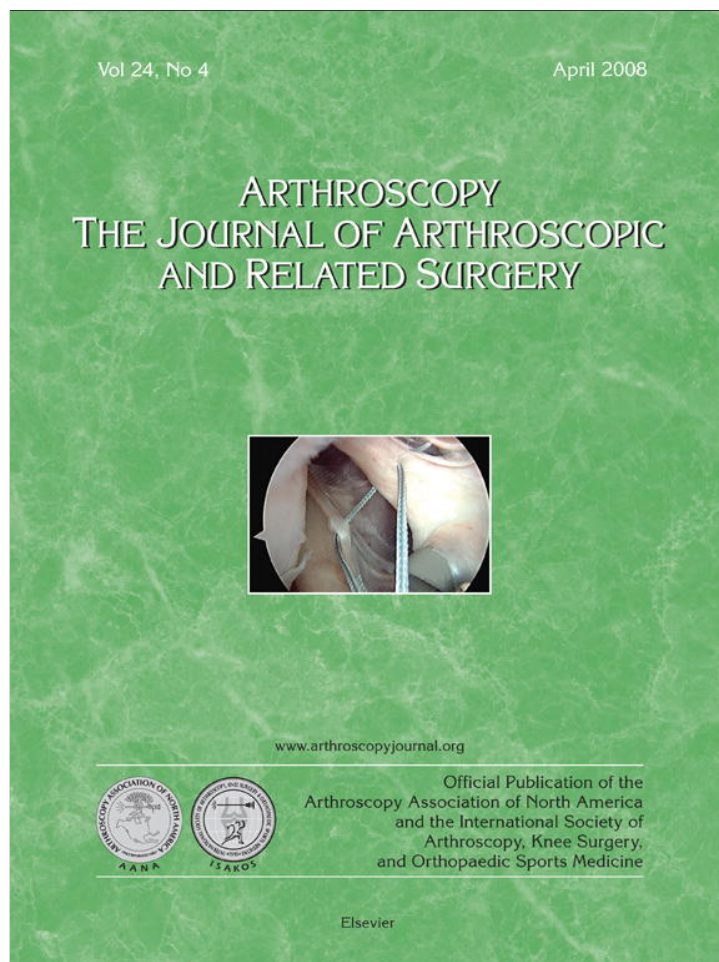


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## Case Report

## Supermarket Hip: An Unusual Cause of Injury to the Hip Joint

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**Abstract:** Sporting activity can be a significant cause of injury to the hip joint, in particular tears of the acetabular labrum and, less commonly, tears of the ligamentum teres. Femoroacetabular impingement and acetabular dysplasia are also commonly associated with labral tears. However, shopping in a supermarket would not normally be regarded as an at-risk activity for the hip joint. Despite this, we report 3 separate cases of hip injury (2 labral tears, 1 partial avulsion of the ligamentum teres), each of which was sustained while shopping in a supermarket. None of the 3 patients involved had radiographic evidence of acetabular dysplasia or arthroscopic evidence of femoroacetabular impingement. All patients were successfully treated by arthroscopic surgery of the hip. We therefore suggest that shopping in a supermarket may need to be reclassified as an at-risk activity for the hip joint. **Key Words:** Arthroscopy—Hip injury—Labrum—Ligamentum teres.

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**H**ip arthroscopy has provided much new knowledge about injuries to the hip joint, particularly in respect of the torn acetabular labrum. Although injuries to the labrum or ligamentum teres can occur from many different causes, including acetabular dysplasia and impingement, there is also an apparent association with sporting activities and trauma.<sup>1-3</sup> A number of high-profile athletic individuals have undergone surgery for these injuries in various locations throughout the world. Byrd and Jones<sup>4</sup> investigated the 2-year results of hip arthroscopy performed on a consecutive series of 35 patients for a variety of disorders and reported that labral tears, chondral damage, and rupture of the ligamentum teres were the major lesions inside the hip. Because of this information, athletes between 30 and 40 years of age have been

