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A clinical prospective study of diffuse PVNS in a teaching hospital

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Abstract

Pigmented villonodular synovitis is a very rare but still an aggressive tumour which involves bursae, tendon sheaths and synovium. The foot and ankle involvement in PVNS is around 2 – 10%. We conducted a prospective study of 8 patients with PVNS of foot and ankle with diagnosis confirmed by X-ray, MRI, histopathology at Mysore Medical College. Mean age was 28.87 (14-46) at diagnosis. All the patients underwent open synovectomy followed by postoperative radiotherapy. At an average follow up of 22 months, 6 patients reported better functional outcomes. Although 2 patients were symptomatic, none of the patients had recurrence of the disease. Thus we conclude that open synovectomy with radiation therapy would reduce the risk of recurrence in diffuse PVNS without causing functional impairment.

Keywords: PVNS-pigmented Villonodular synovitis, foot and ankle, radiotherapy

Introduction

Pigmented villonodular synovitis is a very rare but still an aggressive tumour which involves bursae, tendon sheaths and synovium. The foot and ankle involvement in PVNS is around 2 – 10%. PVNS was grouped into 2 types by Granowitz & Mankin ^[4]: diffuse & nodular types with the former prone to recurrence. In foot and ankle, both the types can occur. The usual clinical symptoms include stiffness of joint, painless nodule or swelling or a vague painful joint. Diagnosis is usually made by clinical presentation, X-ray, FNAC and MRI. On MRI Kottal *et al.* ^[6] described the pathognomonic features of PVNS.

The T1-weighted images with a short TR/TE show the lesion to have density similar to muscle. The T2-weighted images with a long TR/TE show the lesion as dark due to a signal void created by the ferromagnetic hemosiderin in the lesion. (Figs 1, 2, 3).

Since PVNS has a potentiality for aggression, surgical excision only gives a curative treatment and in diffuse forms total synovectomy is required because of chances of recurrence. Complete excision is difficult to achieve in foot and ankle due to its anatomical configuration.

In the management of recurrent disease, radiation therapy is used with moderate radiation doses. When complete synovectomy was not achieved, local recurrences were treated with radio therapy. Blanco *et al.* ^[1] performed partial arthroscopic synovectomy along with external-beam Radio therapy at a dose of 26 Gy for cases of PVNS in the knee joint where posterior joint access was difficult and only partial excision was achieved. 14 % recurrence was noted within 1 year of surgery. We are presenting similar kind of combined treatment for PVNS of foot and ankle.

Patients and Methods

8 patients with MRI, clinical, and histologically confirmed PVNS of the foot and ankle were followed up. This was a prospective study conducted at Mysore medical college and research institute in Department of Orthopaedics from June 2016 to June 2019. There were 4 males and 4 female patients. Mean age was 28.87(14-46) at diagnosis. PVNS was found at ankle in 4 cases and foot at 4 cases. 25 days was the average time from diagnosis to surgery.

The treatment of choice was open synovectomy for all the patients. All the operations were performed by a single surgeon. On histology all the cases were identified as diffuse variety and all the specimens had incomplete resection margins. All the patients post operatively underwent radiotherapy of 30Gy in 20 fractions over 5 weeks. Patients were regularly followed up at Department of Orthopaedics and Oncology

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Table 1: Anatomical distribution of PVNS in foot and ankle

Patient	Age / Gender	Location of lesion	Follow up (months)
1	31/F	Navicular, cuneiform 2nd and 3rd Intermetatarsal spaces	25
2	46/M	Anterolateral ankle	15
3	25/F	Anterior ankle	19
4	14/F	Talo Navicular joint	13
5	32/M	Posterior aspect ankle	18
6	22/M	Calcaneum, navicular, cuboid, sinus tarsi	29
7	25/M	2nd toe MTP joint	36
8	28/F	Proximal phalanx great toe	22

Fig 1: T2W MRI showing hyperintense lesion with surrounding low intense signal in Talo Navicular joint characteristic of hemosiderin deposition

Fig 2: Hemosiderin containing hyperplastic synovial cells seen

Fig 3: Showing giant cells and Papillations

Results

MRI and Patients symptoms were the criteria for calculating outcomes at follow up. At each OPD visits Patients preoperative and postoperative symptoms were compared. Average follow up was 22.12 (Range 13-36 months). Post operatively 6 patients had pain reduced and improved function when compared to pretreatment status. 2 patients had persistent swelling even after treatment. None of the patients had recurrence of the disease on follow up MRI.

Table 2: Table showing symptoms pre and post treatment

	Patients with pre-treatment symptoms	Patients with post-treatment symptoms
Pain	8	2
Stiffness	6	2
Erythema	4	0
Swelling	6	1

Discussion

There is a substantial chance of recurrence in PVNS since it has a potential for aggression. Foot and ankle lacks the integrity of superficial layers which allows the spread of PVNS to adjoining joints and articular surfaces, which makes the complete excision very difficult. For several reasons the Oncologists fear to give radiation for benign disorders 1) surgical wound healing may get complicated 2) risk of radiation induced malignant tumour. In their experience, the Princess Margaret Hospital ^[9] reported fourteen patients with recurrent malignancy with the dose of 30-50 Gy and there was complete response in thirteen of fourteen cases. Moderate radiation is an attractive option in recurrent disease according to this data analysis. Injection of radioactive yttrium 90 locally is also an alternative option. Anterior arthroscopic synovectomy and post-operative RT was combined by Blanco *et al.* ^[11]. With an overall dose of 2,600 cGy for diffuse PVNS of the knee joint. 86% of patients didn't show signs of any recurrence, and there was no apparent harmful effects from RT on an average follow up of 32 months. There are continuous ongoing research on the anti-inflammatory properties of radiation and also on the optimal doses of radiation. In this study we have demonstrated that open resection/ synovectomy with adjuvant low dose radiation is an effective treatment for diffuse PVNS. Draw back to our study are less number of patients and, no comparative study between just operative and adjuvant therapy.

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