

A rare case of non-contact salter harris type 2 fracture of distal femur during a football match

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SUMMARY

Distal femoral physeal fractures in adolescents are often due to high velocity injuries. We present an unusual case of a non-contact distal femoral physeal fracture that occurred during a football match. A torsional force had been directed at the fracture site occurring at the growth plate causing a transverse fracture rather than a spiral fracture. It is important to be aware that such fractures can occur despite little or no evidence of contact. These type of injuries should also be treated as an emergency to reduce the risk of further complications.

INTRODUCTION

Injuries occurring while playing football in adolescents is high as it is the most widely played sport worldwide. The types and pattern of injury vary according to skill levels, energy levels and musculoskeletal development. The lower extremities are at greater risk for injury compared to other parts of the body. Displaced distal femoral physeal fractures in adolescents are reported as rare with a high incidence of complications.¹

Distal femoral physeal fractures in adolescents are frequently reported due to high velocity injuries. We present a rare case of non-contact distal femoral physeal fracture that occurred during a football match.

CASE REPORT

A 14 year- old, healthy boy with no personal or family history of cancerous tumor or bone disease was injured while playing football at school. The injury was witnessed by the teacher in charge. The patient provided a history of accidentally stepping on the ball, losing balance and falling on his right side with the right knee in a flexed position. He was unsure if any sound was heard during the incident. He had no other injuries. He complained of severe pain at his right knee which was markedly deformed and swollen. On further questioning, his diet was normal and the football field ground was soft with grass.

Physical examination showed an adolescent with a normal body build. His height was 155 cm. Weight was 43 kg. His body mass index was 17.9 which was normal for his age. The proximal part of the knee was swollen with bony prominent on the medial side of the distal femur. Bruising was seen at the right upper quadrant of the right knee. There was no open wound seen. The distal thigh compartment was soft,

tender, with a minimal effusion. Distal blood circulation was good.

The initial radiograph showed a right distal femur fracture Salter Harris type 2 (Figure 1.1). Blood investigations which included a full blood count, renal profile, liver function tests, serum calcium, serum magnesium and serum phosphate were all within normal range.

He underwent a closed manipulative reduction which was successful to achieve acceptable reduction. He was then discharged with a full length cast. In view of the stable reduction and to minimize injury to the growth plate, we opted for conservative treatment. Upon follow up one year post trauma, the fractured bone had united with acceptable alignment (Figure 1.2). He was able to get back to his routine activity. The lower limb discrepancy was 1cm, less on the affected limb.

DISCUSSION

The majority of distal femur physeal fractures are caused by direct contact to the femur. A huge amount of force is needed to overcome the mechanical strength of the bone and cause a fracture.² This case is unique in that it deviates from the normal mechanism of injury. No significant physical contact was involved in this case. As such, other biomechanical factors need to be studied to better understand the pathomechanics of this injury.

The pathomechanics of femoral fracture can be divided into 4 types depending on the force encountered. An angulation fracture is due to the application of a perpendicular force. This typically results in a transverse fracture. A torsion fracture is due to torsional force and usually results in a spiral or oblique fracture. A missile fracture is an open fracture where the severity of the injury depends on the velocity of missile causing the injury. The fourth type is due to impaction force. This longitudinal compression force causes a failure of structural bone. A significant amount of force is required to cause a fracture of the femur.³

An analysis of the mechanism of injury in this case suggests that a form of torsion was applied to the femur. However, instead of a spiral or an oblique fracture as would be expected with torsional forces, a transverse fracture occurred most probably because the site of the injury was at the growth plate.

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Fig. 1.1



Fig. 1.2

CONCLUSION

Salter Harris type injuries of the distal femur should be treated as a dislocation of the knee and is therefore a medical emergency. Medical practitioners should be aware that this type of fracture can happen without direct contact or significant force. Biomechanical factors must be investigated. Good clinical knowledge and appropriate skill will reduce the risk of complications, especially where the typical mechanism deviates from the norm, as in this reported case.

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