

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.

## 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.

# '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.**

(*Br J Sports Med* 1995; 29: 206–208)

**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'.<sup>1</sup> 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',<sup>2</sup> 'groin disruption',<sup>3</sup> and 'the sportsman's hernia'<sup>4</sup> 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.

We report a series of patients who presented with symptoms and signs highly suggestive of 'Gilmore's groin', but in whom the pathophysiology of the groin disruption and its surgical management differed from Gilmore's description.

## 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.

All patients claimed relief of symptoms following operation. In patient 1 relief was virtually instantaneous on waking from his general anaesthetic. Patient 5 underwent bilateral groin exploration and repair. All patients returned to full active participation in their chosen sport within 6 weeks of operation.

Follow up at 6 weeks revealed no further pain. Only one patient has since suffered further pain (patient 5) and this was from a new adductor origin strain.

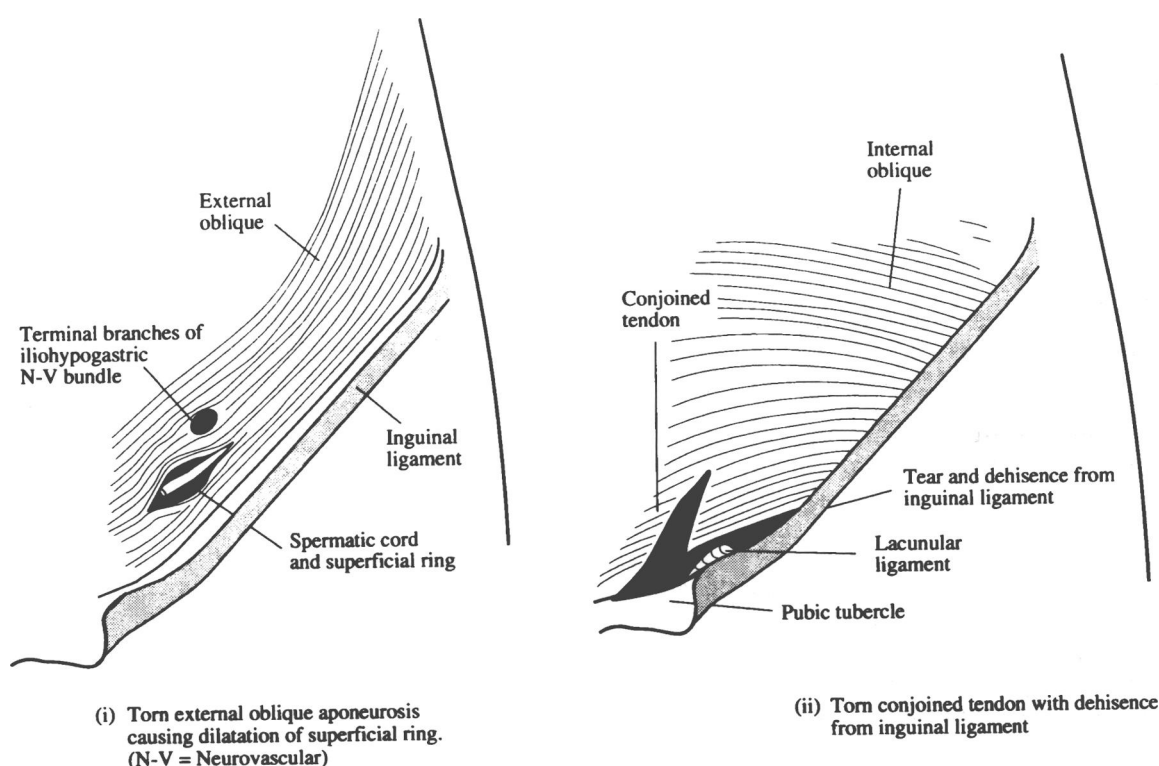
## Discussion and pathophysiology

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 conjoint tendon; (3) dehiscence between the inguinal ligament and the torn conjoint tendon, constituting the major injury.

