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Case Report

Scrotoliths in the Testicular Tunica Vaginalis in an Elderly Male Cadaver: Clinical Implications

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Abstract

Scrotoliths, or "scrotal pearls," are calcified fibrous loose bodies found within the tunica vaginalis, often seen during radiological evaluation or autopsies. Chronic inflammation due to trauma, parasitic infestations, and torsion and subsequent detachment of the appendices of the testis or epididymis are postulated mechanisms suggested for their formation. They are benign but can mimic a tumor. Scrotoliths can be diagnosed with high-resolution ultrasonography. Here, we report a case in which, during routine dissection, two scrotoliths were found within the tunica vaginalis of the left testis in an elderly male cadaver. Histologically, the central portion of the scrotoliths exhibited concentric collagen lamellae that enclosed calcified remains of tissue debris. There were no arterioles, venules, or microfilarial larvae seen within them. Awareness about the histological findings can help understand the mechanism that led to their formation.

Keywords

scrotolith, scrotal pearl, scrotal calculus

INTRODUCTION

Scrotoliths, or 'scrotal pearls' are calcified fibrous loose bodies found within the tunica vaginalis of the testis; they are often associated with hydrocele. They are found attached to the parietal layer of the tunica vaginalis. They are usually smaller than 1×1 cm in dimension, with a reported incidence of 3.0%–4.3% across the literature.[1] Scrotoliths are often detected as incidental findings during ultrasonography (USG) or surgery. Conventional USG can detect them, but high-resolution USG can narrow the differential diagnosis. Typical sonographic findings are a hyperechoic focus with distal acoustic shadows, with or without a fluid background (depending on whether or not it is associated with hydrocele).[1,2] In professional mountain riders, chronic inflammation due to repeated microtrauma and, in some others, filarial infestations are commonly considered to be causal.[3] Some have linked it with the torsion of the appendices of the testis or epididymis and their subsequent detachment.[4] Scrotoliths are benign but may rarely be associated with an underlying mesothelioma of the testis.[5]

CASE REPORT

Here, we present a case in which two small, hard masses were found within the cavity of the tunica vaginalis (TV) of the left testis during routine cadaveric dissection of a 63-year-old male cadaver. The masses were lying in the small fossae of the left TV cavity near the inferior pole. One was pyramidal in shape, and the other was ovoid ***(Figs 1A, 1B)****. Measurements were taken with digital Vernier calipers and an electronic weighing balance. All the measurements are shown in* ***Table 1****.*

The tissue was processed for paraffin embedding without subjecting it to the decalcification process. Histological

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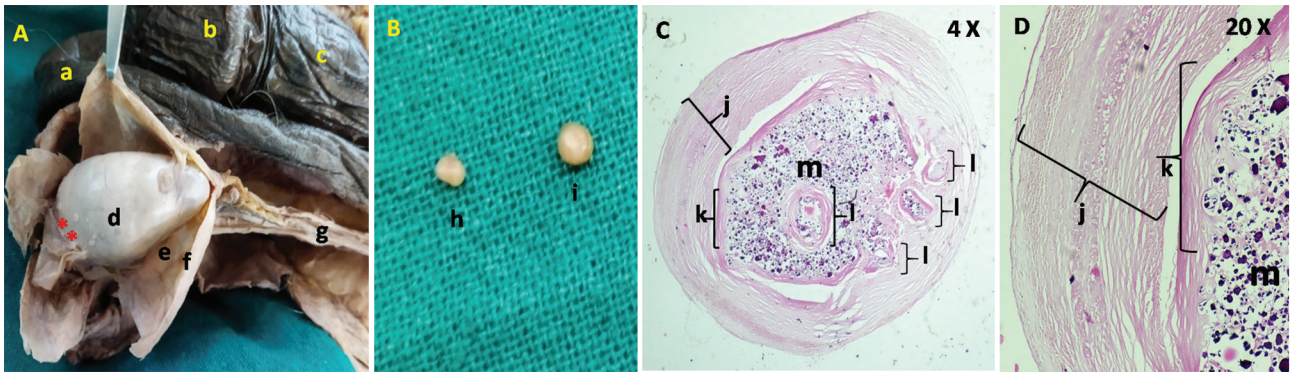