highlighted as major candidates for hip arthroscopic surgery.<sup>5-7</sup> The nature of the injury that can affect the integrity of either the acetabular labrum or ligamentum teres is also diverse, and includes major trauma such as a road traffic accident,<sup>7</sup> falling from a height,<sup>8</sup> sporting activities,<sup>7</sup> and lifting a heavy object.<sup>9</sup> However, the activity of shopping in a supermarket has not, to date, been associated with a recognized risk to the hip joint. We present 3 patients who sustained injuries to their hip while shopping in a supermarket and we believe this is the first report in the literature of the dangers of this activity to the integrity of the human hip.

Two women (aged 51 and 49 years) and 1 man (aged 36 years) each sustained an injury while shopping in a supermarket. Plain radiographs and magnetic resonance imaging (MRI) views of the injured hip were available for all patients. Hip arthroscopy was conducted in the supine position by the standard 3-portal method of Byrd<sup>10</sup> for the 2 women (cases 1 and 2), but in the lateral position for the 1 man (case 3) using the method described by Khanduja and Villar.<sup>1</sup> The peripheral compartment was inspected in each patient, using the method described by Kelly and Philippon.<sup>2</sup>

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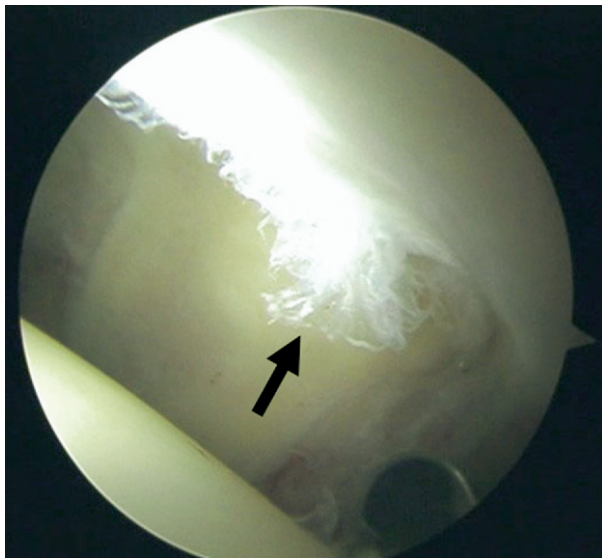
## CASE REPORTS

### Case 1

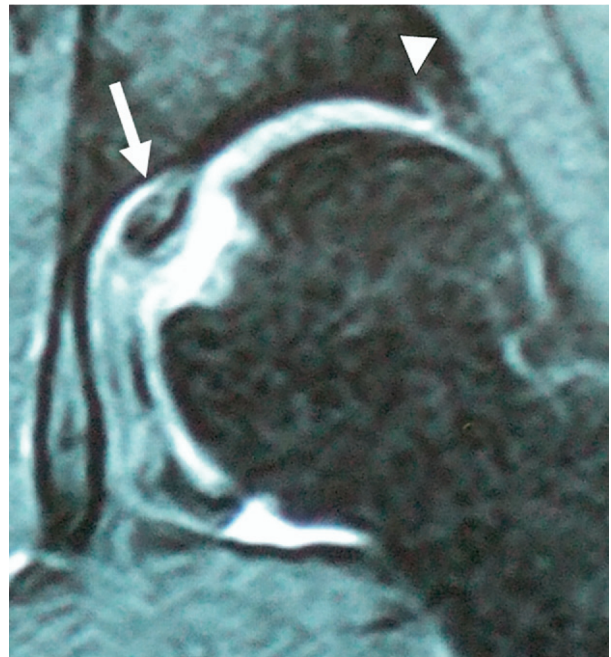
A 51-year-old woman was in a crouching position while taking a box of detergent from the lowest shelf of a supermarket. The moment she stood up from this position, she felt severe pain in her left groin. She attended hospital 10 days after the injury because her pain had not subsided. At the initial examination, she was limping, while her C-sign,<sup>11</sup> log-rolling sign,<sup>11</sup> and Patrick sign (Faber sign) were positive. Plain radiographs showed no abnormality but MRI showed high signal intensity on the T2 images in her left hip joint, suggesting an effusion within the hip. Arthroscopy was performed 7 days after the patient's initial visit to our hospital and showed detachment of the anterosuperior portion of the acetabular labrum (Fig 1). There was no evidence of an impingement lesion within the peripheral compartment. Arthroscopic partial acetabular labrectomy was performed and resulted in complete pain relief.

