

OSTEOCHONDRITIS DISSECANS OF THE FEMORAL HEAD IN PERTHES DISEASE : A CAUSE FOR CONCERN ?

F. STEENBRUGGE, M. F. MACNICOL¹

Osteochondritis dissecans (OCD) and loose body formation are rare following Perthes' disease. We have reviewed the literature about clinical presentation, treatment and outcome and added a further three cases of the condition. Cases mentioned in the literature were poorly documented. We feel that a thorough documentation should be carried out as soon as the diagnosis is made.

Conservative treatment should be given when the disability is moderate. The loose body should only be removed surgically when it is mobile, when it bulges into the joint space or when there are signs of early arthritis.

Keywords : osteochondritis dissecans ; loose body ; Perthes' disease.

Mots-clés : ostéochondrite disséquante ; corps étranger ; maladie de Perthes.

INTRODUCTION

Osteochondritis dissecans (OCD), a process that leads to separation of a portion of subchondral bone and overlying cartilage, most commonly involves the distal femur, distal humerus, and talus (2). When the hip is involved, the lesion usually affects the femoral head.

A review of the literature confirms that OCD of the hip in children and adolescents is uncommon.

Reports consist of a few cases (12, 17, 21, 22), single cases (3, 5, 8, 14, 19), or examples of outcome after a variety of conditions.

A number of disorders can precede OCD of the hip. All seem to disrupt the normal vascularity of the weight-bearing portion of the femoral head.

Legg-Calvé-Perthes disease (LCPD) is the most common predisposing disorder (2, 3, 4, 14, 17, 19). The condition may also be familial (19) or follow treatment of a congenital dislocation of the hip (21).

Abnormal ossification and constitutional or genetic predisposition have been suggested, but not proved, to be possible etiologic factors. Trauma has been implicated, yet in most cases there is no underlying or associated abnormality (2, 5, 8, 12).

Treatment may either be conservative or operative, with resection of the sequestrum. Arthroscopy of the hip may allow a selective and atraumatic removal of loose bodies, but the outcome has not been well documented (18).

MATERIAL AND METHODS

We reviewed 10 papers (7, 9, 10, 12, 13, 15, 17, 18, 21, 22), published over the past 30 years, comparing the findings and results with our small series of three patients. A total of 50 patients with OCD of the femoral head following Perthes' disease included four patients with bilateral Perthes' disease and one patient with bilateral OCD. The age of the patient at the onset of symptoms, evolution, investigations and imaging, treatment

Department of Orthopedic Surgery, Algemeen Stedelijk Ziekenhuis, Campus Aalst, B-9300 Aalst, Belgium.

¹ Department of Pediatric Orthopedics, Royal Hospital for Sick Children, Sciennes Road, Edinburgh, EH9 1LF, Edinburgh, Scotland, UK.

Correspondence and reprints : F. Steenbrugge, Department of Orthopedic Surgery and Trauma, ASZ-Aalst, Merestraat 80, B-9300 Aalst, Belgium. E-mail : fsteenbr@belgacom.net.

and outcome were analysed for the whole group. Our aim was to see if there was any difference in the outcome in those cases diagnosed at an early age or late in childhood, and to see if there was any difference between those cases treated conservatively or operatively. We added a further three cases of the condition. We then matched these findings with the results of our series.

Only three papers mentioned the gender of the patient : 29 boys and 6 girls were affected by loose body formation (18, 20, 22).

The average age of the patients when the diagnosis of LCPD was made was 8 years, ranging from 4 to 11 years. No paper mentioned the time interval between the diagnosis of LCPD and the onset of symptoms secondary to OCD. One paper described the frequency of the combination of LCPD and OCD to be as high as 6%, but did not mention its source (15).

The most common presenting complaints were limp, aching pain, catching, episodic symptoms and instability (22). Intermittent symptoms were frequently well documented : asymptomatic periods of several months alternating with frequent spells of painful "catching" in the hip lasting weeks to months. Over time, the episodes became either more frequent leading to surgical intervention or less frequent. Instability was also experienced, the patient describing sudden pain and giving way of the hip. This was regarded as a pain inhibition response, similar to pseudolocking of the knee seen with chondromalacia patellae or OCD of the distal femur, rather than true subluxation or dislocation. The most common presenting signs were leg length discrepancy (with the involved femur always shorter), limited internal rotation, painful flexion-adduction of the hip and limp (22). No paper mentioned a history of nocturnal pain.

In all patients (N = 50), anteroposterior and frog-lateral radiographs confirmed the diagnosis.

