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PIGMENTED VILLO-NODULAR SYNOVITIS OF KNEE JOINT MANAGED WITH OPEN SYNOVECTOMY: A RETROSPECTIVE STUDY OF 5 CASES

Orthopaedics

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ABSTRACT

Purpose: Medium term functional outcome evaluation of Diffuse type PVNS of the knee managed with open synovectomy **Method:** A retrospective study of series of 5 cases of Diffuse type PVNS of the knee was conducted and the outcomes assessed using the Lysholm Score. **Result:** Excellent or good outcome was obtained in 4 out of 5 patients, and fair outcome was attained in one patient, who had recurrence at 14 months postoperatively. **Conclusion:** Total synovectomy provides good functional results at medium term follow up and can be used as an effective treatment for diffuse PVNS knee.

KEYWORDS

Diffuse PVNS, Pigmented Villonodular Synovitis, Knee Swelling, Synovectomy

INTRODUCTION:
Pigmented Villonodular Synovitis (PVNS) is a rare, benign, proliferative disease of the synovial membrane of joints, tendon sheaths, and bursas. Two types described by Granowitz and colleagues[1]:

1)DIFFUSE: Commonly affects larger joints knee and hip. Entire synovium involved, often heavily pigmented ranging from dark yellow to chocolate brown due to hemosiderin deposition.

2)NODULAR: Commonly affects smaller joints wrist, hand, ankle and foot. Part of synovial surface, not darkly pigmented, minimal hemosiderin.

INCIDENCE: 1.8 Cases/ Million not associated with occupation, environment and ethnicity[2,3]. First described by Chassaignac[4] in 1852 and by Jaffe and colleagues in 1941[5]. It typically presents in second and forth decades of life, though the range is 11 to 82 years[6,7]. Most commonly it involves the knee joint (80%)[8]. Pain and swelling is the most common presentation in most of the case reports[9-13]. In this article we describe 5 cases of PVNS, diffuse type, presenting as a localised swelling in the knee joint mimicking as a cyst.

PVNS is considered a benign, locally aggressive process which, if left untreated, can lead to joint destruction and osteoarthritis. Extensive excision of diffuse type of PVNS is considered necessary to prevent the complication that is recurrence. Considering this fact open synovectomy is considered the treatment of choice for the same.

METHODOLOGY:
This is a single centre retrospective study of patients diagnosed with Pigmented villonodular synovitis of the knee were operated upon from 2013 to 2017.

5 patients who were radiologically and clinically diagnosed to be having diffuse type PVNS were included in this study and underwent open subtotal/ total synovectomy. There were 4 men and 1 woman all in the age group ranging from 20 to 40.

Patients usually presented to the outpatient department with complaint of pain and swelling over the knee, since the past few months. One presented with complaint of swelling, gradually increasing in size since the last 3 years. The swelling were usually insidious in onset, the pain in which increased gradually months. Pain increased on squatting and cross leg sitting. Swelling size ranged from pebble to tennis ball size.

The swelling was fluctuant, not fixed to Bone, non pulsatile and non tender. There was a synovitis with positive patellar tap. Movements were restricted to 80-100 degree with terminal pain. Rest of the examination was insignificant.

Patients were investigated with x- rays, which were normal with a soft tissue swelling and MRI of the knee joint. T1 and T2 –weighted MRI showed a diffused synovitis with diminished signal intensity, consistent with Diffuse type Pigmentated villonodular synovitis (PVNS) (Fig-1,2,3).

