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**Case Report**

# Total knee arthroplasty in pigmented villonodular synovitis: a case report and its management

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## ABSTRACT

Pigmented villonodular synovitis (PVNS) is a benign yet potentially aggressive proliferative lesion of the synovium, which can lead to significant morbidity, particularly when associated with osteoarthritis. This case report presents a 48-year-old male with a 2-year history of knee swelling and pain, exacerbated over the last 6 months, resulting in impaired daily activities. Clinical examination and imaging revealed severe osteoarthritis and soft tissue swelling around the knee. Surgical intervention involved total synovectomy and total knee arthroplasty, performed concurrently. The patient exhibited favorable postoperative outcomes, achieving full range of motion and resolution of symptoms. This case underscores the importance of recognizing PVNS as a contributor to knee osteoarthritis and highlights effective surgical management strategies to improve patient quality of life. Follow-up care is crucial to monitor for potential recurrence of the disease.

**Keywords:** PVNS, TGCT, DPVNS, LPVNS

## INTRODUCTION

Pigmented villonodular synovitis (PVNS) is a benign, proliferative lesion of the synovium, the bursa, and the tendon sheath. Pigmented villonodular synovitis (PVNS) is a benign but potentially aggressive lesion, characterized by synovial villonodular proliferation with hemosiderin pigmentation and stromal infiltration of histiocytes and giant cells. Pigmented villonodular synovitis (PVNS) is a subtype of tenosynovial giant cell tumors (TGCT)that diffusely affect the soft tissue lining of joints and tendons. PVNS most commonly affects the knee, hip and ankle joints and is insidious in onset with symptoms.[1,2]

Pigmented villonodular synovitis has been shown to have neoplastic components. Translocations of chromosome 1p13 are present in the majority of PVNS cases with the endpoint effect of overexpressing colony-stimulating factor 1 (CSF1). As CSF-1 becomes overexpressed, clusters of aberrant cells form to create focal areas of soft tissue hyperplasia in the synovial cells lining joints.[3]

Although most cases of PVNS/TGCT are benign, PVNS/TGCT can sometimes be locally invasive. The disease can be classified into two types: Diffuse and localised. the diffuse form (DPVNS) attacks the entire synovial membrane of the affected joint. The localized form (LPVNS) is characterized by local proliferation of the synovium as a nodule or pedunculated mass. This type is generally a solitary mass of pedunculated or, much less frequently, 2–3 nodules yellowish-brown in color.[4-8] When LPVNS affects the knee, it is generally located in the anterior compartment.[4,5] The purpose of this paper is to report a case of PVNS with early onset of Severe Osteoarthritis Knee and its management with complete Surgical excision with concurrent total knee arthroplasty.

## CASE REPORT

A 48-year-old male presented with a bilateral (right>left) knee pain and swelling since, 2 years. The pain has worsened over the last 6 months. patient has difficulty in doing activities of daily living. he denied any previous

trauma. Patient denied any complaints of fever or night pain. on examination, there was a 10×8 cm firm swelling palpable in suprapatellar space. there was no overlying warmth, erythema, induration, bruit, dilated veins or regional lymphadenopathy. the swelling was mildly tender on deep palpation.it was non compressible with no change in size on limb elevation. he has no distal neurovascular deficit. the rest of the skeletal system examination was normal. Radiographs (AP and lateral view) was advised.it revealed severe Osteoarthritis of knee joint and a surrounding soft tissue swelling.

The routine blood investigations were within the normal limits. Chest X-ray and ECG done on anesthetists advise. patient had been planned for total knee replacement. A midline parapatellar incision given. on exploration there is extensive synovial outgrowth seen with numerous polypoidal like projections with brownish discoloration. Intraoperatively decision was made for surgical excision with total synovectomy. Specimen sent for histopathological examination.

Total knee replacement done as routine. Drain was inserted. post operatively around 800 ml of drain collected. Patient started weight bearing on postoperative day 1 and started walking with support on postoperative day 2. clean and sterile dressing done on postoperative day 5 and discharged with oral antibiotics. On postoperative follow up after 14 days skin and suture line healthy. suture removal done using clean and sterile techniques. patient is walking without support and no complaints of pain or swelling. knee flexion of 150 degree and full knee extension achieved.