Figure 1. Gross and micro-anatomical features of scrotal pearls. **A**. Location of scrotal pearls in the tunica vaginalis cavity marked with red asterisk; **B**. Scrotal pearls seen as hard, glistening, whitish to pearly white coloured, pyramidal and oval bodies; **C, D**. H&E stained sections of the scrotal pearls where concentric fibrous lamellae were seen ensheathing smaller similar lamellar bodies with calcified contents in the core of the lamellae appearing as purplish black flakes; **a**: scrotum; **b**: glans penis; **c**: shaft of the penis; **d**: visceral layer of the left tunica vaginalis; **e**: tunica vaginalis cavity; **f**: parietal of the left tunica vaginalis; **g**: spermatic cord; **h**: pyramidal scrotal pearl; **i**: ovoid scrotal pearl; **j**: outer concentric fibrous lamellae; **k**: larger lamellar body; **l**: smaller lamellar bodies; **m**: calcified necrotic contents.

Table 1. Size and weight of the two scrotoliths

	Size	Weight
Small pyramidal	0.23 cm × 0.17 cm	0.17 g
Large ovoid	0.42 cm × 0.35 cm	0.29 g

examinations were performed using hematoxylin and eosin (H&E), periodic acid-Schiff (PAS), and Masson's trichrome (MT) staining techniques.[6] Macroscopic and microscopic photography was done with a Nikon D5600 and a Nikon Eclipse Ci Penta Head microscope attached to a Nikon DS-Fi3 microscopic camera, respectively. Sections stained with H&E revealed an outermost fibrocellular capsule-like layer containing spindle-shaped cells having heterochromatic to intermediately euchromatic nuclei and scanty cytoplasm. Thereafter, there were inner concentric, lightly eosinophilic, fibrous lamellae ***(Figs 1C, 1D)****. The central core of the masses contained densely basophilic, heterogenous granules within an eosinophilic matrix. No parasitic ova or larvae were seen. PAS-stained sections showed that the fibrous lamellae were light pink in color and the heterogeneous granules at the core of the fibrous body were dark purple in color* ***(Figs 2A, 2B)****. The PAS reaction demonstrates carbohydrates in tissue sections in bright red or magenta color. Color formation occurs due to the reaction of the Schiff reagent with aldehyde groups formed by the oxidation of certain tissue carbohydrates and glycogen by periodic acid.[6] It also stains mucin, basement membrane, reticulin, mucopolysaccarides and various other mucosal substances. It stains differentially depending on the content of PAS-positive substances.* ***Figs 2A, 2B*** *demonstrate a heterogeneous calcified core in a dark purple color, which indicates a moderate PAS positive reaction, probably due to glycoproteins in the necrotic core. In the MT-stained sections, fibrous lamellae appeared green, and the core granules appeared dark purple* ***(Figs 2C, 2D)****.*

DISCUSSION

During routine cadaveric dissection, we found two scrotoliths in the tunica vaginalis of the left testis. Scrotoliths have been recorded in medical literature for nearly a century, but their etiopathogenic mechanisms are still mostly unknown. During the early 20th century, Kickcham described a giant scrotolith that he had found in a patient.[7] In 1928, Meyer coined the term 'corpora libera testis'. These days, high resolution and high penetrance USG used in the clinical evaluation of a scrotal mass readily help in differentiating scrotoliths from other benign and malignant conditions.[8] The size of the scrotolith varies from a few millimeters to centimeters.[9] Their gross appearance is solid, firm to touch, flattened, ovoid, or spherical in shape. The two masses in our case were hard and smooth. They have been reported to reside in shallow depressions on the epididymis, over the layers of the testis, and in the sinus of the testis, though most of them are found lying freely in the cavity of the tunica vaginalis, like in our case. Scrotolith formation is attributed to repeated or chronic inflammation, which leads to fibrosis within the TV and other soft tissues of the testis. The end result is defective drainage via lymphatic channels from the TV testis cavity, which can be a nidus for calculus formation. It might also be due to the degeneration of pedunculated appendices of the testis and epididymis due to inadequate blood supply.