Fig-1

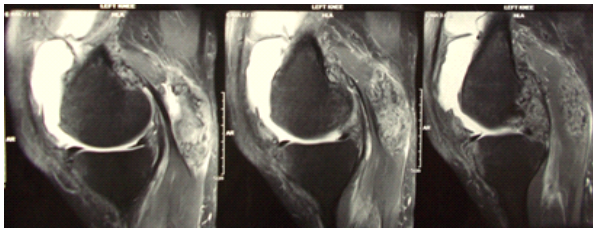


Fig-2

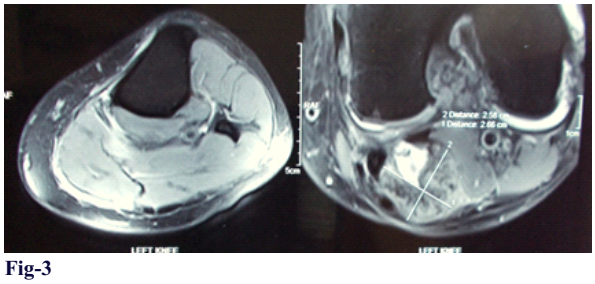
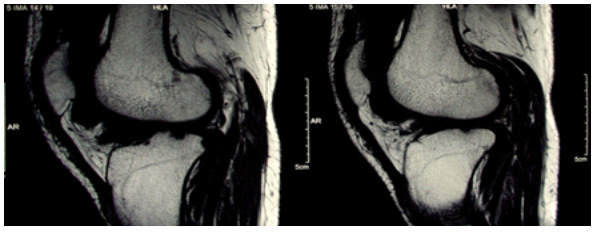


Fig-3



Patients were taken for the surgery with synovectomy and Biopsy as a Pre-operative plan . Surgery was performed under spinal anaesthesia.. Patients were put in lateral decubitus position. Lazy “S” shaped incision was put on the the knee over the swelling and it was exposed and excised from its pedicle along with the synovial tissue (Fig-4). PVNS appears as reddish brown pigments with multiple nodules. After re-draping and putting the patient in supine position, total synovectomy was performed using a separate medial incision - medial parapatellar (Fig-5). approach. Post operative drain was put.

Range of motion physiotherapy along with quadriceps and hamstring strengthening were started immediately postoperative under analgesic

and anti-inflammatory cover, and weight bearing as tolerated. Stitches were removed on 11th to 14th postoperative day.

Follow up of the patient up to two years was made using lysohlm knee score[20] and a clinical assessment of the knee function post operative was assessed.

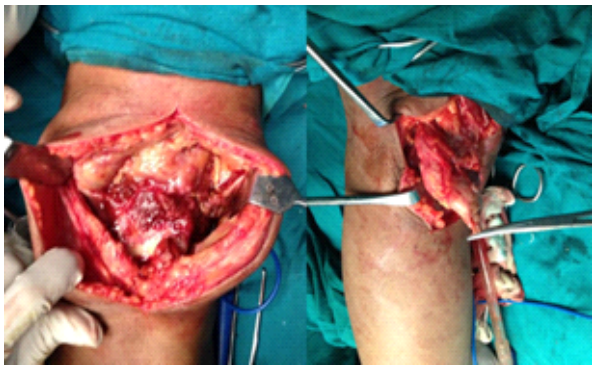


Fig-4

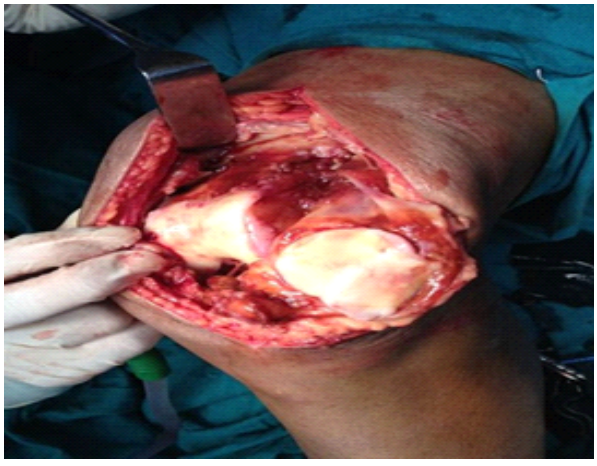


Fig-5

Specimens were sent for histopathology (Fig-6).

Histopathology reports confirmed the radiological and clinical diagnosis of PVNS with HPE findings of Synovial cells with xanthomas, hemosiderin laden macrophages, inflammatory cells, multi nucleated giant cells . (Fig-7).

