Case Report

Fibromas arising from the posterior cruciate ligament tendon sheath in the bilateral knee joints: Case report

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ABSTRACT

Fibroma of tendon sheath in the intra-knee joint is a very rare and benign soft-tissue tumour which has been reported unilaterally in the various aged people. To help distinguish it from other similar kinds of lesions and symptoms including osteoarthritis, we report the oldest case of fibromas arising from the posterior cruciate ligament tendon sheath in the bilateral knee joints within one year of each other confirmed with magnetic resonance imaging (MRI) features, operative findings and histological examination.

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1. Introduction

Fibroma, a benign soft-tissue tumour, occurs in fingers, toes and wrist joints; it usually originates from tendons or tendon sheaths. Only 11 unilateral intra-knee-joint fibromas arising from posterior cruciate ligament (PCL), patellar tendon, suprapatellar pouch, fat pad and posterior capsule, to the best of our knowledge, have been reported with various MRI findings. [1–11] We report the oldest case with bilateral knee-joint fibromas arising from the PCL tendon sheath based on the MRI findings.

2. Case report

At presentation to another hospital, a 73-year-old man with a 1-year history of right-knee pain had slight right-knee swelling, no flexion limitation. After 9 months of knee osteoarthritis (OA) treatment with nonsteroidal anti-inflammatory drugs and hyaluronic acid injections, extension contracture gradually progressed. At his consultation at our hospital, findings included no family history or past medical history, no trauma, but slight swelling and tenderness in the right medial femorotibial joint only. There were no plantar and palmar fibromatosis. Range of motion (ROM) was

extension of -10° and flexion of 70° ; radiographic images were classified as Kellgren-Lawrence grade 2. Magnetic resonance imaging (MRI) found a mass ($20 \times 18 \times 15$ mm) along the PCL with low signal intensity in proton density image, intermediate signal intensity in fat suppression T2-weighted MRI and post-gadolinium almost central enhancement (Figs. 1 A–C, 2 A–C).

Arthroscopy revealed a slightly hard white mass on the PCL and covered in a layer of synovium, which was tightly adherent to the PCL and adjacent to lateral wall of the medial condyle (Fig. 3A); the tumour was excised with scissors and ArthroCare (Smith & Nephew) through two portals (infrapatellar anteromedial and anterolateral) under arthroscopy (Fig. 3B, C). Histology showed proliferation of fibroblast-like spindle cells in the dense collagenous tissue at lower power (Fig. 4A). The tumour periphery had cleft-like spaces composed of blood vessels and slight lymphocytic inflammatory cells at higher power. There were no multinucleated and abnormal split nucleoli of the cells (Fig. 4B). The tumour was reported as fibroma of the tendon sheath.

Six months postoperatively, left knee pain developed, and extension contracture advanced gradually. ROM was extension of -5° and flexion of 90° . MRI showed a mass ($21 \times 20 \times 12$ mm) along the PCL (Fig. 1D–F), and intermediate signal intensity in proton

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Fig. 1. Pre-operative plain MRI of both knees.

(A), (B) and (C) are the right knee and (D), (E) and (F) are the left knee.

(A) low and (D) intermediate signal intensity in Proton density coronal view; (B) intermediate and (E) intermediate signal intensity in Fat suppression T2-weighted sagittal view; (C) a little intermediate and (F) intermediate signal intensity in Fat suppression T2-weighted axial view. Red arrowheads show mass lesions.

density image and gadolinium enhancement of the whole body (Fig. 2D–F). Arthroscopy revealed a soft yellowish mass on and beneath the PCL, adherent to PCL (Fig. 3D); the mass was excised (Fig. 3E, F). Histologic findings were fundamentally the same bilaterally, but staining was stronger than the other side (Fig. 4C, D). Two years of right knee and one year of left knee postoperatively, both knees were pain free. The ROM was improved from $-10^{\circ}/70^{\circ}$ to $0^{\circ}/140^{\circ}$ on the right and $-5^{\circ}/90^{\circ}$ to $-5^{\circ}/135^{\circ}$ on the left. There were no posterior drawer sign in both knees after operation. He had no clinical signs of recurrence.

3. Discussion

This is the first report of bilateral knee fibromas arising from the PCL tendon sheath occurring asynchronously within one year. There have been only 11 previously reported intra-knee-joint fibromas: all were unilateral, occurring in young or middle-aged patients, and were located in the infrapatellar fat pad, patellar tendon, suprapatellar pouch, posterior capsule, or PCL.^{1–11} The current patient was the oldest and had bilateral knee-joint fibromas compared to the previous report. Intra-knee-joint fibroma symptoms include joint effusion, locking, discomfort and pain.^{1–11} The current patient initially experienced pain, and limited ROM gradually appeared. The tumour might have originated from the PCL tendon sheath. Peri-PCL compression might have caused extension contracture, consistent with the arthroscopic finding of tumour enlargement with knee flexion.

MRI findings of intra-knee-joint fibroma have been reported^{2–11}; in the current case, findings were low to intermediate signal intensity and post-gadolinium enhancement in the entire tumour. On the other hand, the various signal intensity and peripheral enhancement in the tumour had been reported in the previous literature.^{2,5,6,8,11} These different findings from current case might be depended on the maturity of the tumour including hyalinized or sclerosed forms and vascularity on taking MRI, which were shown in the staining difference.

MRI could be detected different findings between the sides for a fibroma of PCL tendon sheath depended on the maturity in the current case, it should be included in the differential diagnosis of an intra-knee-joint soft-tissue tumour. Consequently, we developed a preoperative differential diagnosis that included tenosynovial giant cell tumour (localized and diffuse type) and nodular fasciitis. Arthroscopic excisions in right and left knee were done in the current study, respectively. On the other hand, Chung reported that the recurrence rate after excision of a fibroma of tendon sheath was 24% due to incomplete excision.¹² More careful follow-up period is needed in the current case.

In conclusion, bilateral fibromas arising from the PCL tendon sheath showed the various MRI findings and OA-like symptoms occurred asynchronously in this case, illustrating the careful diagnosis of considering fibroma in the differential diagnosis from knee OA.

Fig. 2. Pre-operative enhanced MRI of both knees.

(A), (B) and (C) are the right knee and (D), (E) and (F) are the left knee.

(A) and (D) Fat suppression T2-weighted coronal view; (B) and (E) Fat suppression T2-weighted sagittal view; (C) and (F) Fat suppression T2-weighted axial view. Bilateral tumours were entirely post-gadolinium enhanced. Red arrowheads show mass lesions.

Fig. 3. Arthroscopic findings of both knees at operation.

(A), (B) and (C) are findings of the right knee and (D), (E) and (F) are findings of the left knee. All are views of anterolateral portal: (A) and (D) before excision and (B) and (E) after excision: (C) and (F) of the space between the lateral wall of medial condyle (LMC) and PCL after excision. ACL: anterior cruciate ligament. Red arrowheads show mass lesions.

Fig. 4. Histology of tissue excised from both knees (Haematoxylin and eosin stains $\times 10$: (A) and (C), $\times 40$: (B) and (D)). (A) and (B) are for the right knee, and (C) and (D) are for the left knee.

There were cleft-like vascular spaces (asterisk) surrounded by fibroblasts (arrow head) and chronic inflammatory cells with no atypical forms.

Conflict of interest

None.

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