Scrotalcalcinosis: Case Series Diagnosis and Surgical Management

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ABSTRACT

Aim & Objectives: Idiopathic scrotal calcinosis is an uncommon benign disorder of the scrotal skin characterized by multiple calcified intradermal nodules that occur with normal calcium and phosphate metabolism. The pathogenesis of scrotal calcinosis is still controversial. Metabolic and hormonal workup is required to rule out other causes. Surgical excision is required both for confirming the diagnosis as well as for treatment. In this study, we report four cases in our setup.

Methods: In this study, four cases of idiopathic scrotal calcinosis were diagnosed in the Department of Surgery, G.R. Medical College, Gwalior, from June 2022 to May 2023. Surgical excision of the lesion with primary closure was done.

Result: The patients were discharged on the 7th post-op day, and no neoplastic changes were seen in the resected specimen. The histology of the excised specimen showed dense fibrosis of the dermis with foci of calcifications.

Conclusion: Scrotal calcinosis is an uncommon disease with multiple scrotal nodules which is amenable to excision and direct closure, complete excision of even the smallest lesion is required to minimize recurrences.

Keywords: Idiopathic Calcinosis, Scrotal Cysts, Scrotum, Surgery.

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Introduction

Idiopathic scrotal calcinosis is an uncommon benign disorder of the scrotal skin characterized by multiple calcified intradermal single nodules or multiple nodules of different sizes that occur in the presence of normal calcium and phosphate metabolism. Historically, it was first reported by Lewinski in 1883 and named idiopathic scrotal calcinosis by Shapiro in 1970.[1] It is benign and common in the third decade of life. Calcium salt deposition, also known as calcium buildup, is caused by the deposition of insoluble calcium salt crystals 7.

Patients usually present because of concern about cosmesis and itching which adversely affect their quality of life. Other reported presentations include pain, superimposed infection, and exudation of chalky substances.[2] There is no underlying metabolic disorder with normal serum calcium, phosphate, and parathyroid hormone levels.[3]

Imaging studies such as CT scans will show calcifications in the scrotal wall[4] but are usually not needed as the diagnosis is mainly clinical and confirmed with histology of excised nodules.

Surgery is the treatment approach, and it is to reduce symptoms and improve cosmesis.[5] This involves en bloc excision of the scrotal wall containing the nodules with/or selected excision of each nodule.[2]

Aim

The pathogenesis of scrotal calcinosis is still controversial. Our aim is to report this disease and

review the pathogenesis and surgical management.
To determine whether or not there is a defect in calcium and phosphate metabolism.

Material and Methods

In our study, four cases of idiopathic scrotal calcinosis were diagnosed in the Department of Surgery, G.R. Medical College, Gwalior, from June 2022 to May 2023.

The patient's age ranged from 24 to 60 years (Mean 42 years). All the patients presented with scrotal swelling that is progressively increasing in size with multiple nodules on the scrotum [**Figure 1**] and were clinically diagnosed with sebaceous cysts. Only one case presented with two nodules. While other remaining cases presented multiple nodular swellings. There was no history of trauma, pain, itching, fever, or metastasis. No other comorbidity. but one case of feared cancer presented in cancer opd from where he was referred to our department.

On local examination, the penis was well-developed and the urethral opening was free from redness and discharge. The scrotal skin showed multiple nodular swelling on scrotum were seen, skin over the swelling is thin with nodules varying in size from as small as" rice grains" to as large as "broad beans," with some nodules fusing with each other and nodules were intradermal with yellowish discolouration and no neoplasm at the anus, no abnormality detected in anal finger examination.

Nodules range from 0.5 to 2.5 cm in size [**Figure 2**]. The largest was about 25 mm in size. Mostly bilateral. While in case 4 Foul smelling serosanguinous discharge was present. Lymphnode in the right inguinal area was palpable solitary 1*1cm, firm, non-tender, freely mobile, smooth surface.