In our case, the cells in the fibrous capsule of the scrotoliths were likely to have been fibroblasts and fibrocytes, as per their morphology.[10] The fibrous lamellae appeared to be collagenous.[11] The basophilic heterogenous granules in the core were likely to be calcified proteinaceous material that may have occurred due to necrosis at the core of the scrotoliths. Calcified tissue deposits are usually seen in purple-blue H&E-stained sections. H&E is not an ideal stain to demonstrate calcium in tissues. One ideal stain

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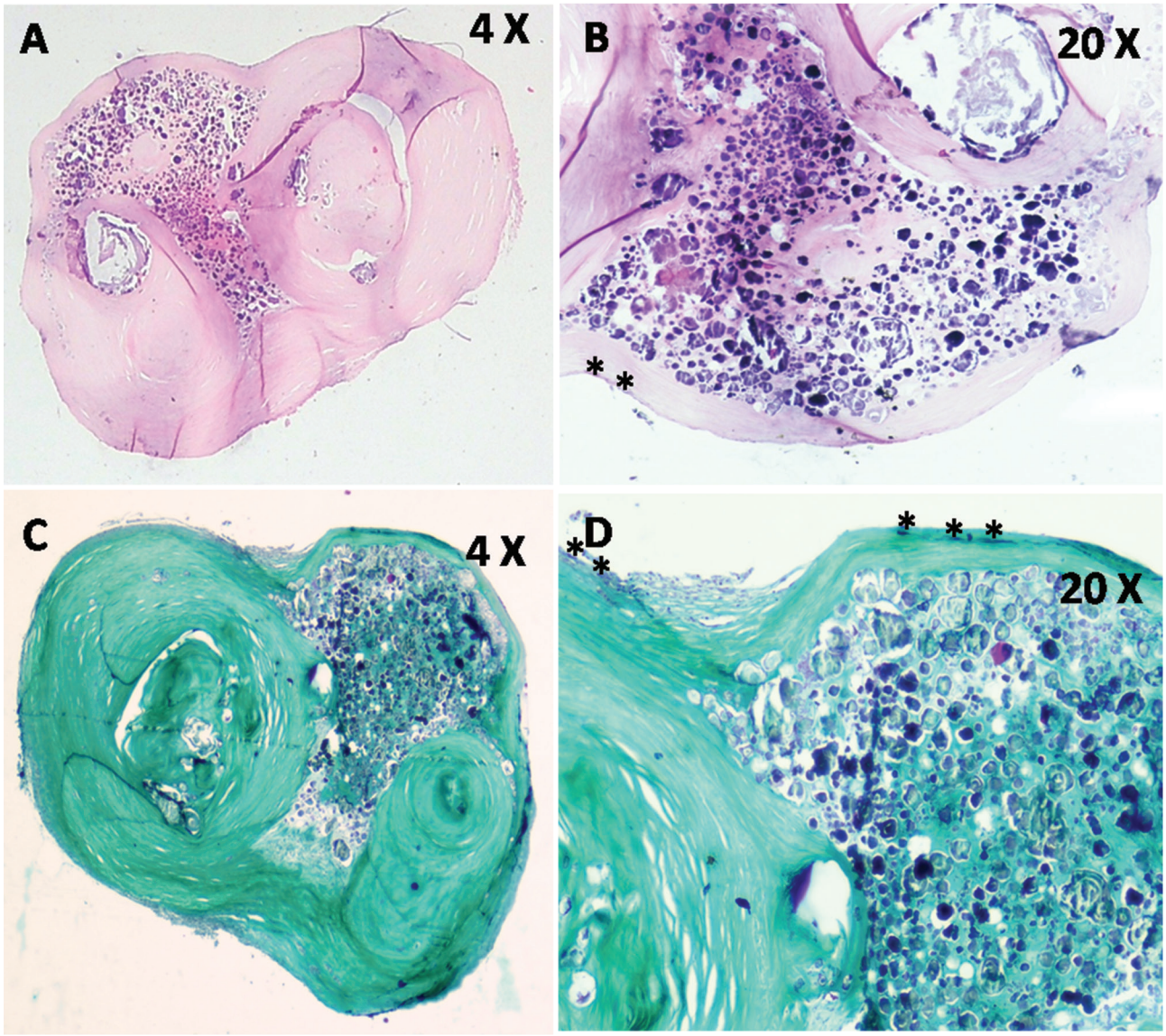