### Case 2

A 49-year-old woman was taking some items from a high supermarket shelf while her shopping basket remained on the floor. After she put the items in her basket, she grasped its handle and tried to lift it. The moment she did this, she felt moderate pain in her left



**FIGURE 1.** Supermarket hip: Arthroscopic finding of a labral tear (case 1). Arthroscopic view is through a lateral portal depicting an avulsion of the labral margin (arrow). There is no degeneration of the articular cartilage of either the acetabulum or femoral head.

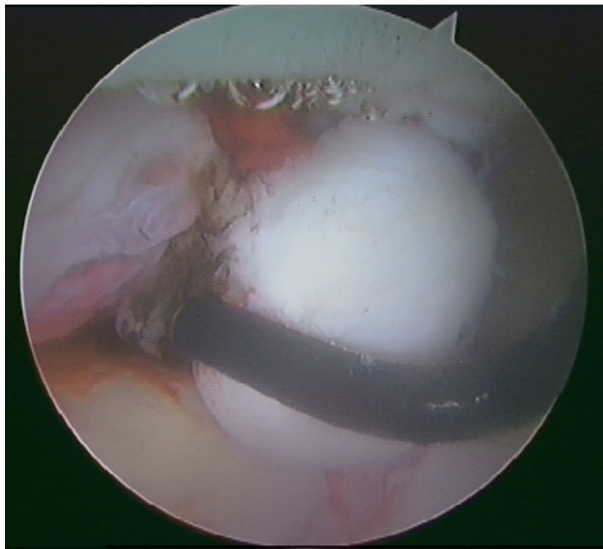


**FIGURE 2.** Supermarket hip: Magnetic resonance imaging scan (case 3) identified a loose body in the left hip joint (arrow). The counterpart of the loose body suggested avulsion fracture of the ligamentum teres at the insertion to femoral head. High-intensity line (arrowhead) on the base of labrum suggested a labral tear. However, arthroscopic findings did not identify a labral tear.

groin. She attended hospital 2 days after the injury. At the initial examination, she showed a moderate limp and a positive C-sign,<sup>11</sup> Patrick sign, and impingement sign.<sup>12</sup> Plain radiography and MRI failed to identify any abnormality. After 6 weeks of conservative treatment (crutches, nonsteroidal anti-inflammatory drugs, and physiotherapy), the patient's hip pain persisted. Consequently, arthroscopy was performed 8 weeks after the injury and identified a detachment of the labrum from the anterosuperior portion of the acetabulum. There was no evidence of an impingement lesion within the peripheral compartment. An arthroscopic partial acetabular labrectomy was performed, and the pain settled.

### Case 3

A 36-year-old man was pushing a trolley in a straight line along the aisle of a supermarket. He quickly turned right, remembering that he was going to buy fish, and developed immediate left groin pain and, thereafter, episodic, acute locking of the hip joint. After a visit to his orthopaedic surgeon, plain radiographs, computed tomography, and MRI findings identified a loose body in his left hip joint (Fig 2).



**FIGURE 3.** Supermarket hip: Loose body (case 3). Arthroscopic view is through a 70° arthroscope of case 3 (left hip). A radiofrequency probe was used to detach the loose osteochondral fragment from the ligamentum teres. The fovea is also seen.

