CASE REPORT

Testicular cholesterol granuloma: a diagnostic surprise in an uncommon site

Savitri M. Nerune[1], Deepak Kumar Chavan[2], Yogeshwar Kalla[1], Sayandeep K. Das[1]*

[1]Department of Pathology, [2]Department of Surgery, Shri B. M. Patil Medical College, BLDE (Deemed to be University), Vijayapura-586103 (Karnataka), India.

Abstract

This case report outlines an unusual presentation of a cholesterol granuloma in the testis, an uncommon site of such a pathology. A male in his fifties, with chronic left groin swelling, was initially suspected to have a pyocele or scrotal abscess based on preliminary investigations. The swelling's longstanding nature and ultrasonography findings led to orchidectomy, with a significant evacuation of pus. However, histopathological examination revealed testicular cholesterol granuloma characterized by distinct features. This case emphasizes the significance of a comprehensive differential diagnosis for enduring swellings and emphasizes the pivotal role of histopathological examination in confirming rare presentations.

Keywords: Testicular Cholesterol Granuloma, Uncommon Presentation, Testicular Swelling

Introduction

A cholesterol granuloma is a benign, non-neoplastic lesion typically found within the petrous apex, middle ear, or mastoid process. Histologically, it is characterized by cholesterol clefts within a granulomatous inflammatory reaction, often accompanied by hemosiderin deposition and irregular clear-appearing spaces surrounded by histiocytes or multinucleated giant cells [1]. Cholesterol crystals are formed as a result of chronic or recurrent hemorrhage, which leads to an inflammatory response when blood degradation products, particularly cholesterol, incite a foreign body reaction [2, 3].

While cholesterol granulomas are more frequently encountered in areas such as the petrous apex, middle ear, or mastoid process, their emergence in the testis is remarkably infrequent. The precise pathogenesis of a cholesterol granuloma remains elusive, although the current understanding suggests that a non-infectious local response triggers consequent granulomatous reactions and eventual scarring. The introduction of cholesterol crystals provokes a foreign-body response involving massive inflammatory cells, culminating in the formation of granulomatous tissue [3, 4].

The clinical presentation of a cholesterol granuloma can be misleading, as it is often indistinguishable from that of more common conditions, such as hydrocele, hernias, or tumors. This necessitates the need for a differential diagnosis in cases presenting with groin swelling or masses.

This case offers an opportunity to discuss this rare entity and reinforces the need for histopathological analysis for the diagnosis of such unusual conditions. The unexpected identification of a cholesterol granuloma in a patient presenting with long-standing swelling of the groin underscores the importance of considering a wide differential diagnosis when dealing with similar presentations.

Case Report

A male patient in his fifties presented with

swelling in the left groin region for the past two years. He had no history of any associated pain or fever, and did not report any noticeable changes in the size of the swelling.

Upon physical examination, the left hemiscrotum was enlarged and the skin over the swelling was normal, with no signs of erythema or inflammation. The swelling was non-tender on palpation and not reducible. The patient's vital signs were stable. Ultrasonography of the scrotum suggested a diagnosis of left-sided pyocele/scrotal abscess. A clinical diagnosis of pyocele was made and orchidectomy was considered.

Intraoperatively, two litres of pus was drained. A partly cut open sac-like orchidectomy specimen measuring 13x9.5x6 cm was sent for histopathological examination (Figure 1). The patient tolerated the procedure well and remained stable postoperatively. On gross examination, the external surface was found to be encapsulated and congested. Gritty sensation was felt while grossing, and large necrotic areas with focal pale white areas were noted (Figure 2).

Sections were obtained from representative areas, and the slides were stained with hematoxylin and eosin. Microscopy revealed a fibrocollagenous

Figure 1: Intraoperative photograph showing 2 liters pus drained

Figure 2: Gross photograph of cut surface showing large necrotic areas with focal white areas (Arrowhead)

cyst wall and well-formed cholesterol granulomas comprising many needle-shaped cholesterol clefts surrounded by lymphocytes, plasma cells, histiocytes, and multinucleated foreign body giant cells (Figure 3). Large areas of necrosis, fibrosis, and fibrocollagenous tissue with mixed inflammatory cell infiltrate comprised neutrophils, lymphocytes, plasma cells, and hemosiderin-laden macrophages along with congested blood vessels. Foci of atrophied and necrosed seminiferous tubules, along with epididymal tissue, were also observed (Figure 4).

