



QUESTION | MY QUESTION RELATES TO LUMBAR STRESS FRACTURES. I HAVE HAD A FEW TEENAGERS RECENTLY WHO PRESENTED WITH LOWER BACK PAIN AND WERE ULTIMATELY DIAGNOSED WITH LUMBAR STRESS FRACTURES. IS THERE ANY WAY I CAN BE MORE CONFIDENT TO MAKE THIS DIAGNOSIS IN THE EARLY STAGES?

ANSWER | Lumbar stress fractures are a common cause of lower back pain in adolescence. Up to 30% of athletes between 11-17 may have lower back pain, and a high index of suspicion for stress fracture should be maintained in this age group. Whilst back pain of some sort is common, it is unusual to last more than a few weeks with appropriate treatment. If back pain persists past this time, is worse with activity or recurrent, then there should be a low threshold for investigation for lumbar stress fractures. This is even more so in high risk sports involving lumbar extension and rotation, such as gymnastics and cricket fast bowlers.

Lumbar stress fractures occur due to an overload of the pars interarticularis region. The L5 level is most commonly involved, in around 85-90% of cases, followed by L4. Higher levels are uncommonly affected, but can occur. Symptoms occur commonly in adolescence, and generally relate to exercise that involves extension and/or rotation. Classic sports affected include cricket fast bowling or gymnastics, but they may occur in any running or pivoting sport.

Stress fractures may occur in structurally normal bone. There are also chronic bony lesions in this area known as 'pars defects'. A pars defect is not congenital, but develops early in life. It is present in around 5% of the population and is often asymptomatic. It has a genetic association. It may be aggravated with similar activities that cause acute stress fractures. When the pars defects are bilateral there may be a slippage of one vertebra on another, which is known as a spondylolisthesis.



Fig 1. The single-leg hyper-extension test ('stork' test)

Historically the patient will complain of a gradually evolving lower back pain, usually unilateral, which is worsened by their chosen sport and improves with rest. At its worst the pain may be present in daily activities or even at night. Often it will grumble on for many months before a diagnosis is made

Clinical examination will reveal pain that is worsened by positions of spinal extension. More specifically extension/rotation or single leg hyperextension to the affected side (the 'stork' test) may also reproduce pain. Tenderness may be palpated at the lumbosacral level, 1cm lateral to the midline.

A plain X-ray is the simplest method to investigate the adolescent with back pain. It may show a pars defect or even a spondylolisthesis. Oblique views are more sensitive for pars defects, but increase the radiation dose. Further investigation may be needed to make the diagnosis. This may initially involve a bone scan, which is very sensitive for diagnosing stress fractures and confirms bony activity, and a limited CT scan to stage the lesion as acute or chronic. MRI scanning may be a viable alternative as it avoids radiation, but is not as sensitive as the combined bone scan/CT.

The prognosis for lumbar stress fractures is generally favorable. The treatment will involve complete rest from all sport for anywhere up to 3 months. Bracing has been used historically, but had not been shown to improve outcomes and is reserved only for recalcitrant pain.

The period of rest required will be guided by the stage of the lesion on the CT scan. A Japanese study by Morita et al. demonstrated that with rest, union of the fractures occurred in 75% of early lesions, 40% of progressive lesions and 0% of terminal lesions. As such, terminal lesions only require rest until symptoms resolve as healing is unlikely, as opposed to early lesions where healing is the goal and more prolonged rest is needed. Radiological signs of a terminal lesions include sclerosis and widening of the pars defect, bilateral defects and associated spondylolisthesis.

Physiotherapy is required to improve lumbar mobility and flexibility. Home exercises to stretch the hamstrings, hip flexors and gluteals, as well as to strengthen core stabilizing muscles should be performed daily. Technique correction is important, especially in cricket bowlers where a 'mixed action' of shoulder and hip counter-rotation is believed to be a predisposing factor.

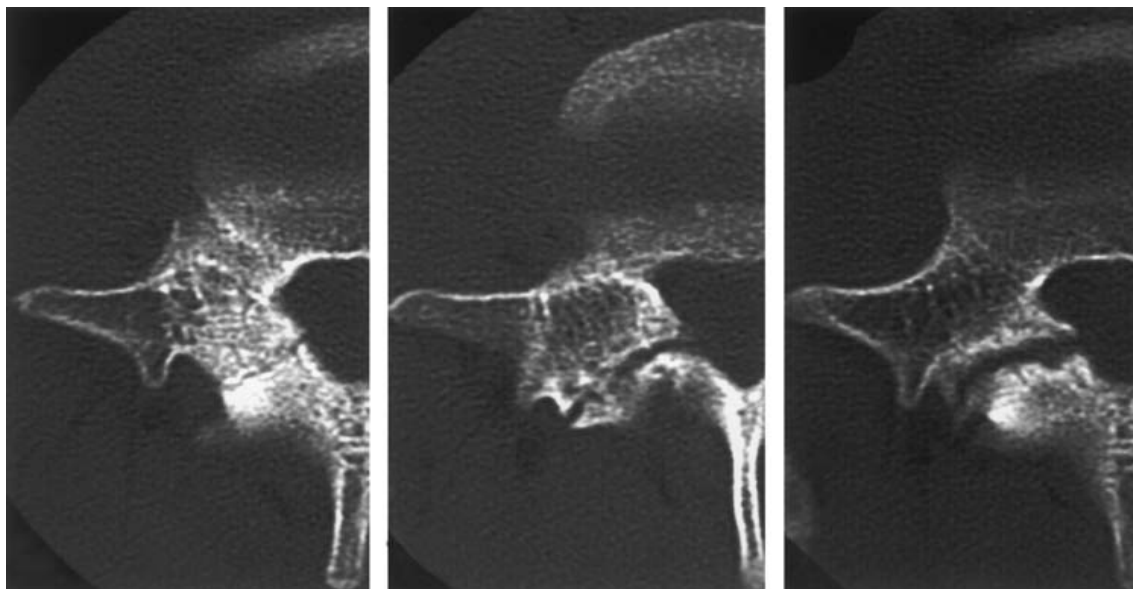


Fig 2. Representative CT images of stress fractures in a) the early stage, b) the progressive stage and c) the terminal stage.

Take Home Messages

- Lumbar stress fracture is an important cause of lower back pain in adolescents and requires a high index of suspicion for diagnosis
- Stress fractures are caused by activities that cause extension and rotation of the spine, but may simply occur in active kids
- The pain is usually insidious and persistent over a period of time
- Diagnosis requires imaging in the form of an X-ray, bone/CT scan or MRI
- Treatment involves a period of complete rest from sport but invariably leads to a favorable outcome
- Technique assessment in cricket fast bowlers is essential

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