Since the radiographic diagnosis of OCD is not always easy, computed tomography or arthrography may be used to confirm the condition (18) and to assess the possible formation of a loose body. One paper suggested that the best method to visualize and diagnose OCD of the femoral head is with an anteroposterior tomogram of the hip in the neutral position (22). Two papers mentioned the use of magnetic resonance imaging (MRI) to make the diagnosis (10, 11, 22). T2-weighted images showed a band of increased signal intensity around the fragment, probably indicating a loose fragment although the hip joint might well be asymptomatic. Radioisotope bone scan was not

described as useful. Radiographic presentation revealed all lesions to be well-localized to the superolateral or superior central regions of the femoral head, which are the sites of known maximal contact force.

Only one paper used the Salter and Stulberg classification to categorize the patient when the diagnosis of OCD was made. The patient was classified as a Salter Group A and Stulberg Type 2.

No other paper used these or the Herring classification to categorize the patients at the time of diagnosis or at any time at follow-up.

RESULTS

Thirty seven out of 50 patients in the literature were treated conservatively, but most papers reported only a very short or incomplete follow-up. Conservative treatment consisted of bed rest, crutches and analgesia. One paper mentioned the use of a Thomas splint for an average of two years.

The average follow-up in this paper was 24 years and three out of 17 patients remained relatively free of symptoms despite loose body formation and osteoarthritis (15).

None of the other papers described the long-term outcome.

Surgical treatment was carried out in 13 patients : arthrotomy in 6 cases (22) and arthroscopy in 7 cases (18).

The time from the onset of symptoms to surgery averaged 6 years in the first paper and the age at surgical exploration averaged 20 years (22). An arthrotomy with dislocation of the femoral head in five patients allowed excision of the fragment and drilling of the crater. In one case the fragment was elevated, the crater bone grafted and the fragment fixed with a Herbert screw. The average follow-up after surgery was 10 years. No patients appeared to suffer from the temporary femoral head dislocation and excision of the OCD fragment. All cases functioned normally during the time of follow-up. The patient with the Herbert screw experienced mild pain.

The average age of the patients that underwent arthroscopy was 16 years (18).

Nothing is mentioned about the time delay between onset of symptoms and arthroscopy although the authors state that it was recorded

preoperatively. All arthroscopies were therapeutic. In 5 cases a loose body was removed, although the procedure was repeated in one case because of the lack of uniquely curved instruments. The two remaining cases showed the presence of a loose body on xray but the articular surface was intact when visualized with the arthroscope. There were no postoperative complications. The average follow-up was 2 years 10 months, and in six out of the seven patients the symptoms were reduced. The long-term outcome compared to open surgery is unknown.

Our series consisted of three cases. The first case is a boy diagnosed with Perthes' disease of the left hip at the age of 8 years. He went on to a Catterall stage III and a Herring stage C. At 18 years he developed symptoms of pain and catching. Xray and MRI confirmed the diagnosis of osteochondritis dissecans (fig. 1). Three years had elapsed between the end of the evolution of the Perthes' disease and the onset of OCD. He was treated conservatively for 2 years by means of rest and anti-inflammatory medication. The femoral head healed with the loose body still in place, leaving a Stulberg Type 3 hip which is intermittently symptomatic four years later.

The second case is a girl who developed Perthes' disease of the right hip when she was 6 years old. She went on to a Catterall stage III and a Herring stage B. At 16 years of age, four and a half years after her last review, she developed symptoms of



Fig. 1. — AP view of both hips. The left hip shows a loose body following Perthes' disease.

catching. Xrays showed OCD of the femoral head. She has been treated conservatively for 5 years as the OCD fragment has remained in place (Stulberg type 4) and the symptoms have settled down over the last 3 years.

The third case is a boy diagnosed with Perthes' disease of the left hip at the age of 5 years. He went on to a Catterall stage II or a Herring stage B. At 15 years, 5 years after the end of the evolution of his Perthes' disease, he developed symptoms of catching, limping and pain. Xrays and arthrography confirmed the diagnosis of OCD. He was treated conservatively for 4 years and the Perthes' disease has healed with the loose body still in place. At that stage, the xrays showed a Stulberg Type 3 hip. At the age of 24 years he still has a limp and his left hip aches occasionally.

The mean age at which Perthes was diagnosed was 6 years 6 months (range 5 years to 8 yrs.).

Two patients developed a Herring stage B and one stage C. The mean age at which they developed OCD was 16 years (range 15 years to 18 years). This was on average 4 years after the Perthes had settled down (range 3 years to 5 years.).

Catching and limping were the most important signs and in all cases the diagnosis was made by xrays. All patients were treated conservatively by means of rest. No splints were applied. This resulted in a satisfactory outcome in all cases. No patients showed signs of early arthritis on xray at final follow-up.

DISCUSSION

Many authors have suggested that the younger the child affected by LCPD, the better the prognosis because the child has a less severe disease and the period of time remaining for the repair, regeneration and remodelling of the hip joint is obviously longer than in the case of the older child. While this overall viewpoint is largely correct, there are undoubtedly some very young children with LCPD who, surprisingly, achieve only an indifferent result (9).

