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Case report

Calcinosis cutis at a rare site: A case report.

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Abstract

Background:

Calcinosis cutis is characterized by deposition of insoluble calcium salts, including hydroxyapatite and calcium phosphate, within the skin and subcutaneous tissue. It may be dystrophic, metastatic, iatrogenic, or idiopathic. Involvement of the malleolar region is uncommon and may clinically simulate a calcified soft-tissue or bony lesion. This case report aims to highlight the diagnostic value of clinicoradiological, cytological, and histopathological correlation in an unusual presentation of calcinosis cutis.

Case presentation:

A 49-year-old male presented with a hard, non-tender, non-mobile swelling measuring approximately 2 × 2 cm over the right lateral malleolus for 10 years. There was no history of pain or discharge. Hematological and biochemical investigations, including complete blood count, serum calcium, and phosphorus, were within normal limits. Radiography showed a lobulated bony outgrowth projecting from the right lateral malleolus. Fine needle aspiration yielded chalky white material. Cytology demonstrated mononuclear cells, multinucleated giant cells, multiple calcifications, and phosphate crystals in a fern pattern. Surgical excision showed a skin-covered specimen measuring 3 × 2 × 1.5 cm with yellow and grey-white gritty areas. Histopathology revealed stratified squamous epithelium with underlying nodular deposits of basophilic amorphous calcification in fibrous connective tissue, confirming calcinosis cutis.

Take-away lessons: Long-standing, firm subcutaneous swellings at uncommon sites should not be presumed to be bony or cartilaginous lesions. Chalky white aspirate on fine needle aspiration is an important diagnostic clue. Normal serum calcium and phosphorus levels support an idiopathic form after exclusion of systemic, traumatic, and iatrogenic causes.

Conclusion:

Calcinosis cutis should be considered in the differential diagnosis of unusual calcified subcutaneous lesions. Integrated clinical, radiological, cytological, and histopathological assessment helps avoid misdiagnosis and guides appropriate management.

Keywords: *Calcinosis cutis; Fine needle aspiration cytology; Idiopathic calcinosis; Malleolus; Subcutaneous calcification; Histopathology*
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Introduction

Calcinosis cutis refers to the deposition of insoluble calcium salts in the skin and subcutaneous tissues. The deposits are composed predominantly of calcium phosphate in hydroxyapatite form and may occur in association with local tissue injury, altered calcium-phosphate metabolism, medical procedures, or without any identifiable systemic cause [1].

The condition is traditionally divided into dystrophic, metastatic, iatrogenic, and idiopathic types. Dystrophic calcification occurs in damaged or degenerated tissue, metastatic calcification is linked to disturbances in calcium or phosphorus metabolism, and iatrogenic calcification follows treatment-related calcium deposition. Idiopathic calcinosis cutis is uncommon and is diagnosed when no metabolic, traumatic, or procedural cause is detected [1,3]. Commonly reported sites include the scrotum, vulva, penis, and breast, whereas calcinosis involving the malleolar region is rare [4]. Because such lesions may present as firm, slowly enlarging nodules, they can be clinically and

radiologically mistaken for chondroma or other calcified soft-tissue tumors. A case of calcinosis cutis is reported, presenting as a long-standing swelling over the right lateral malleolus, with confirmation by fine needle aspiration cytology and histopathology.

Case presentation

A 49-year-old male presented with a swelling over the right lateral malleolus that had been present for 10 years. The swelling measured approximately 2 × 2 cm, was hard in consistency, non-tender, and non-mobile. There was no history of pain or discharge. Complete blood counts, serum calcium, and serum phosphorus values were within normal limits.

Radiography showed a lobulated bony outgrowth projecting from the right lateral malleolus (Figure 1). Clinically, the lesion was suspected to be a chondroma. Fine needle aspiration cytology was performed using a 22-gauge needle, and chalky white material was aspirated. Smears were stained with hematoxylin and eosin, Papanicolaou, and Giemsa stains. Cytology showed moderate cellularity with a few mononuclear cells and multinucleated giant cells, along with multiple calcifications and phosphate crystals arranged in a ferning pattern (Figures 2 and 3). A cytological diagnosis of calcinosis cutis was made.

The patient was advised of surgical excision. The excised specimen was skin-covered and measured 3 × 2 × 1.5 cm (Figure 4). Cut section showed yellow and grey-white areas with a gritty sensation during sectioning (Figure 5). The tissue was decalcified for two days and processed for hematoxylin and eosin staining.

Histological sections showed stratified squamous epithelium with multiple nodular deposits of basophilic amorphous calcification in the underlying tissue, along with fibrous connective tissue (Figures 6 and 7). Based on cytological and histopathological correlation, the final diagnosis was calcinosis cutis, most consistent with an idiopathic type in the absence of metabolic abnormality, trauma, hospitalization, or relevant procedural history.

Follow-up and post-excision clinical condition

The lesion was surgically excised and confirmed as calcinosis cutis on histopathology. Post-excision wound status and long-term recurrence details were not documented in the provided case notes. Clinical follow-up is advisable because recurrence after excision remains variably reported in the literature [6].

Figures

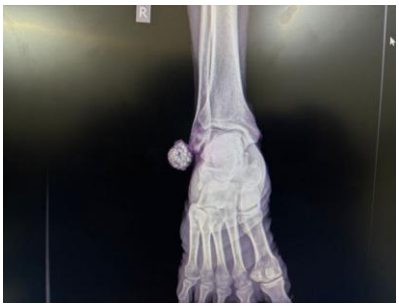

Figure 1: X-ray showing a lobulated bony outgrowth projecting from the right lateral malleolus.