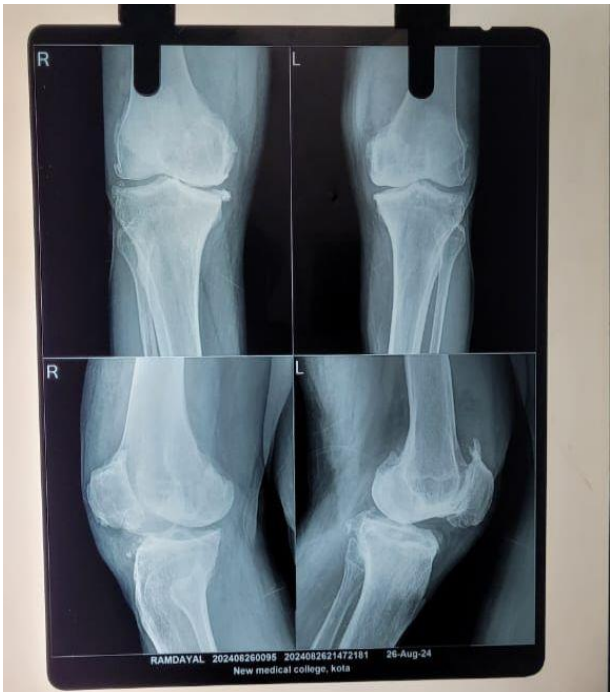


**Figure 1: Pre-op X-ray shows severe OA bilateral knee with soft tissue swelling.**

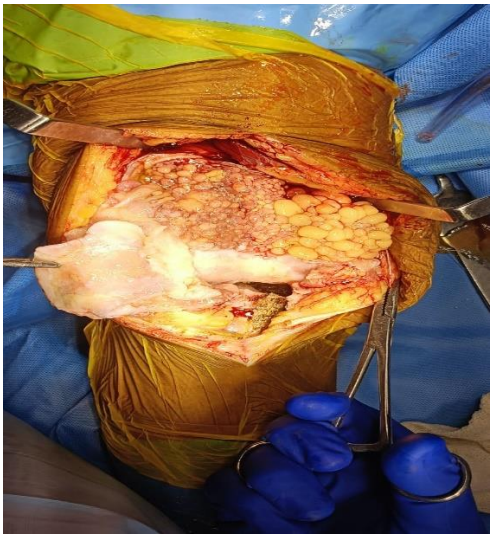

**Figure 2: Intraoperative finding showing numerous polypoidal like projections with brownish yellow discoloration.**

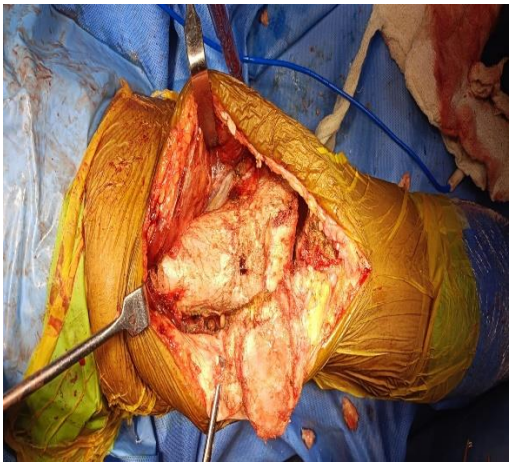

**Figure 3: Surgical excision with total synovectomy.**

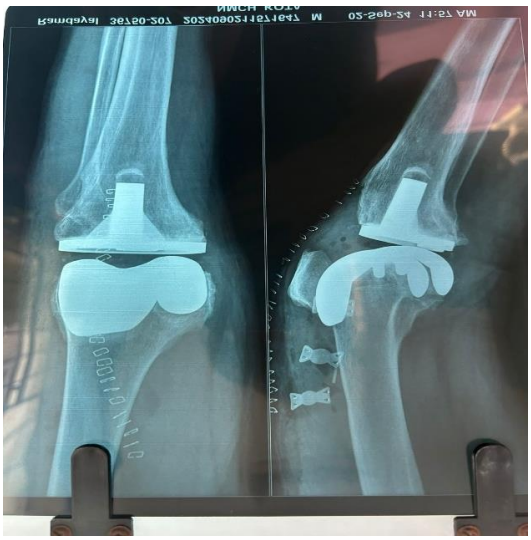

**Figure 4: Post operative X-ray.**

**Figure 5: Knee flexion of 150 degree on postoperative day 14.**

**Figure 6: A complete knee extension on postoperative day 14.**

## DISCUSSION

The gold standard of treatment for pigmented villonodular synovitis has traditionally been surgical excision with total synovectomy of the affected joint, either with an open or arthroscopic approach. Pigmented villonodular synovitis demonstrates a locally destructive process but is rarely fatal. PVNS is primarily a disease of quality of life as it can lead to difficulty with activities of daily living and an overall decrease in quality of life.[9] Rheumatoid arthritis, septic joints, hemarthrosis, and other neoplasia can all mimic the clinical features of pigmented villonodular synovitis upon clinical inspection.[10] Even with ideal radiographic and diagnostic studies, pigmented villonodular synovitis can get misdiagnosed as a ganglion, schwannoma, or hemangioma.[11] If left untreated, the complications of pigmented villonodular synovitis include moderate to severe osteoarthritis, joint deformity, degenerative articular changes.[12] If arthritic changes produce severe erosion of articular surfaces, the ensuing cortical bone destruction can lead to the need for arthrodesis or amputation.[13] In our case Early onset severe Osteoarthritis of knee joint can be attributed to pigmented villonodular synovitis. we have treated the patient disease (PVNS) and its related complication (osteoarthritis knee) concurrently with total synovectomy and total knee arthroplasty.

## CONCLUSION

Pigmented villonodular synovitis (PVNS) is a benign proliferation of synovium, bursa, and the tendon sheath. preoperatively patient will have nonspecific symptoms and it may be related to complications associated with it such as osteoarthritis knee. On surgical exploration decision is made intraoperatively for total synovectomy and total knee arthroplasty concurrently with a good postoperative result, however patient must be educated for recurrence of the disease. patient should be kept in follow up for a minimum of 2 years to observe for the recurrence of the disease.

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