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A Locked knee Due To A Large Nodule of Pigmented Villonodular Synovitis in Patello-Femoral Joint

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We report a case of a diffused type of pigmented villonodular synovitis (PVS) of the knee presented as a locked knee due to the impingement of a large nodule of PVS into the patello-femoral joint in a healthy 47-years old woman. The diagnosis of PVS was suspected preoperatively because of the characterristic feature demonstrated in magnetic resonance images (MIR). The margin of the diseased synovium was best demonstrated on T2-weighted images. The synovium contained areas of void signal intensity felt to be due to hemosiderin. Although arthroscopic excision of the localized lesions securred a good result, we have done open synovectomy in our case because of its diffuse nature, as proven by arthroscopic examination. This case emphasizes the importance of maintaining the differential dlagnosis of a locked knee.

Key Words
PVS,
Nodules,
MIR,
Arthroscopy,
Locked knee.

INTRODUCTION

Pigmented villonodular synovitis (PVS) is a rare proliferative disorder of the synovium of joints and tendon sheaths[1-3]. It is a benign, usually monoarticular proliferation of synovium which is characterized by an insidious onset of swelling with minor discomfort in a single joint, or rarely in several joints[4]. PVS typically occurs around the knee, and less frequently in other joint such as the hip, ankle, and shoulder. Since Jaffe's original description[5], intraarticular PVS has been subclassified based on its macroscopic appearance[6]. Macroscopically, the condition is characterized by areas of diffuse villous hypertrophy of the synovium or by a single lesion or cluster of nodular masses. Nodular PVS refers to the pedunculated synovial lesion: these patients often present a clinical picture of internal derangement[7,8]. In the typical patient, PVS may be suspected clinically, but often the presentation is atypical. Magnetic resonance imaging (MIR) is an excellent tool for examining the nature and extent of this disease in the case presented here, because it can demonstrate all the areas of soft tissues without the use of contrast agents[9]. In this report, we describe a case of PVS of the knee mimicking soft tissue

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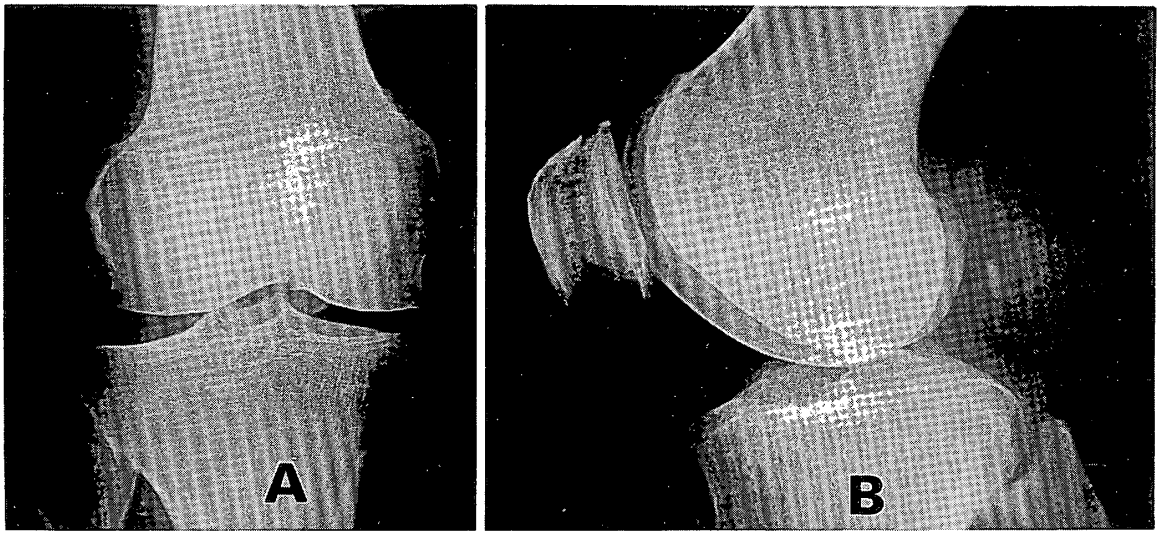
tumor which demonstrated a locking phenomenon of the patello-femoral joint.

