An unusual case of pigmented villonodular synovitis after unicompartamental knee arthroplasty

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ABSTRACT

Introduction: Pigmented villonodular synovitis (PVNS) after replacement arthroplasty is a potential cause of postoperative pain and hemarthrosis. The disease is difficult to diagnose after arthroplasty, since magnetic resonance imaging (MRI) appearances are subject to metal artifact making them less than ideal. Case Report: A case of a 61-year-old woman with PVNS after unicompartamental knee arthroplasty (UKA). She was treated with an arthroscopic synovectomy with good result. Conclusion: MRI evaluation of the residual side of the knee joint after UKA is valuable for the differential diagnosis of PVNS.

Keywords: Pigmented villonodular synovitis (PVNS), Unicompartamental knee arthroplasty (UKA), Hemarthrosis, magnetic resonance imaging (MRI)

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INTRODUCTION

Pigmented villonodular synovitis (PVNS) is a relatively rare, proliferative disease affecting the synovial joints resulting in villous or nodular changes in the synovial tissue, large effusion and bony erosions. PVNS after replacement arthroplasty is rare and to our knowledge, a few cases have been reported in literature [1–5]. We report a case of diffuse PVNS after unicompartamental knee arthroplasty (UKA). This is the first report that uses magnetic resonance imaging (MRI) for differential diagnosis of PVNS after UKA. This disease is difficult to diagnose after arthroplasty, due to artifact typically observed on MRI. However, the appearance of the residual side of the joint on MRI can contribute to the diagnosis of PVNS in USA patients who present with knee pain and recurrent effusion/hemarthrosis [6].

CASE REPORT

A 61-year-old woman presented with a 5-year history of progressive pain in her knee. Examination and X-ray findings were consistent with a diagnosis of osteoarthritis. She underwent cemented unilateral knee
arthroplasty (Zimmer Unicompartmental High Flex Knee System, Zimmer, Warsaw, Ind) without complication. At the time of surgery, no abnormal synovial membrane findings were detected, and synovectomy was not performed (Figure 1). Although postoperative radiographs demonstrated the oversized prosthesis, the patient progressed well in the first year after the UKA, with a range of motion from 0° to 130° and excellent ligamentous stability. However, 3 years after surgery, she had a spontaneous onset of right knee pain and swelling without history of trauma. She had mild medial-sided tenderness and a moderate knee effusion without erythema or warmth upon examination. Inflammatory markers at the time were normal. Plain radiographs were unremarkable (Figure 2). Arthrocentesis of the right knee showed bloody aspiration, and revealed no growth with cultures. MRI of the right knee was performed using a 0.35 Tesla. Axial T1-weighted spin-echo (TR/TE = 600/15 m-s) and gradient-echo (TR/TE = 800/30 m-s, 30° flip angle) MR images revealed villous shaped synovial proliferation with a large amount of joint effusion (Figure 3). Mild blooming artifact was seen in the synovium on the gradient-echo image. These imaging findings in addition to the bloody aspiration were compatible with PVNS. The patient was then considered to be a candidate for total arthroscopic synovectomy. The synovium was observed to be diffusely inflamed and hemosiderin colored at the time of surgery (Figure 4). The components were well positioned, tracked well, and no polyethylene wear was observed. There was no growth on operative cultures, and histologic analysis of synovial samples revealed PVNS (Figure 5). The patient had no pain with a mild effusion at the one-year follow-up visit after arthroscopic synovectomy.

DISCUSSION

Pigmented villonodular synovitis is a benign proliferative synovial disorder of unknown etiology that can affect bursae, tendon sheaths, and joints [7, 8]. The incidence of PVNS is 1.8 per one million in the general population and the knee is the most common joint to be affected [9].

It has been reported that PVNS is diagnosed an average of 4.4 years after presentation without MRI [10]. The decision to perform arthroscopic observation in a patient who previously underwent arthroplasty is difficult due to the artifact with the MRI and the risk of infection. Articular implants are considered as devices, which limit MRI visualization due to the induction of susceptibility artifacts. However, the MRI in the residual portion of the joint in patients with a history of UKA is visible [6]. In this case, MRI was safely applied and was valuable in making the decision to proceed with the arthroscopy. Our case shows the clinical value of MRI of patients with UKA.

The etiology of PVNS is unknown, although chronic recurrent micro-trauma and hemarthrosis have been suggested [9]. There were two previous reports in
CONCLUSION

The evaluation of the residual side of knee joint after UKA by MRI is potentially valuable for the different diagnosis of PVNS.

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Author Contributions
Tomohiro Onodera – Substantial contributions to conception and design, Analysis and interpretation of data, Drafting the article, revising it critically for important intellectual content, Final approval of the version to be published
Hiroshi Tanji – Substantial contributions to conception and design, acquisition of data, Drafting the article, Final approval of the version to be published
Tokifumi Majima – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published
Tamotsu Kamishima – Analysis and interpretation of data, Drafting the article, Final approval of the version to be published
Akio Minami – Substantial contributions to conception and design, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor
The corresponding author is the guarantor of submission.

Conflict of Interest
Authors declare no conflict of interest.

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REFERENCES


