Osteochondral lesions of the talar dome in children

A 24 (7–36) year follow-up of 13 cases

Jens U Wester[1], Ib E Jensen[2], Finn Rasmussen[2], Steen Lindequist[2] and Kim Schantz[1]

13 patients who in childhood had had osteochondral lesions (OCL) of the talar dome participated in a long-term follow-up including physical examination, computed tomography (CT) and conventional radiographs. Most of the cases were caused by trauma. Conventional radiographs showed abnormal findings in 4 cases and CT in a further one. In 3 cases the primary lesion could still be seen as an osteochondral defect, and 2 had a loose body in the joint. 3 of these 5 patients had mild symptoms. We conclude that arthrosis following OCL in childhood is infrequent and recommend conservative treatment initially. In those with persisting symptoms, additional imaging evaluation with CT and MRI is recommended.

Departments of [1]Orthopedics and [2]Diagnostic Radiology, Odense University Hospital, Odense, Denmark
Correspondence: Dr. Jens Ulrik Wester, Carl Baggers Allé 43, DK-5250 Odense SV, Denmark. Tel +45–66 134216
Submitted 93-02-16. Accepted 93-08-15

Osteochondral lesion (OCL) of the talar dome is rare in children. A classification was proposed by Berndt and Harty (1959) who found that both the medial and lateral OCL of the talus could be induced by trauma; they named this lesion transchondral fracture. We have reviewed charts and radiographs in 13 cases of OCL in children, examined at follow-up as adults.

Patients and methods

During the 35 years 1955–1990, 18 children, 8 girls and 10 boys, with OCL of the talus were seen at our hospital. In the same period, 59 talar fractures in children were seen. The ages of the children with OCL were 2–14 years. In all, primary radiographs were available, including lateral, oblique and anteroposterior (AP) projections. Charts were reviewed regarding trauma, sex, associated lesions, treatment and complications. The locations of the OCL were recorded as lateral, central or medial. The OCL were classified according to Berndt and Harty (1959): Type I—compression of the subchondral trabeculae, Type II—incomplete avulsion of the osteochondral fragment, Type III—complete avulsion of the osteochondral fragment without displacement, and Type IV—complete avulsion with displacement.

The average age at the time of injury was 9 (2–14) years. There were no differences in age between the 3 types of OCL. The OCL was lateral, central and medial on the talar dome in 3, 6, and 9 cases, respectively. In 2 cases, OCL was associated with a fracture, in 1 the medial malleolus and in the other both malleoli. A history of acute trauma was recorded in 11 of the 18 patients: 4 distortions, 4 falls, 2 direct traumas and 1 traffic accident. 2 children had had pain only and no history of a trauma. In the last 5 cases, the clinical data were insufficient. 8 children were immobilized in plaster, in 4 cases an ankle support bandage was used and 2 were treated with partial weight bearing. The average bandage-time was 3 (1–6) weeks, after which progressive weight bearing to tolerance was allowed. In 4 children, information regarding the treatment was not detailed, but in all cases the treatment was conservative.

13 cases were available for follow-up 24 (7–36) years after diagnosis; 2 had died, 2 refused to participate, and 1 was pregnant and did not want to be exposed to radiation. In addition to the primary projections of the ankle joint, Brodén's (1949) projections of the subtalar joint were obtained. The CT examination included axial and coronal planes with a slice thickness of 3 mm and 3 mm spacing. The healthy foot was scanned as control. During the CT examination the ankle joint was immobilized by means of a vacuum airbag. The patients were asked about pain (none, at rest, walking, or with exercise), activities in their spare time, changes or influence in their choice of employment. A physical examination that included motion of the ankle was performed. All patients gave informed consent, according to the Helsinki II Declaration. The study was approved by the local Ethics Committee.

Analysis of variance (ANOVA) was used for comparison of the age in the 3 types of OCL.

Figure 1. A 9-year-old girl with a central Type 4 OCL on the left side.

Primary radiograph.

CT after 14 years shows a small persisting lesion. She had pain on exercise.

Results

None of the cases had swelling or limited motion of the talocrural or subtalar joint, and 8 out of 13 cases had normal clinical and radiographic findings. In 5, CT was abnormal, and in 4 of these the abnormalities were also seen at radiography. In 3 cases the primary OCL could be seen as an osteochondral defect on the CT scan; in 2 of these the defects were visible on the conventional radiographs. 2 cases had loose bodies in the ankle joint, with one located medially in accordance with the primary OCL, and the other on the lateral side of the ankle joint, whereas the primary OCL was medial. In both cases the primary OCL had healed.

