Tophaceous gout in the bipartite patella with intra-osseous and intra-articular lesions: A case report

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ABSTRACT

We report a case of a 34-year-old man who had an acute gouty attack with tophi around the accessory bone of the bipartite patella with intra-osseous lesions. As the symptoms did not respond to conservative treatments, the patient was treated surgically. Arthroscopy revealed urate crystals surrounded by inflammatory synovitis on the surface of the bipartite patella. Arthrotomy exposed the abundant crystals around the accessory bone and in the intra-osseous lesion. These findings made us speculate that some pre-existing inflammatory conditions around the accessory bone induced deposition of urate crystals, and the destruction of the barrier between the deposits and the joint led to an acute arthritis. Curettage of the tophi resulted in immediate improvement of knee function.

There had been no recurrence of symptoms at the 2-year follow-up.

Key words: gout; patella; uric acid

CASE REPORT

A 34-year-old man, who worked as a monk, had a partite patella of his right knee since primary school. He had felt occasional pain in his right knee while sitting in a lotus position for Buddhist ceremonies. He had a history of gouty attacks involving his first metatarsophalangeal joint of the right foot in 1999 and his right medial malleolus region in 2001. He was diagnosed with gout after laboratory tests revealed hyperuricaemia at the time of his second attack, but treatment was not continued due to a spontaneous
reduction of symptoms. In May 2002, he was presented to Hiroshima University with a 5-day history of sudden onset of pain and flexion disturbance of his right knee.

Physical examination revealed marked swelling, local heat, patellar ballottement of the right knee, and tenderness over the superolateral aspect of the patella, with difficulty to perform a straight leg raise. The range of motion was remarkably limited to the range of 0 to 20 degrees. The difference in the circumference of his thighs was about 1.5 cm, indicating atrophy of his right thigh. Aspiration of the knee joint released 30 ml of turbid fluid.

On admission, the laboratory values were normal except for a serum uric acid value of 84 mg/l (normal, 30–65 mg/l) and a C-reactive protein value of 92 mg/l (normal, <3 mg/l).

Radiography revealed the bipartite patella classified as Saupe type III, and 2 bone cyst–like lesions connected to the separation site of the patella (Fig. 1). Computed tomography revealed more clearly the osteosclerotic changes surrounding the intrapatellar lesions. Magnetic resonance imaging revealed a low intensity area that was enhanced slightly by gadolinium in only one of the bone cyst–like lesions (Fig. 2).

The patient was prescribed a non-steroidal anti-inflammatory drug (diclofenac sodium 75 mg daily). After 2 weeks, though the laboratory values were improved (serum uric acid, 44 mg/l; C-reactive protein, 4 mg/l), he still could not perform a straight leg raise and the limitation in range of motion persisted. This meant that he could not continue his work as a monk. At this time, he accepted surgery for the excision of the tophi.

Arthroscopy revealed white chalky urate crystals on the surface of the partite patella surrounded by inflammatory synovitis (Fig. 3). The urate crystals were also located at the lateral condyle of the femur facing the lateral facet. Arthrotomy through the superolateral aspect of the patella exposed the abundant white crystals not only in and under the vastus lateralis fascia, but also between the partite patella and in the intra-osseous lesions (Fig. 4). Extensive curettage of the tophi was performed, and the bone defect of the patella was filled with a sound portion of the excised partite bone. The patella was then fixed by bioabsorbable pins (Poly-L-Lactate pin; PL-Fix, GUNZE, Kyoto, Japan).

The histological diagnosis was chronic gouty synovitis with eosin-like materials surrounded by epidermoid cells and inflammatory reactions by giant cells (Fig. 5).

Five days after surgery, he was able to
perform straight leg raise. Two weeks after surgery, full range of motion of the knee and full weight bearing were restored. At 2 years’ follow-up, he had no recurrence of symptoms and was able to resume his job.

**DISCUSSION**

Gout is a form of crystal-induced arthritis, with acute attacks occurring commonly in the first metatarsophalangeal, ankle, or knee joints. Tophi have been found in 9% to 10% of gout patients, and the most frequent sites of deposition are the external ears and subcutanea of the fingertips.\(^1,2\) Tophaceous gout occurring in the knee, especially the patella, is rare.

To the best of our knowledge, there have been 20 cases of tophus in or around the patella in the English medical literature,\(^3-12\) with 3 cases occurring in the bipartite patellae.\(^9,13,14\) However, in the 3 previous cases involving bipartite patellae, the tophi were excised by arthrotomy and therefore intra-articular findings that might elucidate the cause of arthritis was little. We describe the first report on the arthroscopic findings of tophus originating from the bipartite patella. The crystals were surrounded by inflammatory synovitis on the articular surface at the separation site of the bipartite patella. The most plausible explanation for the acute arthritis in this case is that the mechanical or chemical destruction of the barrier between the deposits and the joint occurred by the gradual increase of the size of the deposits. In addition, the location of the tophi made us speculate that deposition of urate crystals was induced by some pre-existing inflammatory condition such as enthesopathy in the vastus lateralis or chronic synovitis between the accessory bone and the patella.

In terms of treatment, conservative therapies against the acute attack resulted in no improvement of function. Even if the diminished range of motion was recovered, the mechanical stress to the bipartite patella could cause an acute recurrence. Tophi in the patella may be difficult to reduce in size by conservative therapies and may lead to pathological fractures. Indeed, there are some reports of pathological fracture of the patella caused by gout.\(^3,10\) We aimed to improve
the patient's knee function, to remove the source of the crystals that might cause arthritis in the future, and to prevent further destruction of the patella caused by enlargement of the tophi. Our treatment resulted in an immediate relief of pain, and there had been no recurrence of symptoms at 2-year follow-up. We concluded that tophi around the bipartite patella should be treated by surgical excision to prevent deposition causing recurrence of gouty attacks.

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