CASE REPORT

A 47 years old woman with a three year history of progressive pain and swelling in the right knee. She noticed increased swelling, pain and soft tissue mass superolaterally in the right knee for 4 months. She also experienced several episode of locking of the right knee, and with each episode of locking any attempt to extend the joint caused patello-femoral pain. There was a history of direct trauma to the knee in a traffic accident four years ago. On physical examination, a firm, nontender, 4×6 cm mass was palpated in the lateral side of patello-femoral joint. Examination also revealed a large effusion and extensive synovial thickening. The locking of the knee joint occured at a point from 30 to 60 degrees below complete extension. When locking occured, it was sudden; and when the knee unlocked, the patient had a relatively free range of painless motion. A plain radiograph (Figure 1) showed only the degenerative changes to be present. Laboratory data including blood cell counts, erythrocyte sedimentation rate, C- reactive protein, and other parameters of acute inflammatory reactants showed a value within the normal limit. Magnetic resonance imaging (MRI) studies showed a large mass in the right patello-femoral joint space with superior and anterior extension. The mass areas manifest very bright signal intensity on T2-weighted images (Figure 2B), and was homogeneously hypointense on T-1 weighted images, are consistent with diffuse type PVS[7]. A provisional dlagnosis of diffuse type PVS was made. Arthroscopy was performed to confirm the diagnosis. Arthroscopic examination revealed generalized villous thickening of the synovial tissue, and there were several brownish pigmented areas and numerous ovoid nodules, from 7 mm in diameter to 6 cm. Extensive open synovectomy was performed (Figure 2C). Pathologic examination revealed pigmented villonodular synovitis which is characterized by proliferation of fibrous stroma, infiltration by histiocytes and multinucleated giant cells (Figure 3A), and hemosiderrin within macrophages and synovium[12,14] (Figure 3B), and foam cells (Figure 3C). A short-term follow up of four months following surgery, the patient was in good health and all symptoms had resolved.

DISCUSSION

The characteristic feature of the case presented here is a locking phenomenon of patello-femoral joint due to the impingement of a large nodule from the PVS. Although a case has been reported demonstrating a localized PVS presented as a locked lateral meniscal bucket handle tear[10], as far as we know a locked knee due to a PVS patello-femoral nodule has not been observed previously. In our case the PVS large nodule seems to have arizen from patellar plica and spread to the diffuse type[5]. There has been one case report of a PVS arising from patellar plica[11], but that was a localized manifestation. Most



Fgiure 1. Antero (A) and lateral (B) radiographic views of right knee.

reported cases of localized PVS have been limitted to be the anterior compartment near the anterior horns of menisci or along the gutters[12,13].

