Free osteochondral fragment caught in the acetabular fossa in the osteochondritis dissecans after Legg-Calvé-Perthes' disease—report of 2 cases

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Case 1

A 28-year-old man was sen in our hospital in November 1999 for a follow-up examination of his left hip, which had a residual deformity after Legg-Calvé-Perthes' disease (LCPD). His hip was classified as poor with the Mose (1980) and class III with the Stulberg and Cooperman (1981) classifications. He complained of intermittent pain and a limited range of motion in his hip, which were ascribed to the deformed femoral head. Routine radiographs, anteroposterior and frog leg lateral views, showed coxa magna with lateral flattening of the femoral head and shortening of the femoral neck. In addition, there was a linear abnormal bone density, 2 × 12 mm, in the medial joint space corresponding to the upper corner of the acetabular fossa. CT with 3-dimensional reconstruction showed that the density was due to a free fragment entrapped in the upper corner of the acetabular fossa. A review of the clinical and serial radiographic findings confirmed that the fragment had separated from the superior dome of the femoral head, which had previously had osteochondritis dissecans (OCD). The records showed that in November 1983, when he was 12 years old, he was diagnosed as having LCPD of the left hip of Catterall group III severity. He was treated with intermittent non-weight bearing. A follow-up radiograph in July 1986 showed a radiolucent area in the dome of the femoral head. In July 1988, a bone fragment with a distinct margin became visible, but on a lateral radiograph in 1990, a radiolucent defect was found, but no osseous fragment. Further follow-up in 1999 disclosed a dense streak in the upper part of the medial joint space, which later proved to be a loose body. At his last follow-up at age 30 years, January 2002, the fragment was found to have stayed in the acetabular fossa, and had not migrated or caused any symptoms.

Case 2

A 14-year-old boy was referred to our hospital on August, 1982 with a 2-year history of bilateral LCPD. The severity of his disease was Catterall group I in the right hip and group III in the left. He was treated with traction and an abduction brace for 2 years. Radiographs showed the characteristic findings of LCPD. In addition, the anteroposterior view of the right femoral head showed a crater-like depression in the bony articular surface of the superior dome. Radiographs in September 1983 revealed small ossicles in the radiolucent crater, which gradually enlarged and coalesced into a single fragment with a distinct margin. Radiographs in 1988 showed a distinct osseous fragment, 12 × 6 mm, which was partly raised from its bed. Although in 1991 the fragment had become more prominent and seemed to float over the radiolucent crater in the anteroposterior view, it rotated with the femoral head, which showed that the fragment was still attached to it. In 1999, he underwent another follow-up examination in the hospital. The plain radiographs at this time showed that the fragment had disappeared from the radiolucent crater of the femoral head and a new bone density was present in the medial joint space. To assess this density, we performed a CT with 3-dimensional reconstruction, which showed an osseous fragment fixed in the posterior part of the acetabular fossa. At his last follow-up in March 2000, the fragment was still in the fossa and had not caused any symptoms.

Discussion

Osteochondritis dissecans is an unusual late complication of LCPD. The risk of developing OCD seems to be related to late onset of LCPD. Both

Case 1. A 12-year-old boy with LCPD of the left hip.

Initial radiograph in 1983 showed Catterall group III LCPD.

2 years later, at the age of 17 years, an ossific fragment had become visible with a distinct margin.

Last follow-up, at the age of 30 years, showed a dense streak in the upper part of the medial joint space.

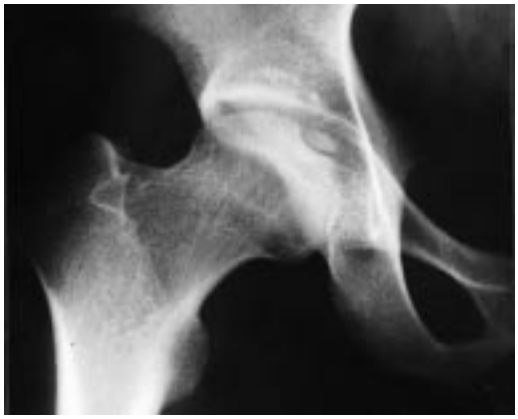
CT showed that the osseous fragment had remained in the superior portion of the acetabular fossa.

of our cases were 12 years old when the LCPD was diagnosed. In other reports, the average age at onset of LCPD was 9.3 years (Bowen et al. 1986), 8.4 years (Katz and Siffert 1979), 8 years (Österman and Lindholm 1980) and 10 years (Rowe et al. 1989). The risk of developing this complication seems to be greater in older children.