Case	Age (in years)	Presentation	Clinical Diagnosis	Number of nodules
1	24	Scrotal swelling	Sebaceous cyst	Multiple
2	27	Scrotal swelling	Sebaceous cyst	Multiple
3	60	Scrotal swelling	Sebaceous cyst	Multiple
4	42	Scrotal swelling with ulcer	Epididymo Orchitis with haematocele	Two

Table 1: Showing presenting features

Features	Case 1	Case 2	Case 3	Case 4
Age	24	27	60	42
Calcium level [8.4-10.2]	Within Normal range -9.1	Within Normal range-9.5	Within Normal range-10	Within Normal range-9.7
Phosphate levels [2.7-4.5]	Normal	Normal	Normal	Normal
white chalky discharge	present	Present	present	Pus discharging ulcer
Duration of swelling	3yr	5yr	7yr	1yr
Inguinal lymphadenopathy	-	-	-	present

Table 2: Demographic features and Diagnostic evaluation

Figure 1: Preoperative: multiple cysts Present over scrotum.

Informed consent was obtained from all patients to participate in this study for an excision biopsy of the scrotal nodules and for the educational and academic use of any photographic images taken in the pre-, peri- or postoperative period.

The procedure was done under spinal anaesthesia. The patient was positioned supine, and the site was cleaned with povidone-iodine and draped. The scrotum was inspected, and all nodules were noted considering each hemiscrotum as a unit.

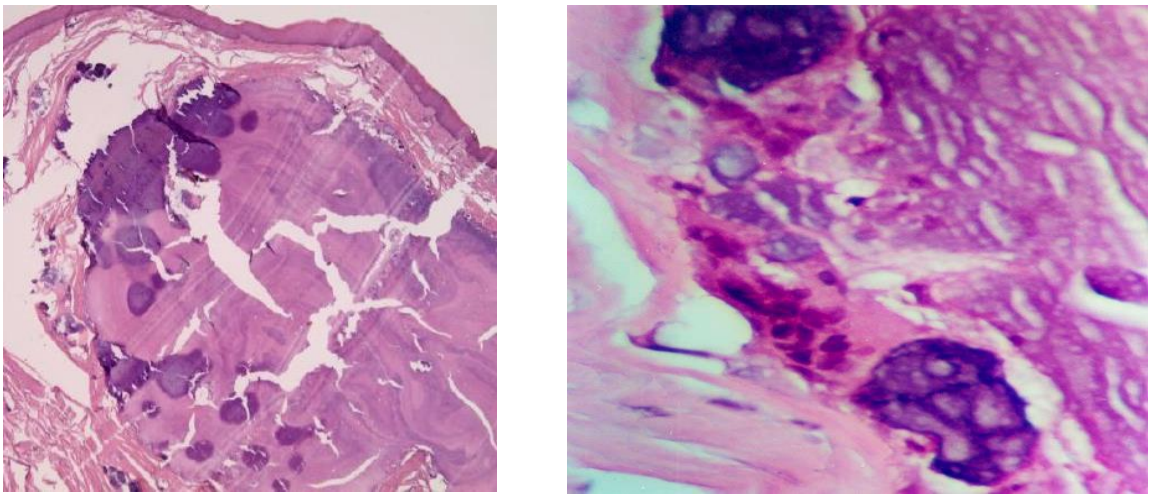
A wide local excision of the involved scrotal skin was made removing the nodules en block while taking each hemiscrotum as a unit in two patients. In one patient nodules are scattered so selected excision of each nodule was done. This required a semielliptical incision on the lateral aspects and a vertical paramedian raphe incision on the medial aspects. Dissecting was just below the dermis so as not to disrupt the dartos muscle layer which was spared. In addition 4th Case, a right orchidectomy was done, for haematocele with epididymo-orchitis.

The defect was then closed with prolene 3-0 using an interrupted suture (**Figure 2**). Postoperatively antibiotics and dressing were done. And the patient was discharged on the 5th pod. All the patients after excision of lesions treated with topical steroids for 2 weeks, followed by vitamin A for 6 months. Patients followed up to 3, 6, and 12 postoperative months.

Figure 2: Scrotum 7th day post scrotoplasty of case 2.

FNAC of inguinal lymph node -Scanty clear aspirate, no cells seen. HPE- Fine granules can be seen in the dermis and large irregular calcium masses can be seen in the subcutaneous tissue stained dark blue with HE staining & black with vonkossa staining.

The histology of the excised specimen showed dense fibrosis of the dermis with foci of calcifications surrounded by multinucleated giant cells of the foreign body type. The overlying epidermis was normal confirming the diagnosis of scrotal calcinosis.(**Figures 3(A)–3(B))**



Figures: 3(A)–3(B)) The diagnosis of scrotal calcinosis.