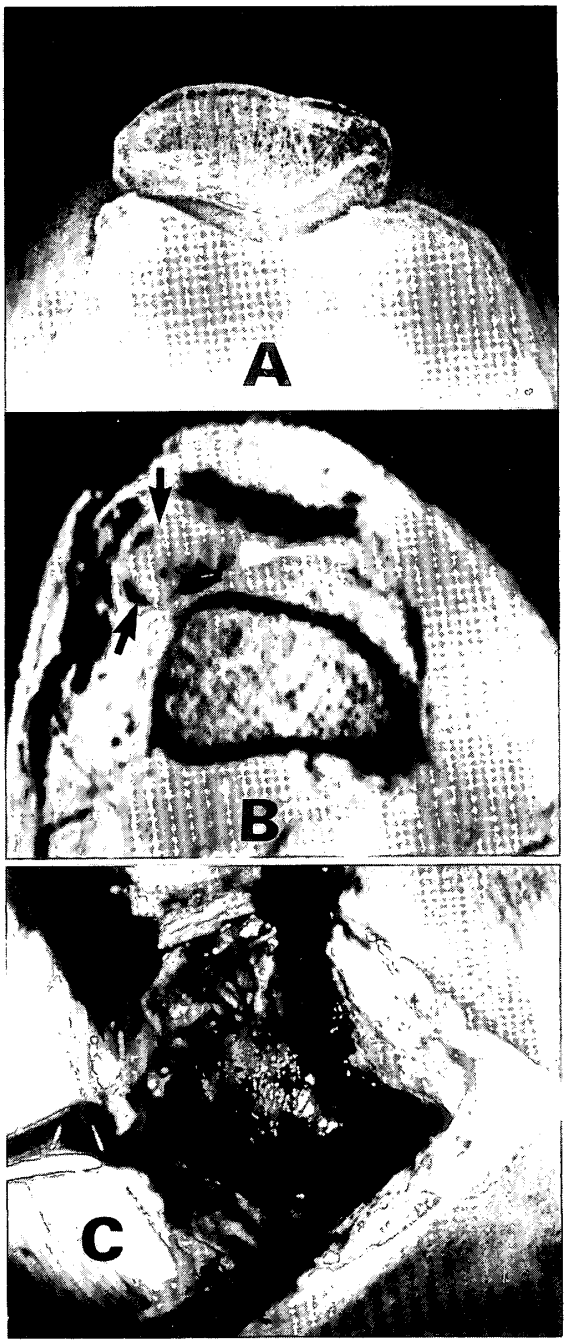
Patients with a diffuse form of PVS, as in the case presented here, demonstrate a clinically present indolent course of increasing pain, joint swelling and limitation of range of motion. Due to the location of the lesion, one would not expect to find mechanical symptoms such as locking or cruching of the knee or symptomatic patella plica, which has been noted previously with pedunculated lesions in other conditions[12]. When locking occurs as in our case, it is sudden and dramatic; even more characteristic of the lesion is the suddenness with which it may unlock, giving the patient a relatively free range of painless motion.

The use of MRI scanning in the diagnosis and follow up of soft tissue tumor is well established[9]. Roentogenographic plain film show osteoarthritic changes, but MRI show the characteristic appearances of PVS. Because of the large amount of hemosiderin present in the synovial tissue, there are focal areas of marked signal loss on the T2-weighted MR images[9,15], and nodules manifest areas of very bright signal intensity on T2-weighted images and homogeneously hypointense on T1-weighted images.

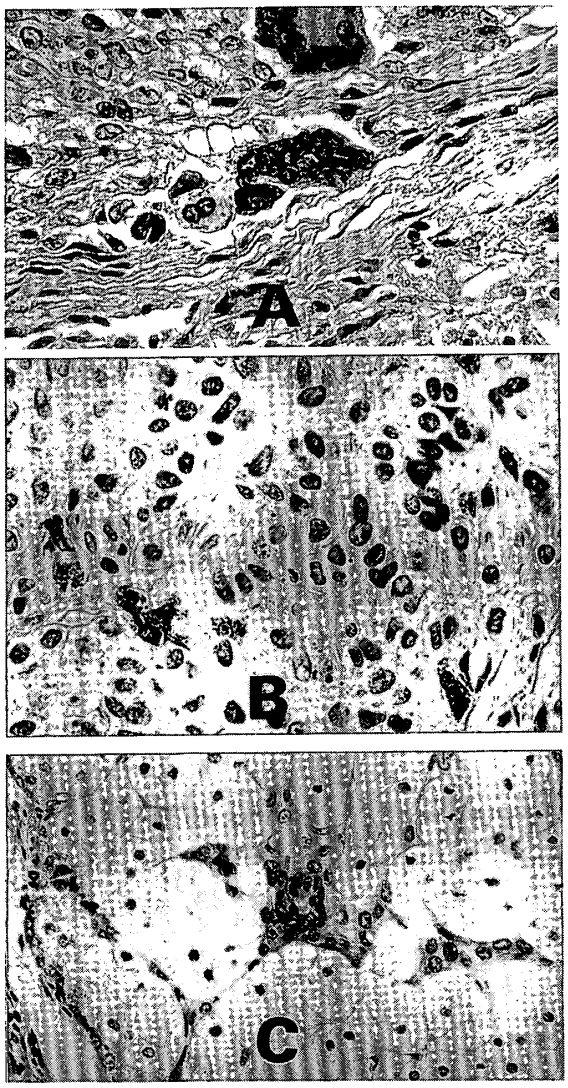
This case emphasizes the importance of maintaining differential diagnosis. Differential diagnosis of a locked knee includes loose body, acute osteochondral fragment, displaced meniscal tear and soft tissue mass[10].

