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Hemosiderotic Synovitis of Hip

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Abstract

Background: Hemosiderotic synovitis is a rare and chronic synovial disorder caused by recurrent hemorrhages within the joint. It leads to significant structural alterations, often progressing to chronic osteoarthritis. Typically presenting as a monoarticular disorder with pain and restricted range of motion, it is most commonly observed in adult males, with the knee joint being the most frequently affected site. The predominant causes include hereditary bleeding disorders, followed by trauma. *Case Report*: We present a case of hemosiderotic synovitis of the hip joint in a 63-year-old female without any history of bleeding diathesis. The patient's clinical presentation included progressive hip pain and restricted movement. Arthroscopic evaluation played a crucial role in diagnosis and management, allowing direct visualization of the pathology, symptom relief, and tissue sampling for histopathological confirmation. *Conclusion*: Early recognition of this distinct subtype of hemosiderotic synovitis and an understanding of its potential underlying causes can lead to prompt diagnosis, significantly reduced morbidity, and improved patient outcomes.

Keywords: Arthroscopy, Hemorrhage, Hemosiderin, Hemosiderosis, Synovitis.

Introduction

Synovium is a specialized mesenchymal tissue lining the inner surface of the joint capsule. It consists of the surface lining of 2-3 layers of flat synoviocytes overlying loose connective tissue with collagen, fat, and blood vessels [1]. Hemosiderotic synovitis refers to the deposition of hemosiderin into the synoviocytes and the connective tissue of the synovium, and it is attributed to chronic intra-articular hemorrhage. The common aetiologies include bleeding diathesis, trauma, oral anticoagulant use, degenerative joint disorders, pigmented villonodular synovitis, and synovial hemangioma [2,3]. The most commonly affected joint is the knee in an adult male and joint stiffness and restriction of movement are the common presenting complaints. Radiological examination and synovial fluid analysis are commonly employed in the evaluation, but histopathological examination remains to be the gold standard for the diagnosis [1,2]. We present an unusual case of hemosiderosis involving the hip joint of a 63-year-old female causing joint pain and restriction of movement.

Case Report

A 63-year-old diabetic female presented with a six-month history of progressive right hip pain. Over the past three months, the pain had worsened, accompanied by stiffness and restricted movement, significantly impacting her daily activities. Clinical examination revealed stiffness in the right hip with hypertonicity of the iliopsoas muscle. Radiographs demonstrated early osteoarthritic changes. Joint aspiration showed sterile synovial fluid, with no evidence of mycobacteria. Serological tests for antinuclear antibodies and rheumatoid factor were negative, and C-reactive protein levels were normal.

An open synovial biopsy was performed for definitive diagnosis. Intra-operatively, the synovium exhibited patchy rusty discoloration. Histopathological analysis revealed focal papillary structures lined by synoviocytes overlying a fibro-collagenous stroma, with brown granular pigment within synoviocytes and pigment-laden macrophages aggregated in the stroma **[Fig.1]**. The pigment stained positively with Perl's Prussian blue, confirming it as hemosiderin **[Fig.2]**. Additional findings included foci of entrapped bony spicules, lymphocytes, plasma cells, and lymphoid aggregates, with no evidence of nodular proliferation or osteoclast-like giant cell aggregates. These findings confirmed a diagnosis of hemosiderotic synovitis. The patient was managed conservatively with physiotherapy. Over the course of one month, she reported significant improvement in pain and mobility.

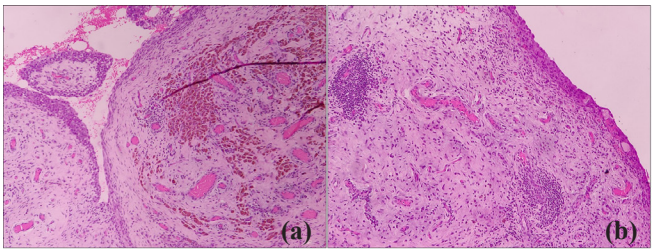

Fig.1: (a): *Synovial lining with sub-synovial stroma showing aggregates of hemosiderin-laden macrophages.* **(b):** *Foci of neo-vascularisation with lymphoid aggregates and plasma cell infiltrate indicating a chronic pathology were noted (H&E, 100X).*

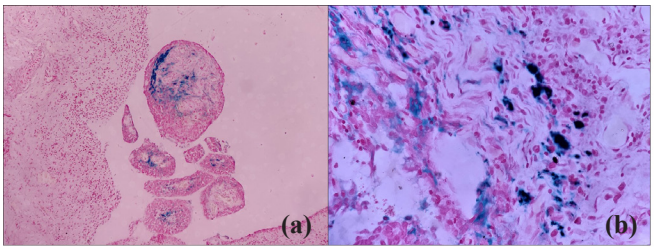

Fig.2: (a,b): *Sub-synovial hemosiderin deposits stained blue with Perl's Prussian blue stain (100X). The deposits were fine and granular within the lining synoviocytes, while coarse and lumpy in the sub-synovial macrophages (200X).*

Discussion

Hemosiderotic synovitis presents insidiously like chronic synovitis. It is usually monoarticular and limited to synovium sparing the underlying articular cartilage and bone. Recurrent or chronic intra-articular hemorrhage leads to the formation of hyperplastic vascular tissue within the synovium. The hemoglobin is broken down and the iron is deposited in the form of granular brown hemosiderin pigment, within the synoviocytes as well as stromal aggregates of hemosiderin-laden macrophages. The resultant synovium shows rusty discoloration and fibrosis. The amount of hemosiderin deposition increases in proportion to the amount and episode of intra-articular hemorrhage [4,5]. Iron deposits in the synovium are associated with the increase of pro-inflammatory cytokines like interleukins (IL-1, IL-6, tumor necrosis factor) which are responsible for hypertrophy, recruitment of lymphocytes, and macrophages. Elaboration of matric metalloproteinases inhibits the formation of cartilage matrix leading to degenerative changes in the articular cartilage in long-standing cases [6].

