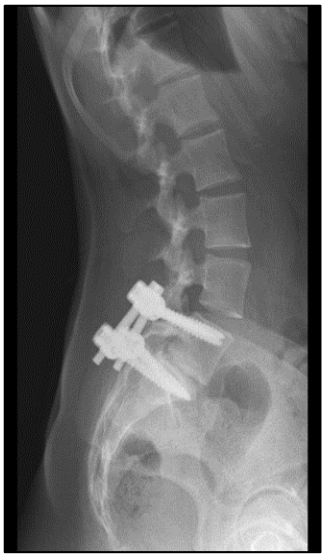

Fig 7: Lateral view at 12 months follow up

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