Arthroscopically, PVS appears as a mildly pigmented synovial mass, and arthroscopy can be used as an excellent diagnostic tool for identification for intraarticular PVS.

Although arthroscopic excision of localized lesions securred a good re-



Fgiure 2. Plain radiograph of axial view of patello-femoral joint (A). T2-whighted MRI (B) shows very bright intensity of the mass (arrows). A large nodule in the surgery (C).



Fgiure 3. Histologic changes of the synovium and the nodule. Multinucleated giant cells (A), haemosiderin laden cells (B) and numerous foam cells are seen. original magnifications; A: × 100, B: ×100, C: ×200

sult, this procedure appears to be the treatment of choice for lesions with an area of sufficient size to be removed arthroscopically[16]. The most widely accepted treatment is open synovectomy, as we have done on our case. Even with a wide excision of the synovial tissue, there is a considerable rate of recurrence because of the tecenical diffculty of performing a complete synovectomy.

REFERENCES

1. Beguin J, Locker B, Vielpeau C, et al. Pigmented villonodular synovitis of the knee: results from 13 cases. Arthroscopy 5: 62–64, 1989
2. Flandry F, Hughston JC: Current concepts review: Pigmented villonodular synovitis. J Bone Joint Surg 69A: 942–949, 1987
3. Johanson JE, Ajjoub S, Coughlin LP, et al. Pigmented villonodular synovitis of joint. Clin Orthop 163: 159–166, 1982
4. Wendt RG, Wolfe F, McQueen D, et al. Polyarticular pigmented villonodular synovitis in children: evidence for a genetic contribution. J Rheumtol 13: 921–926, 1986
5. Jaffe HL, Lichtenstein L, Sutro CJ. Pigmented villonodular synovitis, bursitis, and tenosynovitis- A discussion of the synovial and bursal equivalent of the tenosynovial lesion commonly denoted as xanthoma, xanthogranuloma, giant cell tumor or myeloplaxoma of the tendon sheath, with some consideration of this tendon sheath lesion itself. Arch Pathol 31: 731–765, 1941
6. Granowiz SP, D'Antonio J, Mankin HL. The pathogenesis and long-term end results of pigmented villonodular synovitis. Clin Orthop 114: 335–351, 1976
7. Poletti SC, Gates HS, Martinez SM, et al. The use of magnetic resonance imaging in the diagnosis of pigmented villonodular synovitis. Orthopedics 13: 185–190, 1990
8. Flandry FC, Jacobson KE, Andrews JR. Localized pigmented villonodular synovitis of the knee mimicking meniscal injury. Arthroscopy 2: 217–221, 1986
9. Suh JS, Griffiths HJ, Callaway H, et al. MRI in the diagnosis of synovial disease. Orthopedics 15: 778–781, 1992
10. Van meter CD, Rowdon GA. Localized pigmented villonodular synovitis presenting as a locked lateral meniscal bucket handle tear: A case report and review of the literature. Arthroscopy 10: 309–312, 1994
11. Mori Y, Hiro H, Fujimoto A, et al. Pigmented villonodular synovitis of patellar plica. Arthroscopy 5: 340–341, 1989
13. Moskovich R, Parisien S. Localized pigmented villonodular synovitis of the knee: arthroscopic treatment. Clin Orthop 271: 218–223, 1991
14. Flandry F, Hughston VC. Current concept review: pigmented villonodular synovitos. J Bone Joint Surg 69A: 942–949, 1987
15. Kransdorf MJ. Magnetic resonance imaging of musculoskeletal tumors. Othopedics 7: 1003–1016, 1994
16. Ogilvi-Harris DJ, McLean J, Zarnett ME. Pigmented villonodular synovitis of the knee. J Bone Joint Surg 74A: 119–123, 1992