Discussion

Cholesterol granulomas are primarily found in regions like the petrous apex, middle ear, or mastoid process, and they are characterized by unique cholesterol-filled vacuoles within an inflammatory granulomatous response [4]. The incidence of these occurrences in testicles remains unclear. The manifestation in the testis, as observed in our patient's case, underscores both their infrequent nature and the complexities inherent in diagnosing such atypical presentations [5, 6].

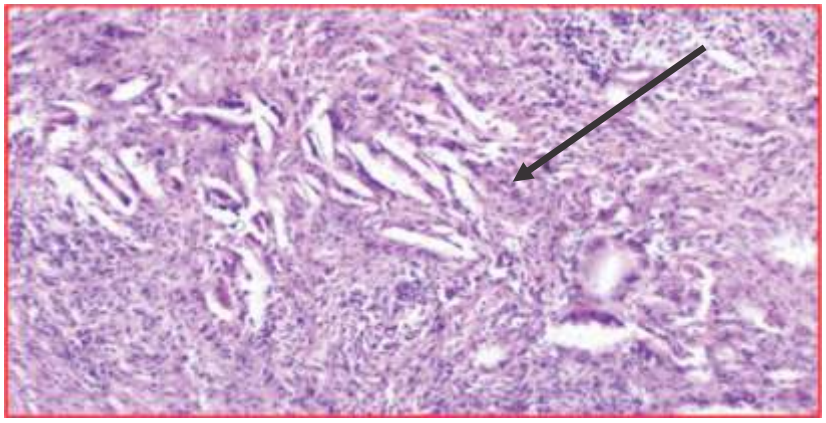

Figure 3: Photomicrograph showing cholesterol clefts (Arrowhead) surrounded by multinucleated foreign body giant cells, lymphocytes, plasma cells and hemosiderin-laden macrophages suggestive of cholesterol granuloma (H&E, 200×)

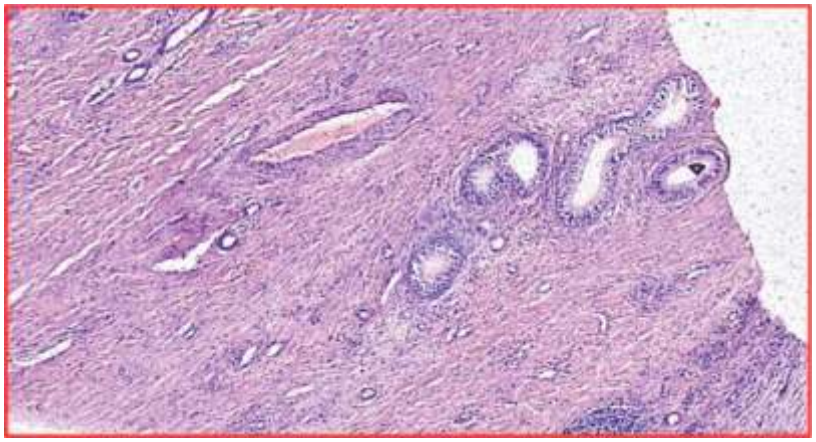

Figure 4: Photomicrograph showing epididymal tissue (H&E, 200×)

The current understanding of its pathogenesis leans towards a non-infectious local response, leading to the formation of characteristic granulomatous tissue over time. The release of blood elements, including cholesterol and hemosiderin, from compromised vessels induces a foreign body reaction, thereby involving inflammatory giant cells [2, 3].

The decision to pursue orchidectomy was based on a clinical evaluation backed by imaging assessments. However, a definitive diagnosis only emerged after histopathological analysis of the orchidectomy specimen. This underlines the necessity of considering an expansive range of differential diagnoses in clinical scenarios marked by persistent ambiguous swellings.

Hydrocele is among the first differentials that come to mind in cases of painless scrotal swelling. In such instances, a physical examination often reveals a positive transillumination test, contrasting with cholesterol granulomas [4]. Additionally, the ultrasonography finding of a scrotal abscess or pyocele highlights another differential. These are typically accompanied by clinical signs of infection such as pain, warmth, and redness, helping differentiate them from our case [7].

Given their malignant nature and potential severity, testicular tumors are vital considerations. Factors such as patient age, associated risk factors, and ultrasound features can assist clinicians in distinguishing them from benign swellings [8]. Epididymitis, marked by its painful presentation, suggests inflammation possibly due to bacterial involvement or other causes [9]. Hernias, especially those presenting from the inguinal region and extending into the scrotum, must be distinguished from isolated testicular swellings [10]. Lastly, even if the patient lacks acute pain, the grave implications of conditions, such as testicular torsion, make them an essential consideration.