Catterall (1982) reported that the risk of OCD did not correlate with the severity of LCPD. However, Rowe et al. (1989) found that 6 of 7 cases belonged to Salter group B, which indicated a higher incidence in hips having a poor prognosis. Similarly, 9 of 15 hips, in a study by Bowen et al. (1986), belonged to Salter group B.

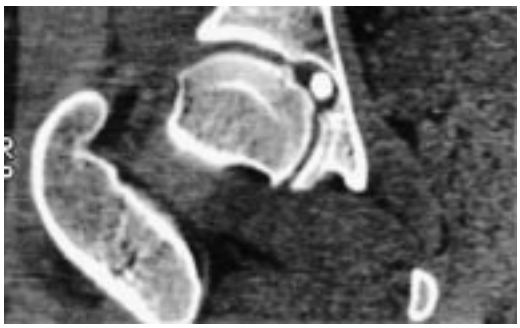
Free separation of an osteochondral fragment in OCD after LCPD has very rarely been reported. In the hip joint, the OCD fragment, almost invariably covered by intact and normal articular cartilage, is usually located on the superior aspect of the femoral head. According to King and Richards (1940), free separation of the osteochondral fragment is anatomically impossible. Reviewing the literature, we found only 4 cases of free fragment separation among 99 cases reported in 29 papers. Österman and Lindholm (1980) reported 17 patients with a combination of OCD and LCPD, which included the cases described by Edgren (1965). In 3 of these, the OCD had separated to form a loose body

Case 2. A 14-year-old boy with a 2-year history of bilateral LCPD.



At 19 years of age, an ossified nucleus had appeared at the crater, which was partly raised.

By 30 years of age, the bony fragment had moved to the medial joint space.



CT showed the isolated loose fragment entrapped in the acetabular fossa.

in the joint, which was located near the lesser trochanter and was asymptomatic. Bowen et al. (1986) reported 14 cases of OCD in a series of 465 patients treated for LCPD. In 1 of these, the osteochondral fragment had become completely displaced into the inferomedial joint space, and attached itself to a synovial fold, where it caused no symptoms. Since it did not seem to move freely in the joint, excision was not considered. Unlike in idiopathic OCD, it has been repeatedly reported that spontaneous healing occurs in OCD after LCPD. This tendency to healing also explains the rarity of loose body formation. Katz and Siffert (1979), Österman and Lindholm (1980), and Bowen et al. (1986) reported their experiences of spontaneous healing of OCD after LCPD. We (Rowe et al. 1989) have also had 7 cases of OCD in a series of 363 LCPD hips, and observed radiographic healing in 4, spontaneous healing in 3 and healing after drilling and a bone graft in 1.

The manner in which free fragments become entrapped in the acetabular fossa is unknown. From serial radiographic examinations, we suggest the following sequence. A part of the peripheral margin of the articular cartilage covering the osteochondral fragment is ruptured by normal motion of the hip joint. The ruptured part of the OCD is lifted from its bed, and this raised margin impinges against the rim of the acetabular fossa during motion of the joint. Such impingement accelerates progression of the peripheral tear and separation of the entire fragment. Even a totally separated fragment may sometimes remain in situ because of the even pressure exerted by the spherical acetabular socket. However, when a free fragment encounters the soft part of the acetabular fossa, it migrates from its bed and becomes entrapped in the acetabular fossa.

Bowen J R, Kumar V P, Joyce J J, Bowen J C. Osteochondritis dissecans following Perthes' disease. Clin Orthop 1986; 209: 49-56.

Catterall A. Legg-Calvé-Perthes disease: clinical features. Edinburgh, London, Melbourne and New York: Churchill Livingstone 1982: 34-63.

Edgren W. Coxa plana. Acta Orthop Scand (Suppl) 1965; 85.

Katz J F, Siffert R S. Osteochondritis dissecans in association with Legg-Calvé-Perthes disease. Inter Orthop (SICOT) 1979; 3: 189-98.

King D, Richards V. Osteochondritis dissecans of the hip. J Bone Joint Surg (Br) 1940; 22: 327-48.

Mose K. Methods of measuring in Legg-Calvé-Perthes' disease with special regard to the prognosis. Clin Orthop 1980; 150: 103-9.

Österman K, Lindholm T S. Osteochondritis dissecans following Perthes' disease. Clin Orthop 1980; 152: 247-54.

Rowe S M, Kim H S, Yoon T R. Osteochondritis dissecans in Perthes' disease. Report of 7 cases. Acta Orthop Scand 1989; 60: 545-7.

Stulberg S D, Cooperman D R. The natural history of Legg-Calvé-Perthes' disease. J Bone Joint Surg (Am) 1981; 63: 1095-108.