Figure 2. **A**, **B**. Photomicrographs of periodic acid-Schiff stained section of a scrotal pearl showing concentric fibrous lamellae in light pink and heterogeneous calcified core in dark purple colour; **C**, **D**. photomicrographs of Masson's trichrome stained section of scrotal pearl showing fibrous lamellae in green and calcified contents in dark purple. Black asterisks denote the outermost cellular layer.

would have been the Alizarin red S method when used at pH 4.2, which shows calcium in an orange-red color. The alternative for calcium demonstration in tissue section is von Kossa method that uses silver salts that stain calcium black, and this method is generally preferred for routine demonstration of calcium in paraffin sections.[6] We had to rely on commonly available stains, i.e., H&E, MT, and PAS, for the demonstration of calcium in the tissue, which is a limitation of our study. The cause of necrosis may be the paucity of vasculature that we observed in them. The inflammatory conditions that lead to hydrocele have also been associated with scrotoliths.[12] In our case, there was no significant history that could be elicited from the available medical records regarding the profession of the individual or the history of parasitic infestations. Even though filariasis is still found in some pockets of India[13], and it could have been the cause in this case, we did not see any chronic inflammatory cells, microfilarial larvae, or ova. A prior microfilarial infestation could be ruled out with immunological tests of the tissue[14] and by detecting anti-microfilarial antibodies in the serum. Further, we did not find any suggestions of mesothelial or other tumors within both testes.[15] In the present case, the scrotoliths may not have been symptomatic and would not have contributed to the death of the patient. Scrotoliths are usually benign, but some are believed to be associated with mesothelioma of the tunica vaginalis testis and therefore these should be thoroughly investigated. Employing specific ultrasonography and magnetic resonance imaging, one can have a fair idea about tissue characteristics and can accurately narrow down the differential diagnoses to establish a definitive diagnosis.

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Скротолиты во влагалищной оболочке яичек (tunica vaginalis) у трупа пожилого мужчины: клинические последствия

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Резюме

Скротолиты, или „мошоночные жемчужины", представляют собой кальцинированные фиброзные рыхлые тела, расположенные в tunica vaginalis, часто обнаруживаемые во время рентгенологического исследования или аутопсии. Хроническое воспаление из-за травмы, паразитарных инвазий, а также перекрута и последующего отсоединения придатков яичка или эпидидимиса являются постулируемыми механизмами для их образования. Они доброкачественные, но могут имитировать опухоль. Скротолиты можно диагностировать с помощью ультрасонографии высокого разрешения. Здесь мы сообщаем о случае, когда во время рутинного вскрытия были обнаружены два скротолита в tunica vaginalis левого яичка у пожилого мужского трупа. Гистологически центральная часть скротолитов имела концентрические коллагеновые пластинки, которые заключали кальцинированные остатки тканевого детрита. Внутри них не было обнаружено артериол, венул или личинок микрофилярий. Осведомлённость о гистологических результатах может помочь понять механизм, который привёл к их образованию.

Ключевые слова

скротолит, мошоночная жемчужина, мошоночный камень

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