

Extraarticular Villonodular Synovitis of the Tendoachilles: A Case Report

K P Looi,**FRCS, M Med*, CK Low,***FAMS,FRCS, M Med*, Y M Yap,****FAMS, M Path, MRCPATH*

Abstract

Extraarticular form of pigmented villonodular synovitis is rare and usually presents as an extension of a primary intraarticular process. Purely extraarticular lesions are even less common. Pigmented villonodular synovitis involving the synovium around the tendoachilles has not been reported. We report a unique case in a healthy 22-year-old male who presented with a swelling around the tendoachilles for a year. It became painful following a traumatic event 4 weeks prior to consultation. Magnetic resonance imaging (MRI) revealed an extraarticular soft tissue mass moulded to the posterior surface of the calcaneum. It was excised and histology revealed pigmented villonodular synovitis.

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Key words: Heel cord, Soft tissue mass

Introduction

Pigmented villonodular synovitis is a progressive synovial lesion of uncertain aetiology associated with synovial-lined tissues of the joints, tendon sheaths and bursae.¹⁻⁶ The incidence was 1.8 patients per million population.⁷

The extraarticular form predominantly occurs on the hands and foot.⁵ Joint lesions most commonly involve the knee. The hip, ankle and other sites are very rare.^{7,8} Extraarticular lesions of the tendon sheath, known as giant cell of the tendon sheath, mainly affect the finger.⁷ Other sites are extremely rare. An isolated case affecting the shoulder bursa was reported.⁶ We encountered a case of extraarticular pigmented villonodular synovitis associated with the tendoachilles in the retrocalcaneal space.

Case Study

A healthy 22-year-old man presented with a slow progressive painless swelling in the left heel for a year. Following a hockey stick injury at the left heel 4 weeks prior to consultation, it began to grow rapidly associated with pain and stiffness of the ankle and subtalar joint. He walked with a limp. Clinically, there was a tender swelling measuring 8 cm in diameter arising deep to the tendoachilles. It was well-defined and firm, and displaced the tendoachilles postero-laterally. There was moderate loss of subtalar and ankle motion. X-rays of the left ankle showed a soft tissue shadow anterior to the

tendoachilles. There was no evidence of bony erosion or periarticular osteopenia. Magnetic resonance imaging (MRI) revealed a well-defined heterogeneous soft tissue mass anterior to the tendoachilles. It moulded itself along the superior aspect of the calcaneal tuberosity. There was no communication with the joint even with gadolinium enhancement (Figs. 1 & 2). A lateral para-achilles incision was made. The sural nerve was retracted away. A loose capsule was found to envelop the tumour. It was lobular, well-circumscribed and xanthochromic. The lesion extended inferiorly to the capsule of the subtalar joint. It was not arising from the joint. The mass measured 8 by 7 cm. It was readily excised in entirety. Histology revealed a sheets and islands of foamy cells admixed with polygonal cells in the background of collagenous tissue. Multinucleated giant cells and siderophages were present. There was no mitotic activity and pleomorphism (Fig. 3). Following rehabilitation and analgesics, the ankle regained full range of motion at three months. At one-year follow up, there was residual aching which was tolerable.

Discussion

Pigmented villonodular synovitis is an uncommon, slow-growing, benign and locally invasive tumour of the synovium. In early literature, there was much confusion about the nomenclature and many different names given for the disease.³ In 1941, Jaffe et al⁹ proposed a unified classification noting that these were different

* Registrar

** Consultant

Department of Orthopaedic Surgery

*** Consultant

Department of Pathology and Laboratory Medicine

Tan Tock Seng Hospital

Address for Reprints: Dr Low Chee Kwang, Department of Orthopaedic Surgery, Tan Tock Seng Hospital, Moulmein Road, Singapore 308433.



Fig. 1. Gadolinium enhanced sagittal MRI of the ankle showing the proximal-distal extent of the lesion. There is no evidence of articular involvement.