Legg-Calvé-Perthes disease occurs approximately 4 times more often in boys than in girls; however, most authors agree that the girls have a

poorer prognosis. This may be because, age for age, the girls tend to be more severely affected. In addition, a girl is likely to be skeletally more mature than the boy of the same age and, in effect, has a shorter period of time for growth and remodelling of the hip joint before final skeletal maturity is attained.

From the data reviewed it is impossible to conclude how many patients with Perthes' disease will eventually develop OCD.

The most common symptoms and signs include mild length discrepancy, catching, decreased internal rotation and limp. This was also demonstrated in our series.

An anteroposterior tomogram of the hip in neutral position, MR scanning or an arthrogram may be of value in determining whether the lesion is separating.

Nothing can be said about the delay between the onset of LCPD and the diagnosis of OCD, since the data in the literature are inadequate. We found a delay of 4 years on average in our series. At that stage 2 patients had developed a Herring stage B.

Treatment was initially directed at decreasing irritability of the hip with rest and anti-inflammatory medication.

Long-term results were reasonably satisfactory following conservative management. However, incongruity of the joint surface was often seen on subsequent radiographs, and in some patients the osteochondritic focus had become depressed. Long-term results after surgery were only available for a very limited number of patients.

An arthrotomy with dislocation of the femoral head did not appear to cause any additional problems. Excision of the fragment was successful in relieving the symptoms of catching but less successful at reducing aching pain.

There were no long-term results available from the patients treated by arthroscopy, so the risk of later osteoarthritis is unknown following both conservative and operative management.

CONCLUSION

The literature about Perthes' disease complicated by OCD is inconsistent with a lack of clinical

detail and classification of the patient when the diagnosis is made.

The predominance of males, the older age of the children, the large involvement of the epiphysis in cases with deformation of the femoral head seem to be unquestionable.

The long-term outcome in patients following OCD after Perthes' disease is poorly described so that nothing can be said about the risk of developing early arthritis.

These uncertainties about the further evolution of Perthes complicated by OCD explain the discussion on what treatment to follow. Several factors need to be taken into account: the age of the patient that limits the possibilities of spontaneous repair, the severity of functional problems, the size and exact localisation of the loose body towards the joint space.

Based on our experience, it seems that conservative treatment can be proposed in cases with minor functional complaints where xrays show no signs of worsening: an intra-articular loose-body, fragmentation of the loose body or signs of arthritis.

Surgical treatment should be reserved for those cases with disabling functional complaints where initial conservative treatment has failed.

Excision of the loose body becomes inevitable when xrays show signs of evolution towards arthritis. If possible, surgery should be delayed until the proximal femoral physis is closed.

An open femoral capital physis could predispose to additional avascular necrosis, particularly if the hip is surgically dislocated. Drilling the defect across an open physis should also be avoided, especially in a young child, to avoid premature physeal closure. In most instances inspecting the site of abnormality on the femoral head and removing the OCD fragment will require dislocation of the femoral head. Arthroscopy is a very demanding technique and should be reserved for selected cases after a careful preoperative clinical and radiological assessment.

We achieved satisfactory results in our series through a conservative approach and we could not detect further deterioration of the femoral head in all cases at final follow-up.

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SAMENVATTING

F. STEENBRUGGE, M. F. MACNICOL. Osteochondritis dissecans van de femurkop in Perthes : een reden tot onrust ?

Osteochondritis dissecans (OCD) en gewrichtsmuizen zijn zeldzaam na een doorgemaakte Perthes. We bestudeerden de kliniek, de behandeling, en het eindresultaat van de in de literatuur beschreven gevallen (50) en we voegden drie eigen in detail beschreven gevallen toe. De gevallen in de literatuur zijn slecht gedocumenteerd. Wij vinden dat een grondige documentatie zou moeten gebeuren van zodra de diagnose wordt gesteld. Conservatieve behandeling kan overwogen worden als de aandoening mild is. De gewrichtsmuis dient enkel verwijderd te worden als ze mobiel is, uitpuilt in de gewrichtsruimte of als er vroege tekens van arthrose zijn.

RÉSUMÉ

F. STEENBRUGGE, M. F. MACNICOL. L'ostéochondrite disséquante dans la maladie de Legg-Calvé-Perthes.

L'ostéochondrite disséquante (OCD) est rare après une maladie de Perthes. Les auteurs ont revu la littérature concernant la présentation clinique, le traitement et les résultats des 50 cas rapportés, souvent de façon sommaire. Ils ajoutent à cette série trois cas personnels, bien documentés et suivis pendant plusieurs années. Le traitement conservateur est réservé aux cas bénins. Si le fragment est mobile ou s'il est libre dans l'articulation, ou encore s'il y a des signes d'arthrose, le fragment doit être enlevé.