2 of 3 cases with persisting OCL had clicking or locking of the affected ankle joint and pain on exercise, and 1 of the cases with a loose body had exercise pain. The clinical symptoms had been present since the primary injury. Only 1 of the 5 cases with radiographic changes at follow-up had had to change his spare time habits, and in none of the cases had the lesion affected the choice of education.

Discussion

The etiology of OCL or osteochondritis dissecans remains controversial with 2 main theories: trauma and ischemia. Today many authors believe that the most important etiology is trauma (Berndt and Harty 1959, Canale and Belding 1980, O'Farrell and Costello 1982, Flick and Gould 1985, Baker et al. 1986), which is in accordance with our chart review. Berndt and Harty (1959) were able to reproduce medial and lateral OCL in cadaver studies. Lateral OCL was produced by strong inversion force to a dorsiflexed foot. Medial OCL was produced by strong inversion force to a plantarflexed foot, and lateral rotation of the tibia.

None of our cases had developed arthrosis. The CT scan gave us additional information in 1 patient who had only a persistent defect after a Type 3 OCL, located medially, where the conventional radiographs were normal. Contrary to Zinman et al. (1988), we do not feel that CT is obligatory in the follow-up examination of OCL in children. The long-term result indicates that initial conservative treatment of OCL in children often is an adequate treatment.

If the adult patient has symptoms after 6 months, MRI or CT should be considered and an operation performed (Heare et al. 1988, Zinman et al. 1988, Davies and Cassar-Pullicino 1989). The reasons for these additional imaging examinations are visualization of an inverted OCL (Kenny 1981), subarticular cysts, and the exact location and extension of the OCL (Davies and Cassar-Pullicino 1989, Nelson et al. 1990, Dipaola et al. 1991). These considerations are based on the experience in adult patients with OCL. The suggestions can probably be extended to the few children with persisting symptoms after conservative treatment of OCL.

References

Baker C L, Andrews J R, Ryan J B. Arthroscopic treatment of transchondral talar dome fractures. Arthroscopy 1986; 2 (2): 82–7.

Berndt A L, Harty M. Transchondral fractures (osteochondritis dissecans) of the talus. J Bone Joint Surg (Am) 1959; 41: 988–1020.

Brodén B. Roentgen examination of the subtaloid joint in fractures of the calcaneus. Acta Radiol 1949; 31: 85–91.

Canale S T, Belding R H. Osteochondral lesions of the talus. J Bone Joint Surg (Am) 1980; 62 (1): 97–102.

Davies A M, Cassar-Pullicino V N. Demonstration of osteochondritis dissecans of the talus by coronal computed tomographic arthrography. Br J Radiol 1989; 62 (744): 1050–5.

Dipaola J D, Nelson D W, Colville M R. Characterizing osteochondral lesions by magnetic resonance imaging. Arthroscopy 1991; 7 (1): 101–4.

Flick A B, Gould N. Osteochondritis dissecans of the talus (transchondral fractures of the talus): review of the literature and new surgical approach for medial dome lesions. Foot Ankle 1985; 5 (4): 165–85.

Heare M M, Gillespy T 3d, Bittar E S. Direct coronal computed tomography arthrography of osteochondritis dissecans of the talus. Skeletal Radiol 1988; 17 (3): 187–9.

Kenny C H. Inverted osteochondral fracture of the talus diagnosed by tomography. A case report. J Bone Joint Surg (Am) 1981; 63 (6): 1020–2.

Nelson D W, DiPaola J, Colville M, Schmidgall J. Osteochondritis dissecans of the talus and knee: prospective comparison of MR and arthroscopic classifications. J Comput Assist Tomogr 1990; 14 (5): 804–8.

O'Farrell T A, Costello B G. Osteochondritis dissecans of the talus. The late results of surgical treatment. J Bone Joint Surg (Br) 1982; 64 (4): 494–7.

Zinman C, Wolfson N, Reis N D. Osteochondritis dissecans of the dome of the talus. Computed tomography scanning in diagnosis and follow-up. J Bone Joint Surg (Am) 1988; 70 (7): 1017–9.