12 months post excision at follow-up, the natural laxity and configuration of the scrotum had returned and the patient was satisfied with the outcome.

Discussion

ISC is a rare benign disease and misdiagnosed characterized by multiple calcified nodules without any impairment of calcium and phosphorus metabolism[2], and is rare in clinical practice. ISC may be the result of local inflammation leading to a sudden increase in collagen synthesis around blood vessels and fat, which subsequently causes massive calcium deposition, or these lesions may be considered to

be the result of calcium deposition around the granulomatous reaction in the dermis.[2]

Most patients present for cosmetic reasons. Most of the patients in this series between 20-40 years of age had the initial nodules supporting the observation that it tends to occur in the third decade.[8] Scrotal calcinosis is more common in dark-coloured race[3] and affects mainly male but similar lesions (vulvar calcinosis) has been reported in female.[4]

The examination findings of multiple firms, intradermal, non-tender nodules of different sizes and brownish in colour (hypopigmented in dark skin) are the typical examination findings.[2] There is usually no associated inguinal lymphadenopathy as was observed in most of the cases supporting the benign nature of the condition. It may considerably affect a patient's quality of life. Unusual presentations include pedunculated forms and perineal/supra-pubic pain consistent with chronic prostatitis.[5]

The absence of an underlying abnormality in calcium metabolism in idiopathic scrotal calcinosis[3] was also observed as the serum calcium, and phosphate levels of all the patients were normal.

This could be excising each nodule separately using elliptical incisions or en bloc as a wide local excision or a combination of both techniques.[2,9,10] The aim is to preserve adequate scrotal skin for reconstruction and so maintain the scrotal function.

Most authors reported no postoperative complications and satisfactory or good cosmetic outcomes after surgical excision and primary closure.

The nodules vary in number and can be solitary or multiple. Dombale et al. have described 220 nodules in a single case.[6] These lesions are usually asymptomatic. Rare occurrences of itching and chalky white discharge have been reported.[2] Most of the cases in this series have presented with scrotal swelling. Out of four cases, one also had a history of white chalky discharge from the lesions.

Pompeo et al. (multiple nodules) reported no recurrence at 3 months of follow-up.[2] Both Khallouk et al. (multiple nodules) and Tsai et al. (single nodule) reported no recurrence at 12 months of follow-up.[7,13] No recurrence was seen in our case at 12 months of follow-up.

The largest international case series is of 14 cases, by Shapiro et al.,[8] which suggests an idiopathic origin for this condition, similar to most of the cases in this series. According to Wollina U, Schönlebe J, França K, and Tchernev G Study, there are some differential diagnoses of idiopathic scrotal calcinosis. Multiple epidermal cysts of the scrotum[6-8], sebaceous cysts[9], steatocystoma multiplex.[10] Larger cysts need surgery; smaller ones can be subjected to laser therapy with either carbon dioxide or diode laser.[10-12] A linear nick with a radiofrequency electrode works well in enucleating the cysts intact as long as they are not melded together with the surrounding tissue.[12] same as we did with one of our patients.

The complete surgical excision of the lesion and a variety of reconstructive repair techniques such as direct closure, transfer scrotal flap, or skin grafting are chosen according to the scrotal defect to achieve a better postoperative appearance and satisfactory results, thus gaining the understanding and acceptance of the patient.[10] Therefore, surgical treatment is the only recommended treatment modality for ISC, and its main indications for surgical excision are the presence of clinical symptoms (pruritic symptoms, presence of white material discharge, etc.) and/or the patient's expectation of a poor appearance.[11]

Topical use of vitamin A actively repairs skin. Improvement in roughness, dysplasia, atypia, and reduction in wrinkling are some of its effects.[14] Topical steroids represent the treatment of choice for many types of inflammatory dermatoses. As we used these drugs in our patients and observed

no recurrence. Despite the extensive use of this class of drugs as first-line therapy, the mechanism of their action is uncertain. However, they can act as powerful anti-inflammatory agents.[13]

The postoperative course was uneventful and the cosmetic result was excellent. No recurrence was observed after a 12-month follow-up period.

Conclusion

Surgical excision is the treatment of choice and has an excellent prognosis, excision should be based on the extent of the nodules and must include even the smallest nodules to avoid rapid recurrence, diagnosis, and sexual improvement reported by the patients. Topical vitamin A and Topical steroids help in early healing and overall good outcomes.

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