CASE REPORT

A stress fracture of the lumbar spine in a professional rugby player

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In modern rugby, the spine is subjected to great physical pressure, with an increased number of impacts, on both the cervical and the lumbar spine. This case report illustrates overuse injuries of the lumbar spine in international professional rugby players. A 32-year-old sportsman had been practising rugby for 24 years and was playing for a championship level French team when he started suffering from a right lateral pain in the lumbosacral spine. A CT scan showed a unilateral isthmolysis and a coronal irregular fracture of the right pars interarticularis of L5. This led to discussion of (1) the importance of the decision on the date of return to playing rugby and (2) the future of professional rugby players with chronic spinal injuries.

In modern rugby, the spine is subjected to great physical pressure. Indeed, there is an increasing number of impacts involving axial loading and radial torque, especially on the cervical spine, but also on the lumbar spine. The players have become larger, the game faster, with more sequences and less recovery time. We can distinguish acute spinal injuries and also chronic and overuse injuries. We present here the case of a 32-year-old international professional rugby player in a

championship level French team, who presented with a stress fracture of the right pars interarticularis of L5.

CASE REPORT

A 32-year-old man had played rugby for 24 years. He was a professional player as second lock then number 8, for 10 years, playing also for the Irish national team. He had a 3-month history of right lateral pain in the lumbosacral spine that increased dramatically with flexion or hyperextension, during prolonged running or acceleration, or on the landing of a jump.

Clinically there was a right local “spot” pain with pressure on L5, but without sciatic irradiation, sensation or motor deficits, and no loss of reflexes.

Standard x ray of the lumbar spine showed left isthmolysis of L5, without antelithesis, and a bone condensation of the right pedicle and of the pars interarticularis. Bone scintigraphy showed only a hyperfixation on the right side of L5 (fig 1). A CT scan with multiplanary reconstruction confirmed the unilateral left isthmolysis, and most importantly, a coronal irregular fracture of the pars interarticularis, associated with condensing of bone in the pedicle (fig 2a,b).

A period of rest was recommended, with anterior interosseous nerve syndrome treatment and physiotherapy. In the meantime, two essential questions were brought up by the case of this rugby player, firstly about the date of return to playing rugby,¹ and secondly about the future of his professional career.

DISCUSSION

Stress fractures of the lumbar spine in sport are well known,² especially in gymnasts where unilateral isthmolysis increases the traction forces on the opposite side.^{3–4} The difference in the case reported here is that rugby is a collision sport with axial loading phases and rotational forces (scrum, rucks and mauls) and with impacts (tackles), and running or jumping periods. The physiological locking of the lumbosacral spine that contributes to its protection is usually impossible because of concurrent interactional forces with opponents for possession of the ball. In addition, we know that biomechanical constraints on the lumbar spine can be huge, as measured in American football: these were reported to range between 3000 and 8670 N, depending on the axial loading forces exerted during the different phases of the game.⁵

It is crucial to detect these spinal anomalies in young rugby players to avoid the “over risk” of acute or chronic injuries.” This is the reason why the French National Professional Rugby League decided in 2002 to organise a systematic screening in rugby academy centres that includes standard x ray and MRI of the cervical and lumbar spine. Such early examination conducted in young rugby players aims at detecting congenital or developmental anomalies that could increase the risk of spinal injuries for players aged <21 years who aspire to join professional teams. If the screening gives evidence for the existence of spinal abnormalities (eg, narrowing of the spinal canal, spondylolysis, congenital block vertebrae), the medical

Figure 1 Coronal view of bone scintigraphy of the lumbar spine, showing a spot of hyperfixation on the right side of L5.

Figure 2 Sagittal (A) and axial (B) reconstruction of the lumbar spine showing the linear coronal fracture of the pars interarticularis associated with bone condensation.

What is already known on this topic

It is well known that unilateral isthmolysis leads to stress fracture of contralateral pars interarticularis because of asymmetric loading forces, especially in young gymnasts, with or without spondylolisthesis.

What this study adds

Rugby is a sport which involves a range of various physical phases: running at different speed, stepping and jumping with hazardous landing, engaging in rucks and tackles with great forces at impact and scrummaging. All these actions lead to some great uncontrolled forces applied on players' low back, especially if they play at forward posts. A radiological screening to detect congenital anomalies, likely to weaken the player's spine, would allow preventing these chronic overuse injuries.

staff of the formation centre can issue a contraindication for playing rugby at a high level, which would certainly compromise the player's chances of signing a contract with a professional team.

Since 2003, the spinal screening described above, has been extended to all professional players taking part in the French Championship. Indeed, in players aged >21 years, for whom anomalies were detected, there is a further complication of contractual obligation, which is analogous to the position of workers in factories, where ergonomic constraints are defined by the Work Code. Since the inception of professional rugby in

1995, an increasing problem for professional players is unforeseen unemployment due to acute or chronic spinal injuries. This raises the problem of managing the career of rugby players who cannot practise their activity any longer as a result of serious incapacities induced by this sport.

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