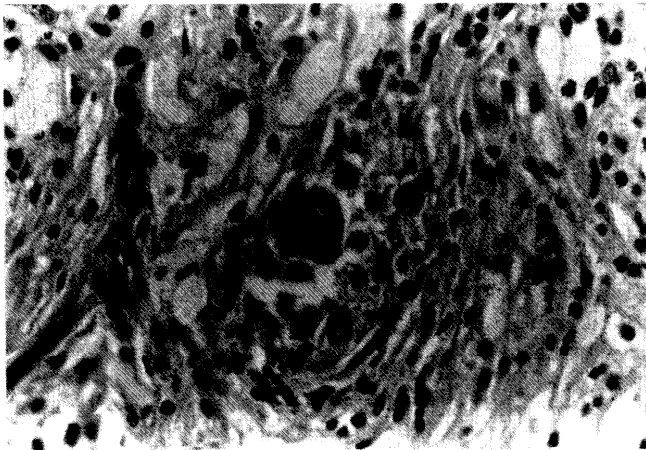


Fig. 3. High power histological section of the mass demonstrating multinucleated giant cell, spindle cells and lipid laden foam cells.

manifestations of the same disease affecting synovial lined tissues such as joints, bursa and tendon sheaths. They named it pigmented villonodular synovitis (PVS), pigmented villonodular bursitis (PVB) and pigmented villonodular tenosynovitis (PVTs). Granowitz et al¹⁰ introduced two distinct clinical forms namely the localised or pedunculated lesions (LPVS) and the diffuse form (DPVS).

Pigmented villonodular synovitis commonly presents with a mass or joint swelling. Occasionally there may be episodic attacks of pain associated haemarthrosis in the joint.⁴ Joint instability, subluxation and limitation of motion were reported in aggressive lesions of the knee where severe bone invasion was noted.¹¹ When the hip and ankle were involved, pain was marked due to the relatively small intraarticular space.¹² Most extraarticular lesions present initially as small, painless masses that slowly enlarge. They may cause mechanical pain as they

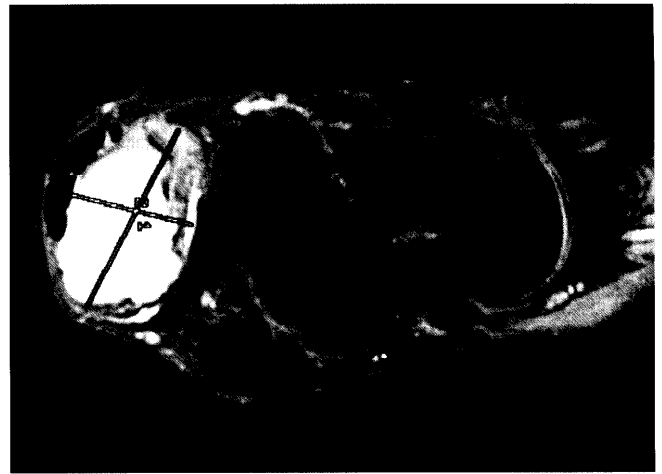


Fig. 2. Gadolinium enhanced horizontal MRI showing the retrocalcaneal extent of the lesion. The tendoachilles is being displaced postero-laterally. There is also no evidence of intraarticular extension.

enlarge or invade the adjacent structures.¹³ Growth is influenced by anatomical location. Lesions in the joint expand inwards whereas those on the tendon grow outwards and mold along the tendon.² The clinical behaviour is influenced by the anatomical site.⁴ Lesions in different confined spaces give rise to problems such as carpal tunnel syndrome¹ and spinal neurological symptoms.¹⁴ In this patient, the slow-growing retrocalcaneal mass enlarged rapidly following trauma. We attribute this to intralesional haemorrhage.

Radiographic evaluation of PVS is by plain films and MRI. Arthrogram is invasive and changes are non-specific.¹⁵ Rao et al¹⁶ reviewed 81 patients, 70% of the plain radiographs showed abnormalities ranging from soft tissue swelling to bone erosion. The characteristic changes on plain films are grouped into 3 classes: (a) absent or minimum, consisting of synovitis; (b) an expanded synovial sac, superficial osseous erosion and cyst; or (c) extensive, consisting of diffuse non-calcifying synovial tumefactions of lobular outline and varying density.³ MRI is the most effective, non-invasive technique to define and characterise the mass. It is able to depict site, size, shape and extent of the soft tissue mass. Intraarticular extension may be highlighted with contrast.¹⁷ Haemosiderin was known to alter magnetic susceptibility of the synovium, shorten T2 relaxation time and loss of signal in T2 weighted images. This is helpful in confirming the diagnosis.⁴

The aetiology of these lesions is still unsettled. The classic cytoarchitecture consists of subsynovial nodular proliferation of large round, polyhedral, or spindle cells with prominent cytoplasm and pale nuclei.³ The more peripheral areas of these nodules and surrounding stroma contain lipid-laden foam cells and multinucleated giant cells interspersed with hemosiderin laden cells which are secondary response.³ The centrifugal growth pattern

and the distinct difference between the lesional tissue and the adjacent hyperplastic synovial tissue suggest that it is a neoplasm.¹⁶ Jaffe et al^{2,3,9} in 1941 proposed that PVS was a reactive process as ° of the patients had history of antecedent trauma. However, hemosiderotic synovitis as seen in haemophilia and chronic synovitis caused by rheumatoid arthritis and trauma do not have distinct submembranous nodules composed of proliferating mononuclear and giant cells as seen in a pigmented villonodular synovitis.¹⁶ There is also relatively insignificant degrees of inflammation and lack of iron deposits in the centre of the proliferating mass to support the theory of traumatic reactive theory.¹⁶