The most common cause of hemosiderotic synovitis is an inherited bleeding disorder, such as hemophilia. Other reported causes include joint trauma, use of oral anticoagulants, degenerative joint conditions like osteoarthritis, autoimmune disorders such as rheumatoid arthritis and collagen vascular diseases, as well as metabolic and vascular conditions like hemochromatosis, pigmented villonodular synovitis, synovial hemangioma, and hemoglobinopathies including sickle cell disease [1-3]. It is seen in young to middle-aged males with the knee being the most commonly involved joint. Shoulder and hip joint involvement is sparsely documented in the literature [1,3,7,8]. The present case is unusual in the age of presentation at 63-years and the involvement of the hip joint. Patients experience a gradual onset of pain, restricted movement, and joint effusions. The diagnostic approach involves a careful history, physical examination, radiological,

and laboratory examination to rule out chronic infections, autoimmune diseases, and degenerative joint diseases. Arthroscopy and tissue biopsy examination can be used to rule out localized synovial pathologies like synovial chondromatosis, pigmented villonodular synovitis, or synovial hemangiomas [1,5]. On radiological examination, hemosiderotic synovitis can appear as synovial hypertrophy to concentric joint space narrowing. Magnetic resonance imaging studies may show similar hyperplasia, which is hypointense on T1W and hyperintense on T2W with pigmented villonodular synovitis is a close differential [4,5,7].

Arthroscopic examination shows a red-brown or rusty discoloration of synovium, along with hypertrophy and fibrosis. Such gross appearance is similar in hemosiderotic synovitis and pigmented villonodular synovitis and can be differentiated based on the histopathological features. Hemosiderotic synovitis shows hemosiderin granules in the synovial lining along with aggregates of hemosiderin-laden macrophages in the subsynovial connective tissue, while pigmented villonodular synovitis is a proliferative lesion characterized by nodular proliferation of synovium with epithelioid synoviocytes arranged in a sheet-like manner in the subsynovial region, abundant osteoclast-like giant cells with hemosiderin-laden cells [1-3]. Arthroscopy in such cases is a simple, reliable, and minimally invasive technique, which allows for localization of the lesion and helps in the assessment of its effect on the bone and cartilage. An added advantage is obtaining specimens for the pathologic and microbiological examination to exclude the differential diagnosis [4,9,10].

Conclusion

Hemosiderotic synovitis presenting in the elderly is a rare occurrence. There are numerous clinical differentials in such cases and require an immaculate clinical, radiological, and pathological approach for diagnosis. The pathogenic role of iron in the development of fibrosis and secondary degenerative joint disease is well documented making it imperative to diagnose early, identify etiology, and prompt treatment.

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References

1. O'Connell JX. Pathology of the synovium. Am J Clin Pathol. 2000;114(5):773-784.
2. Jayalakshmi V, Chikhale NP, Mishra A, Cherian S. Nonhemophilic hemosiderotic synovitis of the knee: A case report and review of literature. Indian J Pathol Microbiol. 2014;57(3):473-475.
3. France MP, Gupta SK. Nonhemophilic hemosiderotic synovitis of the shoulder: a case report. Clin Orthop Relat Res. 1991;262:132-136.
4. Yalçin N, Bektaşer B, Çiçekli Ö, Uğraş S, Doğan M. An unusual cause of recurrent joint effusions: Nonhemophilic hemosiderotic synovitis of the knee. Acta Orthop Traumatol Turc. 2010;44(2):162-165.
5. Deshmukh SD, Khandeparkar SGS, Khadilkar MS, Nakul S, Naik P, Giakwad Y. Idiopathic Unilateral monoarticular hemosiderotic synovitis of knee joint mimicking pigmented vilonodular synovitis – an unusual case. Indian J Pathol Res Pract. 2015;4(1):27-29.
6. Melchiorre D, Manetti M, Matucci-Cerinic M. Pathophysiology of hemophilic arthropathy. J Clin Med. 2017;6(7):63.
7. Abrahams TG, Pavlov H, Bansal M, Bullough P. Concentric joint space narrowing of the hip associated with hemosiderotic synovitis (HS) including pigmented villonodular synovitis (PVNS). Skelet Radiol. 1988;17:37-45.
8. Bartlett J, Lidder SS, Bucknill AT. Haemosiderotic synovitis secondary to anticoagulant use: An unusual mechanism of failure of a unicompartmental knee replacement. Case Rep Orthop. 2019;2019:1-5.
9. Ohdera T, Tokunaga M, Hiroshima S, Yoshimoto E, Matsuda S. Recurrent hemarthrosis after knee joint arthroplasty: Etiology and treatment. J Arthroplasty. 2004;19(2):157-161.
10. Krebs VE. The role of hip arthroscopy in the treatment of synovial disorders and loose bodies. Clin Orthop Relat Res. 2003;(406):48-59.

