Snapping Knee due to a Femoral Osteochondroma after Total Knee Arthroplasty

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A female patient who underwent total knee arthroplasty presented with a snapping sensation over the left knee at 10 years postoperatively. Initially, the bony mass was visible on the medial femoral condyle radiographically at 5 years postoperatively. The mass had enlarged over time and her symptoms were progressive. The mass was excised at postoperative 18 years and confirmed as an osteochondroma histopathologically. The patient's symptoms have been completely resolved for 3-year follow-up after excision.

Level of Evidence: V

Keywords: Knee, Arthroplasty, Osteochondroma, Snapping

Snapping knee is an unusual problem caused by a variety of conditions, and osteochondromas has been reported as a one of causes for snapping symptoms of the native knee. However, the occurrence of snapping knee after total knee arthroplasty (TKA) is extremely rare; and there has been only one report concerning snapping pes syndrome caused by an osteophyte after TKA.

To the best of our knowledge, there has been no report related to snapping knee after TKA caused by an osteochondroma. The patient was informed that data concerning the case would be submitted for publication, and the consent of the patient was obtained.

Case Report

A female patient underwent primary TKA with Duracon® prosthesis (Stryker Orthopaedics, Mahwah, NJ, USA) in both osteoarthritic knees at 56 years of age. At 10 postoperative years, and without any significant previous injury, she complained of a snapping sensation and discomfort on the medial side of the left knee. She was treated with intermittent anti-analgesic medication and closely observed with serial X-ray follow-up. The symptoms waxed and waned over the course of the next 8 years.

They became more frequent after a recent fall and the patient localized the sensation of snapping to the region of a palpable lump, about 5 cm above the joint line. On physical examination, there was no remarkable swelling or gross deformity. The passive range of motion (ROM) in her left knee had been between 0° and 120° until 5 postoperative years. However, the mass gradually enlarged over the course of time and her symptoms progressed so that, just prior to the excision, the passive ROM had decreased from 0° to 95°. There was mild tenderness on the medial femoral condyle, and palpable snapping was felt when passively extending the knee from a flexion angle of 40° to one of 20°.

The pre- and postoperative 1-year radiographs showed no evidence of a mass that could have been causing the snapping (Fig. 1). A small protruding radiopaque mass was visible on the medial epicondyle on the radiograph taken at 5 postoperative years and its size became gradually larger in serial follow-up radiographs (Fig. 1). The computed tomography scan was taken for further precise evaluation at postoperative 18 years (Fig. 2). The pedun-
Fig. 1. Anteroposterior radiographs of the patient's left knee. The protruding mass was distinctly visible after 5 post-TKA years, and gradually enlarged until 18 post-TKA years just prior to excision. Preop: preoperative, TKA: total knee arthroplasty.

Fig. 2. The computed tomography of the patient's left knee taken at postoperative 18 years. The bony mass (white arrows) was observed in the posteromedial portion of the medial femoral condyle. There was bony stalk showing corticomedullary continuity between the mass and the adjacent femur.
culated bony mass was observed in the posteromedial site of the medial femoral condyle. There was a bony stalk showing cortico-medullary continuity between the mass and the adjacent bone. Further conservative management including anti-inflammatory medication, liniment, and physical therapies was not effective. Therefore, we discussed the physical and radiographic findings with the patient and decided to perform surgical excision of the bony mass at 18 years after the TKA.

The patient was positioned supine under general anesthesia and a pneumatic tourniquet was used. A new 5 cm longitudinal incision, which was separate from the previous midline incision for TKA, was made on the medial aspect of the femur; the mass was expected to be well exposed with the medial approach because of the posteromedial location. Intraoperatively, a 3×3×2.5 cm bony mass was located over the medial femoral epicondyle, lying deep to the adductor fascia (Fig. 3A). The impingement of the sartorius by the protruded mass was observed during the passive knee motion. The deep fascia was incised parallel to its fibers for the bony mass exposure. The mass was excised en bloc, and it appeared to be a round lobulated mass surrounded by cartilage (Fig. 3B). The specimen was assessed histopathologically, and diagnosed with osteochondroma (Fig. 4).

Postoperative radiographs confirmed complete removal of the bony mass (Fig. 1). The patient could walk with full weight bearing on the second postoperative day. She has not experienced any further pain and snapping after excision of the osteochondromas for 3 years after surgery.

Discussion

The most important finding of the present study was that a snapping knee can be caused by a femoral osteochondroma after TKA.

Tensho et al. described a case of snapping knee due to the tibial osteophyte and pes anserinus tendon after TKA; the patient reported snapping 1 year postoperatively, which did not progress over time. They described that presence of the osteophyte might be caused by under resection during TKA procedure or a change in the alignment of the lower leg after TKA. In the present study, spontaneous growing osteochondroma detected at 5 years postoperatively was the cause of snapping; the patient presented a snapping and discomfort at postoperative 10 years and the symptoms progressed gradually over time. To the best of our knowledge, this is the first report of snapping knee caused by a femoral osteochondroma after TKA. Several studies have reported that the osteochondromas can cause the snapping around the native knee. However, snapping knee caused by an osteochondromas following TKA has never been reported.

Osteochondromas are the most common benign tumors of the bones. They usually originate in the metaphyseal areas of the long bone and are present during the period of rapid growth. However, interestingly, the osteochondroma in our case develope-
oped spontaneously in the elderly woman and had grown over time. Although a para-articular osteochondroma, which is very rare, is known to appear in advanced age, it would be appropriate to regard the tumor we report as a conventional osteochondroma in terms of the bony stalk showing corticomedullary continuity with the adjacent bone. In addition, there was no trauma history considered as the etiology for para-articular osteochondroma.

All of the snapping around the knee involves a similar mechanism leading to dislocation of the tendon and pain, and the mechanism also can be applied to our case. On flexion and extension of the knee, a prominent osteochondroma would cause the tendon to be levered over the mass, resulting in snapping and pain. Patients suffering from snapping syndrome after TKA are more likely to have functional limitations including limping, swelling, and stiffness of the knee. The present study showed that the ROM had decreased with the gradual increase in mass size and snapping frequency. The osteochondroma in our patient was resected without tendon surgery. When there is no apparent cause for snapping, tendon transfer or resection can be performed not only of the pes anserinus but also of the popliteus tendon. However, in our case, the osteochondroma was the main cause of the symptoms. The symptoms resolved after bony resection; thus, the treatment proved to be effective when the cause of the snapping was obvious.

In conclusion, although uncommon, osteochondromas can be considered as one of causes when snapping knee appears after TKA. We consider surgical excision to be a good treatment for patients with snapping knee due to osteochondroma in cases the symptoms are sustained despite conservative treatment and the mass enlarges gradually.

**Conflict of Interest**

No potential conflict of interest relevant to this article was reported.

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