From the clinic

traction, then mobilized from non-weight bearing to partial weight bearing, and is now fully recovered.

Case 2

A 48 year old man presented after being involved in a crash with other riders and landing on his left side while his toes were strapped into his pedals. He presented two days after his injury with left hip pain, limited range of movement, and pain on bitrochanteric pressure. Plain x ray (Figure 3) showed an undisplaced posterior acetabular fracture. He was treated with three weeks’ bed rest, then mobilised non-weight bearing, and he made a full recovery.

‘Gilmore’s groin’—or is it?

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Groin injuries are a common and often difficult diagnostic problem. This paper reviews six patients presenting with symptoms highly suggestive of the syndrome ‘Gilmore’s groin’, but in whom the pathophysiology of the groin disruption and its surgical management differed from Gilmore’s description.


Keywords: groin injury; Gilmore’s groin; pathophysiology of groin disruption; surgical management

Groin injuries are common in sport and their management must be based on accurate diagnosis. This is difficult, as symptoms and signs are often diffuse and non-specific. Many patients undergo lengthy periods of conservative management and numerous radiological investigations before surgical intervention is contemplated.

A syndrome of groin disruption has been described as ‘Gilmore’s groin’. Patients present with chronic groin pain which is aggravated by sudden and twisting movements and, in particular, by the action of kicking a ball, coughing and even sneezing; even rolling over in bed may be enough to exacerbate symptoms. Few patients recall an actual ‘event’ or moment when the injury was first sustained. Other authors have used the terms ‘pubalgia’, ‘groin disruption’, and ‘the sportsman’s hernia’ to describe the syndrome.

Gilmore’s description includes a lack of visible external signs in the affected groin, dilatation of the superficial inguinal ring (felt by inversion of the scrotum with the little finger tip), a cough impulse, and marked tenderness on the affected side, although he does not specify the anatomical site of this tenderness.

Discussion

We believe these cases provide three important messages. Firstly, cyclists who are attached to their pedals by straps or clips are likely to tumble with their bicycle and fall directly onto one or other hip, thus sustaining this kind of injury to the pelvis. Secondly, they may present days later with mild symptoms but should have x ray pictures to exclude this type of fracture. Thirdly, it is easy to miss such fractures on plain views and it could be argued that cyclists who sustain direct blows to the hips, or who present with hip pain following a fall, should have oblique views of the pelvis to exclude the presence of a fracture and thus avoid the problems that may ensue if they are not treated correctly.

Patients

All complained of chronic groin pain exacerbated by sudden sharp movements, especially when kicking. Patient 1 also complained of pain in the groin when rolling over in bed. In all patients, tenderness was elicited just above the deep inguinal ring, but no dilatation of the superficial inguinal ring was noted and no cough impulse or hernia was identified.

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Discussion and pathophysiology

Gilmore describes the pathophysiology of the groin disruption as being caused by a number of combined factors: (1) a torn external oblique aponeurosis causing dilatation of the superficial inguinal ring; (2) a torn conjoined tendon; (3) dehiscence between the inguinal ligament and the torn conjoined tendon, constituting the major injury.
Table 1. Summary of patient's symptoms, signs and investigations

<table>
<thead>
<tr>
<th>Patient number</th>
<th>Site of pain</th>
<th>Sport</th>
<th>Duration of symptoms (months)</th>
<th>Investigations and previous treatment</th>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left groin</td>
<td>Soccer (midfield)</td>
<td>8</td>
<td>Physiotherapy, no investigations</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Right groin</td>
<td>Soccer (midfield)</td>
<td>3</td>
<td>Physiotherapy, prolonged rest</td>
<td>27</td>
</tr>
<tr>
<td>3</td>
<td>Right groin</td>
<td>Soccer (midfield)</td>
<td>6</td>
<td>Physiotherapy, normal pelvic x ray</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>Right groin</td>
<td>Rugby (full back)</td>
<td>8</td>
<td>Physiotherapy, orthopaedic consultation, no other investigations</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>B/L pain (right more than left)*</td>
<td>Soccer (midfield)</td>
<td>6</td>
<td>Physiotherapy</td>
<td>29</td>
</tr>
<tr>
<td>6</td>
<td>Right groin pain</td>
<td>Cricket (bowler)</td>
<td>8</td>
<td>Previous physiotherapy, acupuncture</td>
<td>30</td>
</tr>
</tbody>
</table>

Figure 1.

He describes surgical restoration of this disruption by way of a modified herniorrhaphy with plication of the transversalis fascia and vicryl repair to the conjoined tendon. A nylon darn is performed to approximate the repaired conjoined tendon to the inguinal ligament. The external oblique is then repaired and the wound closed in layers.

There seems little doubt that Gilmore has highlighted a number of symptoms and signs peculiar to one form of groin disruption and that he has had good results from his surgical management. The patients presented in this paper had many of the symptoms described by Gilmore and others. We agree that there was no clinical evidence of a hernia, and that there is an area of localized tenderness in the groin. This area we believe to be superior to the deep inguinal ring. However, we have not found a cough impulse or a dilated superficial inguinal ring on digital scrotal inversion. Like Gilmore's patients, those presented here had undergone lengthy periods of varying conservative management regimes, including physiotherapy, rest, and acupuncture.

In our experience, the anatomy and pathophysiology of the groin disruption is not as complex as Gilmore describes and we believe that surgical correction can be performed by a much simpler approach. In the patients presented, the major disruption seen was a small tear in the external oblique aponeurosis at the site of emergence of the small neurovascular bundle associated with...
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Figure 2.

The tear is revealed by a routine inguinal incision and blunt dissection onto the external oblique aponeurosis. In all papers reviewed we could find no specific mention of such disruption, although reference to 'microscopic tears' or 'avulsions' have been made. We found no surgical evidence of herniae, or indeed of a bulge in the posterior wall of the inguinal canal as described by Malycha and Lovell.4

We have shown that approximation of the torn edges of the external oblique aponeurosis with simple interrupted nylon leads to a return to full sporting activity within 5 to 6 weeks. It is interesting to note that in the 'modified herniorrhaphies' described in previous reports, a repair of the external oblique aponeurosis is always made, and perhaps this explains the similarity in results with either technique.

Groin strain is a common complaint, particularly in soccer players, and we suggest that many of these patients would benefit from earlier groin exploration and accurate identification of the pathophysiology. We believe this to be a tear in the external oblique; in our small series we have not noted disruption of the conjoint tendon.

References
1 Gilmore OJA. Gilmore's groin. Sportsmedicine and Soft Tissue Trauma 1992; 3 (3).

Wild water rapid burns

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Swimming pool water slides are becoming increasingly long and adventurous. This case report and survey suggest that they may carry with them a notable risk of friction burns.

Keywords: friction; burns; swimming pool

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