Osteochondritis dissecans of the knee in identical twins: a report of two cases

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ABSTRACT
We report the second case of osteochondritis dissecans (OCD) of the knee in identical twins (bilaterally in one and unilaterally in the other). Fixations with bio-absorbable pins, cylindrical osteochondral graft, and osteochondral mosaicplasty were all successful and bone union was achieved. We considered that genetic factors remain essential even if other factors (particularly repetitive trauma) are mainly responsible for the occurrence of OCD.

Key words: etiology; knee; osteochondritis dissecans; twins, monozygotic

INTRODUCTION
Osteochondritis dissecans (OCD) affects mainly the knee, ankle, and elbow joints, in which articular cartilage and associated bone become partially or totally detached to form joint loose bodies. Its aetiology is unclear; various theories have been proposed: inflammation, genetics, ischaemia, ossification, and repetitive trauma. We report OCD of the knee in identical twins (bilaterally in one and unilaterally in the other).

CASE REPORTS
Patient 1
In August 2001, an 18-year-old man presented with a 3-year history of pain in his right knee. He had no history of major knee injury. He had played basketball for 6 years in high school. Radiographs revealed OCD in both knees and a loose body in the right one (Fig. 1). Magnetic resonance imaging depicted hypointense signals on T1-weighted images and hyperintense signals on T2-weighted images. Arthroscopy revealed a detached osteochondral fragment in the medial compartment of the right knee. The fragment was removed, refreshed, and fixed using bio-absorbable pins. Bone union was confirmed 10 weeks later with radiographs. Two years later, he had a sudden onset of
severe pain in his left knee. A partially detached OCD fragment was fixed with a cylindrical osteochondral graft. Bone union was confirmed 6 weeks later by 3-dimensional computed tomography.

**Patient 2**

In June 2003, a 20-year-old man (the identical twin of patient 1) presented with a sudden onset of pain in the left knee on complete knee flexion. He had no history of major knee injury but had an 8-year history of slight pain. He had played basketball for 3 years in high school. Radiographs revealed OCD of the left knee (Fig. 2). Magnetic resonance imaging depicted hypointense signals on T1-weighted images and hyperintense signals on T2-weighted images. Arthroscopy revealed a detached osteochondral fragment (Fig. 2). As the cartilage surface was moderately damaged, the fragment was removed and osteochondral mosaicplasty was performed. Bone union was confirmed 8 weeks later by 3-dimensional computed tomography. No OCD were noted in his right knee.

**DISCUSSION**

The aetiology of OCD is still unclear; various theories have been proposed: inflammation, genetics, ischaemia, ossification, and repetitive trauma. The aetiology can be multifactorial and related to trauma in specific and susceptible locations. The repetitive trauma theory is widely accepted. The genetic theory is also supported, as a high percentage members of the same family are found to have OCD of the knee. However, in a clinical and radiological study of 34 patients with OCD and their 86 first-degree relatives, only one relative had OCD. The common form of OCD is not familial. However, OCD of bilateral medial femoral condyles in identical twin brothers has been reported. Genetic factors are considered to affect
the structural integrity and pathophysiology of OCD. Large twin studies confirmed the influence of genetic factors on cartilage and subchondral bone pathologies and suggested that an underlying congenital predisposition may play a role. Here we report another pair of identical twins with OCD of the knees. The prevalence of OCD is 15 to 21 per 100 000 knees in certain defined populations, but it may be much less. We consider that genetic factors remain essential even if other theories (particularly repetitive trauma) are mainly responsible for the occurrence of OCD.

REFERENCES