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**Table 1.** Summary of patient's symptoms, signs and investigations

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

**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 conjoint tendon. A nylon darn is performed to approximate the repaired conjoint 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.<sup>1-4</sup> 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

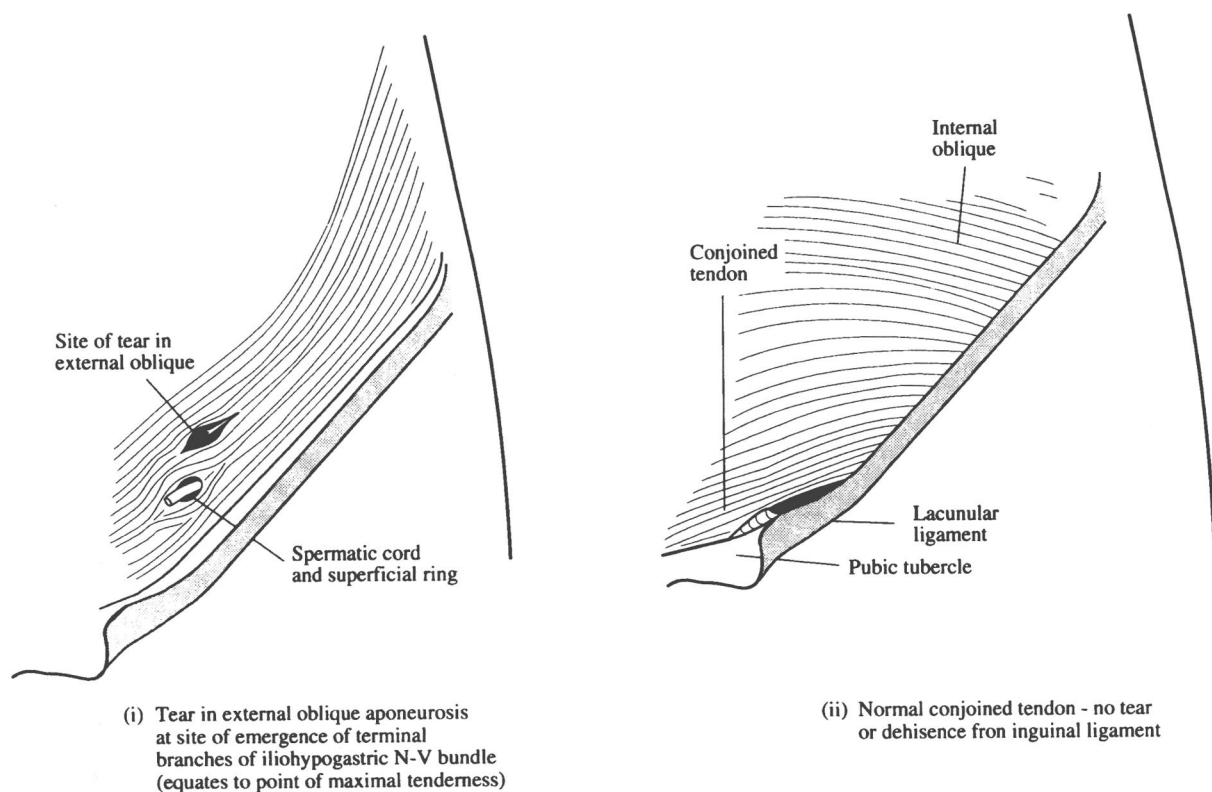


Figure 2.

the terminal branches of the anterior primary ramus of the iliohypogastric nerve (see *Figures 1 and 2* for comparison of 'Gilmore's groin' and the author's description).

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.<sup>2</sup> 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.<sup>4</sup>

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

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# Wild water rapid burns

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Swimming pool water slides are becoming increasingly long and adventurous. This case report and survey suggest

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that they may carry with them a notable risk of friction burns.

(*Br J Sports Med* 1995; 29: 209-210)

**Keywords:** friction; burns; swimming pool