Fig-6

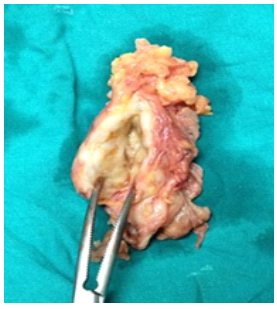
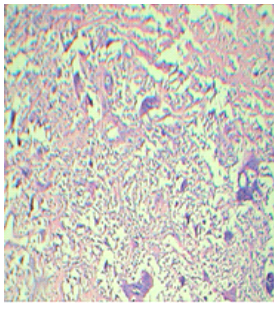


Fig-7



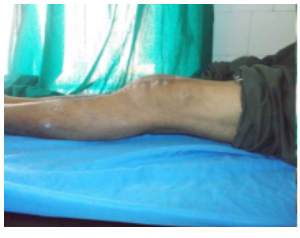


Fig-8

RESULT:

Patient	Age	Sex	Follow Up at (Months)	Lysholm at Follow up	Recurrence	Range of Flexion at 1 Year
Patient 1	27	Male	36	95	None	0-130
Patient 2	38	Female	24	85	None	0-110
Patient 3	29	Male	24	68	Once	0-95
Patient 4	34	Male	28	85	None	0-125
Patient 5	33	Male	14	81	None	0-110

During the period of follow up with a mean of 25 months, there was a single incidence of recurrence. The Lysholm score was excellent in one patient Good in 3 patients and fair in one patient with the incidence of recurrence.

There were no postoperative infections, wound healing problems or incidence of Deep vein thrombosis.

DISCUSSION:

Earlier PVNS was named confusingly as xanthoma, giant-cell tumor, myeloxanthoma, villous arthritis or benign synovioma.

Xanthoma or Giant-cell tumour	Targett 1897
Myeloxanthoma	Dor 1898
Villous arthritis	Dowd 1912
Benign synovioma	Stewart 1948
Jaffe introduced the term pigmented villonodular synovitis [5].	

This shows how over a period of years our understanding about it has changed from considering it as an inflammatory condition to that as a tumor Chassaignac first described them as lesions of the nodular form arising in relation to the flexor tendon sheaths of the middle and index fingers.

The changes of PVNS due to repeated minor trauma of synovial fringes, with consequent hydrarthrosis were attributed by Fisk[13]. Wilson and Galloway attributed it occurring as a disorder of lipid metabolism. Our patients had no history of trauma, which is against Fisk's traumatic pathogenesis. Also their Lipid profile was also within normal limits. Just as most of the PVNS these were also of unknown etiology.

As PVNS mimics many other conditions on physical examination and imaging studies the mean time between presentation and diagnosis is 4.4 years[14]. PVNS of knee is mostly monoarticular arthritis affecting adults in the third or fourth decades of life. Commonest location is the meniscocapsular junction of Knee. Though intercondylar notch, tibial eminence, and peripatellar region are also affected. The clinical presentation in 96% of patients is a large effusion and distension of suprapatellar pouch and 40% have a palpable mass with restricted joint movements[7] these findings were present in our patients. Plain radiographic findings are mostly unremarkable (54%) and non specific soft tissue swelling is found in most cases which is also similar to our cases[15].

MRI is an excellent tool for detection and definition of size, position and extent in PVNS. The classic histologic haemosiderin deposition of PVNS shows as low T1 and T2 intensity which were the findings in our case[15,16,17].

Open synovectomy is preferred in Diffuse PVNS because of the decreased incidence of recurrence compared to arthroscopic approach. However, open synovectomy has its own complications of restriction of range of motion, infection etc. However, in our study at follow up most of the patients were able to carry out their daily routing activities without any hindrance.

Although we did a open synovectomy literature favours arthroscopic synovectomy as the preferred treatment for PVNS, as recovery is faster and there are less functional complications[18]. Newer techniques include augmenting surgery with radiation or infliximab. These are supposed to augment the result decreasing recurrence and hastening recovery but we have no experience[17,19].

CONCLUSION:

Pigmented Villonodular synovitis should be considered as a Differential diagnosis for non-traumatic knee swellings. Open synovectomy provides good result in the medium term follow up but careful total synovectomy is necessary to prevent recurrence. However, with total synovectomy the risk of early osteoarthritis knee exists in literature. Comparative study with arthroscopic synovectomy and/or radiation therapy is needed to assess the long term results.

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