This breadth in differential diagnoses, spanning from benign to life-threatening conditions, reinforces the challenges clinicians face, especially when faced with rare entities. This narrative emphasizes the crucial role of histopathological analysis in situations where clinical and imaging findings may be equivocal.

Drawing from existing literature, it is evident that testicular cholesterol granulomas are seldom encountered, which amplifies the importance of such case studies in enhancing our collective clinical knowledge. This case not only underscores the need for clinicians to maintain a broad differential mindset but also reinforces the unparalleled role histopathology plays in deciphering such rare clinical puzzles.

Conclusion

Persistent and unexplained groin swelling should prompt the consideration of a broad differential diagnosis, including rare conditions such as cholesterol granulomas of the testis, particularly when common conditions such as hydrocele or scrotal abscess fail to fully explain the clinical presentation. Histopathological examination remains crucial in confirming such rare diagnoses, as clinical and imaging findings are often nonspecific and may lead to misdiagnosis. Cholesterol granulomas, which are typically encountered in areas such as the petrous apex, middle ear, or mastoid process, can manifest exceptionally in unusual locations, such as the testis. A thorough understanding of their pathogenesis and histological features can aid clinicians in making an accurate diagnosis. Timely surgical intervention, such as orchidectomy in this case, is pivotal for managing complications and preventing further morbidity.

References

1. Shrirao N, Mukherjee B, Krishnakumar S, Biswas J. Cholesterol granuloma: a case series & review of literature. *Graefes Arch Clin Exp Ophthalmol* 2016; 254(1):185-188.
2. Raghavan D, Lee TC, Curtin HD. Cholesterol Granuloma of the Petrous Apex: A 5-Year Review of Radiology Reports with Follow-Up of Progression and Treatment. *J Neurol Surg B Skull Base* 2015; 76(4): 266-271.
3. Isaacson B. Cholesterol granuloma and other petrous apex lesions. *Otolaryngol Clin North Am* 2015; 48(2): 361-373.
4. Unal D, Kilic M, Oner S, Erkinuresin T, Demirbas M, Coban S, *et al*. Cholesterol granuloma of the paratesticular tissue: A case report. *Can Urol Assoc J* 2015; 9(5-6): E390-392.
5. Kundargi VS, Patil NA, Patil SB, Biradar AN, Ranka KS, Desai AS. Persistent mullerian duct syndrome in a post orchideopexy patient with gyanaecomastia and hypospadias: A case report. *J Krishna Inst Med Sci Univ* 2015; 4(3):101-104
6. SreeRamulu PN, Srinivasan D, Katti P, Madhu. Persistent mullerian duct syndrome presenting as transverse testicular ectopia [TTE] rarest of rare: A case report. *J Krishna Inst Med Sci Univ* 2015; 4(4):110-115.
7. Nishio H, Iwatsuki S, Takada H, Kobayashi T, Mizuno K, Okada A, *et al*. Scrotal abscess mimicking as intra-scrotal liposarcoma. *Urol Case Rep* 2018; 23:62-64.
8. Song G, Xiong GY, Fan Y, Huang C, Kang YM, Ji GJ, *et al*. The role of tumor size, ultrasonographic findings, and serum tumor markers in predicting the likelihood of malignant testicular histology. *Asian J Androl* 2019; 21(12):196-200.
9. Michel V, Pilatz A, Hedger MP, Meinhardt A. Epididymitis: Revelations at the convergence of clinical and basic sciences. *Asian J Androl* 2015;17(5):756-763.
10. She HL, Lam KC, Wong KK, Lam WWM. Urinary bladder inguinal hernia: An uncommon cause of scrotal swelling. *Hong Kong Med J* 2014; 20(4):351.e1-2.

***Author for Correspondence:**

Dr. Savitri M. Nerune, Department of Pathology, Shri B.M. Patil Medical College, BLDE (Deemed to be University), Vijayapura-586103

Email: savitri.nerune@bldedu.ac.in Cell: 9008179806

How to cite this article:

Nerune SM, Chavan DK, Kalla Y, Das SK. Testicular cholesterol granuloma: A diagnostic surprise in an uncommon site. *J Krishna Inst Med Sci Univ* 2024; 13(4):180-184.

***Submitted:** 04-July-2024 **Accepted:** 04-Sep-2024 **Published:** 01-October-2024*