Consequently, the patient was referred to our institution to undergo hip arthroscopy. This identified a partial avulsion of the ligamentum teres from its foveal insertion, the loose body being an osteochondral fragment which had been avulsed from the fovea (Fig 3). There was no evidence of an impingement lesion within the peripheral compartment. The osteochondral fragment was removed arthroscopically and, by the 3-month postoperative review, the patient reported no further episodes of locking and had complete pain relief.

## DISCUSSION

A torn acetabular labrum is a common hip injury; a torn ligamentum teres is less common. Given the normal hip structural anatomy, an acute tear of the labrum is considered to be caused by a twisting injury during sporting activities or by trauma.<sup>4-7</sup> In contrast, the more frequent labral tear with an insidious onset normally develops in a hip with some form of bony structural abnormality, such as dysplasia or femoro-acetabular impingement,<sup>13,14</sup> although the labral tear itself may still be initiated by sporting activity.<sup>7</sup> The torn labrum is slightly more common in women,<sup>5,6</sup> with 87% of hips that develop a labral tear also showing abnormalities of bone structure.<sup>13</sup>

However, our 2 patients with labral tears sustained in a supermarket (cases 1 and 2) had no evidence of

hip abnormalities on their plain radiographs or MRI scans. Both patients were women and both were slightly older than normal for a traumatic labral tear.<sup>5,6,9</sup> In addition, both had made sudden movements on the affected hip, perhaps with a rotational component, but there was certainly no sporting element to their injury.

These factors suggest that the aging process may predispose an individual to a labral tear. Lecouvet et al.<sup>15</sup> and Cotton et al.<sup>16</sup> reported the MRI findings of the acetabular labrum in asymptomatic hips and found that the frequency of degenerative change in acetabular labra increased with age. Abe et al.<sup>17</sup> also reported the MRI findings of the acetabular labrum in asymptomatic hips and concluded that the frequency of degenerative findings in the labrum significantly increased in individuals older than 40 years of age. These degenerative changes were most frequent in the anterosuperior portion of the acetabular rim.

Our cases 1 and 2 did not show any abnormality with their labra on their postinjury MRIs. Recent investigations of the use of MRI in depicting the acetabular labrum have suggested that conventional MRI has limited success in identifying a labral abnormality. High resolution and small fields of view are necessary to detect slight abnormalities of labrum on plain MRI.<sup>18</sup> It is likely that latent labral degeneration was a feature of cases 1 and 2, one of whom was aged 49 years and the other was aged 51 years. This labral degeneration may have weakened the labral tissue sufficiently so that a minor injury resulted in a labral tear.

In contrast, case 3 did not have a labral tear but sustained an osteochondral lesion and partial avulsion of the ligamentum teres while pushing a trolley in a supermarket. Chondral lesions in the hip can be seen in association with 70% of labral tears.<sup>19</sup> Acute chondral lesions usually follow trauma. Byrd<sup>20</sup> reported that a direct blow to the greater trochanter was a common mechanism for acute articular fragmentation. This was not a feature of case 3. The ligamentum teres tightens as the extended hip externally rotates. We suspect that as the patient rotated his supermarket trolley to the right, his left foot remained on the floor, externally rotating the left hip joint as the patient twisted. Although Delcamp et al.<sup>8</sup> described hyperabduction as a mechanism of rupture, Byrd and Jones<sup>21</sup> reported 23 patients with traumatic rupture of the ligamentum teres. Fifteen of these patients sustained violent trauma, but the remaining eight sustained a twisting injury. On this basis, it is likely that case 3 sustained his ligamentum teres injury as a

consequence of twisting. According to the classification of Gray and Villar,<sup>22</sup> the arthroscopic findings were those of a type II (partial rupture) of the ligamentum teres.

It appears that significant injury can occur to the hip joint without any exposure to sporting activity. A supermarket might not normally be regarded as a location in which the hip joint is at risk. However, our 3 case reports would suggest otherwise.

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