The prognosis of giant cell tumour of digital tendon sheath is excellent after complete excision than other forms of PVS.¹² Recurrence is related to the ability to completely excise the lesion. All limited procedures had a high recurrence rate. Histological findings cannot predict the possibility of recurrence.¹⁸ We performed a marginal excision of the lesion as marginal excision of the nodular form (LPVS) gave satisfactory results with relieve of symptoms and minimal recurrence.”

REFERENCES

1. Chidgey L K, Szaboa RM, Wiese DA. Acute carpal tunnel syndrome caused by pigmented villonodular synovitis of the wrist. *Clin Orthop* 1988; 228:254-7.
2. Enzinger F M, Weiss S W. Benign tumours and tumourlike lesion of synovial tissue. In: Enzinger F M, Weiss SW, editors. *Soft Tissue Tumours*. 3rd ed. Missouri: Mosby-Year Book Inc, 1995:638-58.
3. Flandry F, Hughston J C. Pigmented villonodular synovitis. *J Bone Joint Surg* 1987; 69A:942-8.
4. Flaundry F, McCann S B, Hughston J C, Kurtz D M. Roentgenographic findings in pigmented villonodular synovitis of the knee. *Clin Orthop* 1989; 247:208-19.
5. Nilsson U, Moberger G. Pigmented villonodular synovitis of the joints: Histological and clinical problems in diagnosis. *Acta Orthop Scand* 1969; 40:448-60.
6. Sawmiller C J, Turowski G A, Sterling A P, Dudrick S J. Extra-articular pigmented villonodular synovitis of the shoulder. *Clin Orthop* 1997; 335:262-7.
7. Myers B W, Nasi A, Feigenbaum S L. Pigmented villonodular synovitis and tenosynovitis. A clinical epidemiological study of 166 cases and literature review. *Medicine* 1980; 59:223-38.
8. Jones F E, Soule E H, Coventry M B. Fibrous histiocytoma of synovium (giant cell tumour of the tendon sheath). A study of one hundred and eighteen cases. *J Bone Joint Surg* 1969; 51A:76-86.
9. Jaffe H L, Litchenstein L, Sutro C J. Pigmented villonodular synovitis, bursitis and tenosynovitis: A discussion of the synovial and bursa equivalents of the tenosynovial lesion commonly denoted as xanthoma, xanthogranuloma, giant cell tumour or myeloplaxom of the tendon sheath, with some consideration of the tendon sheath lesions itself. *Arch Pathol* 1941; 31:731-8.
10. Granowitz S I, D'Antonio J, Mankin H L. The pathogenesis and long term end results of pigmented villonodular synovitis. *Clin Orthop* 1976; 114:335-51.
11. Anderson J A, Ladefoged C. A case of aggressive pigmented villonodular synovitis. *Acta Orthop Scand* 1988; 59:467-70.
12. Byers P D, Cotton R E, Deacon O W, Lowy M, Newman P H, Sissons H A. The diagnosis and treatment of pigmented villonodular synovitis. *J Bone Joint Surg* 1968; 50B:290-305.
13. Walling A K, Gasser S I. Soft tissue and bone tumours about the foot and ankle. *Clin Sports Med* 1994; 13:909-38.
14. Gezen F, Akay K M, Aksu A Y, Beduk S N. Spinal pigmented villonodular synovitis: A case report. *Spine* 1996; 21:642-5.
15. Dorwart R H, Genant H K, Johnston W H, Morris J M. Pigmented villonodular synovitis of the shoulder: Radiological-pathologic assessment. *Am J Radio* 1984; 143:886-8.
16. Rao A S, Vigorita V J. Pigmented villonodular synovitis giant cell tumour of the tendon sheath and synovial membrane. A review of eighty-one cases. *J Bone Joint Surg* 1984; 66A:76-94.
17. Ugai K, Morimoto K. MRI of pigmented villonodular synovitis in subtalar joint: a case report. *Clin Orthop* 1992; 283:281-4.
18. Schwart H S, Unni K K, Pritchard D J. Pigmented villonodular synovitis: a retrospective review of affected large joints. *Clin Orthop* 1988; 247:243-55.