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Take home message

Bilateral rupture of the biceps brachii tendon is rare. It can be treated conservatively or surgically. In active individuals, operative management can be successful. This may require several reconstructive procedures especially if advice not to overstress the repair is not followed.

A rare fracture-dislocation of the hip in a gymnast and review of the literature

J C Mitchell, P V Giannoudis, P A Millner, R M Smith

Abstract

Posterior fracture-dislocation of the hip is an uncommon injury in athletics and leisure activities. It is more commonly seen in high energy motor vehicle accidents and occasionally in high energy sporting activities. A rare case is reported of posterior fracture-dislocation of the hip joint that occurred in a young athlete during gymnastics. This unusual mechanism of injury illustrates the great forces sustained by the hip joint of gymnasts. Early reduction and operative treatment led to a congruent and stable hip joint. After rehabilitation, she returned to light sporting activities after six months.

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Keywords: fracture-dislocation; hip; gymnast; operative treatment

Posterior fracture-dislocation of the hip is usually the result of high energy accidents. Most of the cases are associated with road traffic accidents when the knee strikes the dashboard and the femur is driven posteriorly into the acetabulum.¹ We present a rare case in which the injury occurred in a 13 year old female gymnast during a practice run up. This type of injury generated by this mechanism has not been reported previously. A review of the literature on fracture-dislocations of the hip joint in sports is also presented.

Case history

A 13 year old female gymnast presented to our accident and emergency department after an

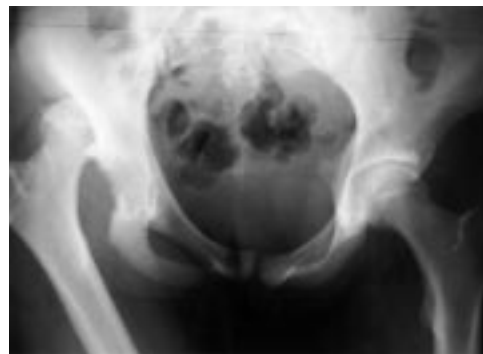


Figure 1 Posterior fracture-dislocation of the hip.

injury to her right hip at school during gymnastics. She had been performing gymnastics for about five years. She was 5 feet 6 inches tall and weighed 110 pounds. She reported that she was practising her run up before attempting a vault and landed one footed on a springboard left at an incline of 45° against the far side wall of the gymnasium. At the time of impact, the hip was flexed with a one foot impact. The hip was then adducted and internally rotated around the planted foot, resulting in sudden pain in the hip and an inability to bear any weight.

On examination, the right leg was found to be clinically dislocated posteriorly, the sciatic nerve was intact, and there was no evidence of vascular injury. Plain radiographs disclosed a posterior fracture-dislocation of the right hip (fig 1). There was no history in the family of any connective tissue disease or joint hypermobility. An urgent closed reduction under general anaesthesia was performed. Computed tomography scan illustrated a congruent re-

Department of Trauma and Orthopaedics, St James's University Hospital, Leeds, United Kingdom

J C Mitchell
P V Giannoudis
R M Smith

Department of Trauma and Orthopaedics, University of Leeds
P A Millner

Correspondence to:
R M Smith, Department of Trauma and Orthopaedics, St James's University Hospital, Beckett Street, Leeds LS9 7TF, United Kingdom.

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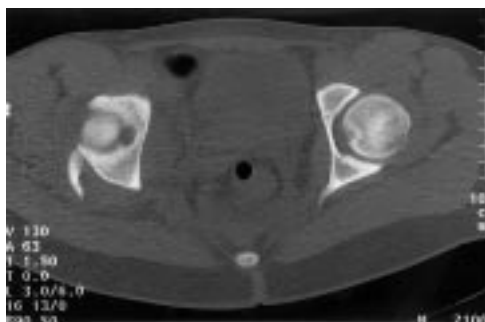


Figure 2 Computed tomography scan of the hip joint showing a congruent reduction of the joint with an associated posterior wall fracture.



Figure 3 Radiograph of hip after stabilisation of the fracture with lag screws and a buttress plate.

duction of the principal part of the joint with an associated posterior wall fracture (fig 2). There was no significant marginal impaction.

A standard posterior wall acetabular reconstruction was performed using a Kocher-Langenbeck (posterior) approach. The fracture was stabilised by lag screws and a buttress plate (fig 3). The patient was mobilised, touch weight bearing on the third day after the operation, and discharged home uneventfully on the sixth day after the operation with the aid of crutches. Follow up at 12 months was satisfactory, with the patient able to move without pain and the aid of crutches; she had already returned to light sporting activities six months after the injury. Follow up radiographs of the joint showed maintenance of joint congruity and no evidence of avascular necrosis of the femoral head or heterotopic ossification.

Discussion

Posterior wall fractures of the acetabulum account for about a third of the cases in most series.² More than 70% of these injuries are sustained in high energy road traffic accidents; the incidence of such injuries is said to parallel the degree of energy transfer in these accidents.³ The incidence of such injuries in sport is much lower;⁴ although they have been well documented in American football, rugby,

skiing, horse riding, cycling, and even jogging,⁵⁻⁸ we cannot identify a previous report of this injury occurring during gymnastics.

The normal mechanism is an axial force along the femur with the hip flexed. This is usually applied by impact on a dashboard or the like during a rapid deceleration road traffic accident. In our case the gymnast had the hip flexed, adducted, and internally rotated at the time of injury. The inclination of the springboard was greater than normal for a vault and we believe that this contributed to the injury pattern. Letournel and Judet⁹ showed that the posterior acetabular rim bears the impact from the femoral head in this position. The mechanism will be the same in this case; laboratory models have shown that the joint reaction force during the stance phase of a running gait can reach up to five times the body weight¹⁰ and is likely to be even greater at the impact of a gymnastic vault.

Traumatic hip dislocations in children and adolescents have also been described,¹¹ but these are rarely associated with fracture.

Indications for operative management of this type of injury include significant articular displacement (more than 2 mm), instability of the joint after closed reduction, irreducibility of the hip, neurovascular injury, and ipsilateral femoral fracture.¹²

In our case operative intervention produced a stable congruent joint; after 12 weeks of restricted weight bearing, the gymnast increased her activity. After rehabilitation, she was able to return to light sporting activities six months later.

Contributors: P G initiated and coordinated the collection of information. J M interviewed the patient and wrote the paper with P G. P M participated in the design and editing of the paper. M S performed the operative procedure and participated in the design and editing of the paper.

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Take home message

Posterior wall fractures of the acetabulum are not common in sports. In gymnastics care should be taken to avoid performing a vault or practising a run up when the inclination of the springboard is greater than anticipated. Operative intervention is required to produce a congruent joint.