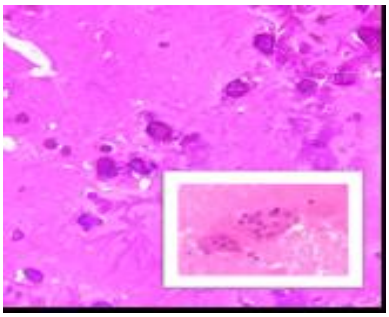

Figure 2: Giemsa-stained smear, 40×, showing multiple calcifications and phosphate crystals; inset shows multinucleated giant cells.

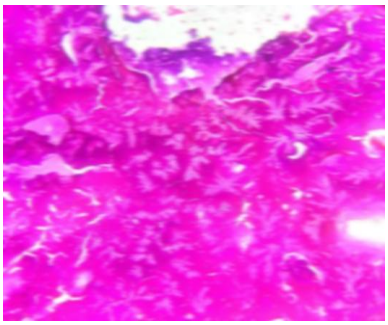

Figure 3: H&E-stained smear, 40×, showing calcification and phosphate crystals in a fern pattern.

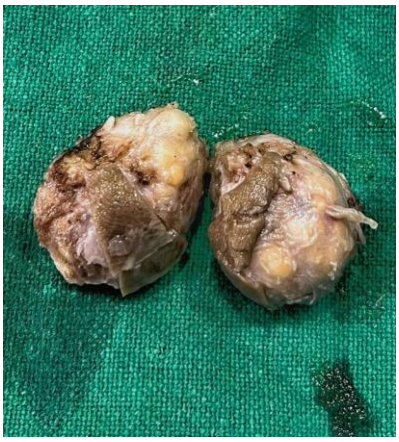

Figure 4: Gross examination showing two skin-covered firm-to-hard tissue bits.

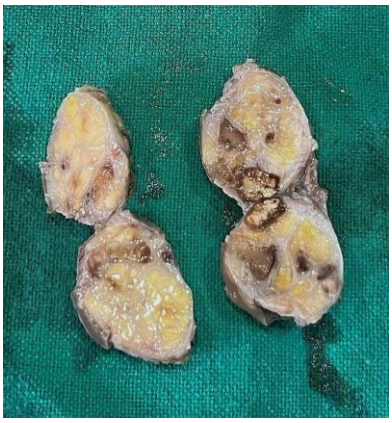

Figure 5: Cut section showing yellow and grey-white areas with calcification.

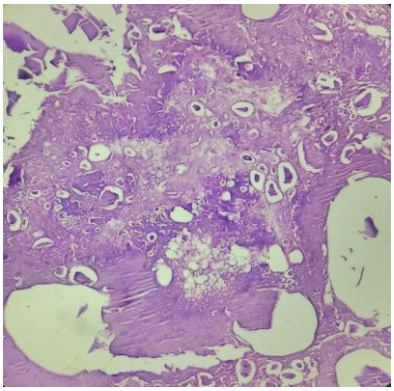

Figure 6: H&E section, 10×, showing nodular deposits of basophilic amorphous calcifications.

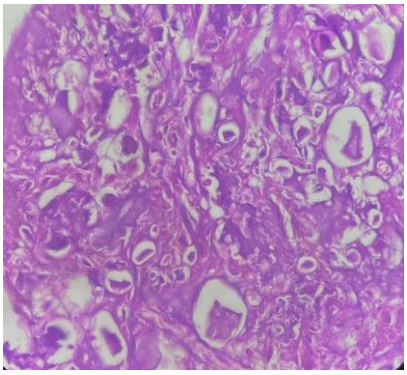

Figure 7: H&E section, 40×, showing multiple nodular deposits of basophilic amorphous calcifications.

Discussion

Calcinosis cutis was originally described by Virchow in 1855 [2]. The condition is characterized by calcium salt deposition in the skin or subcutaneous tissue and is classified as dystrophic, metastatic, iatrogenic, or idiopathic depending on the underlying mechanism [1]. Dystrophic calcification occurs in necrotic or previously damaged tissue and may follow trauma or inflammation. Metastatic calcification is usually associated with systemic disorders such as chronic renal failure or altered calcium-phosphate homeostasis. Iatrogenic calcinosis cutis develops secondary to therapeutic or diagnostic procedures, whereas idiopathic calcinosis cutis occurs without an identifiable systemic, traumatic, or procedural trigger [1,3].

Idiopathic calcinosis cutis is rare. It includes tumoral calcinosis, which usually presents as periarticular masses around large joints in otherwise healthy adolescents, and subepidermal calcified nodules, which are more often described in children and may occur over the head or extremities [3]. The exact pathogenesis is uncertain. One proposed mechanism involves abnormal metabolism of gamma-carboxyglutamic acid, an amino acid with calcium and phospholipid-binding properties, resulting in deposition of calcium phosphate within the skin [2].

Fine needle aspiration cytology is useful when the aspirate is chalky, white, and granular. Smears may show amorphous calcific material, phosphate crystals, foreign-body type giant cells, and a variable inflammatory cell component [1,5]. In the present case, the cytological impression of calcinosis cutis was subsequently confirmed on histopathology, highlighting the value of FNAC in the preoperative assessment of calcified subcutaneous lesions.

The differential diagnosis of a calcified subcutaneous lesion includes calcified fibrous pseudotumor, calcified epidermal cyst, sarcoidosis, tuberculosis, lymphoepithelial lesion, pilomatricoma, osteitis fibrosa cystica, and extraskeletal osteosarcoma [5]. Radiologically and clinically, the present lesion was suspected to be a chondroma because of its firm nature and lobulated appearance near the malleolus. Normal serum calcium and phosphorus levels, absence of trauma, and lack of an underlying systemic disorder favored an idiopathic form of calcinosis cutis.

Medical treatment options, including bisphosphonates, intralesional corticosteroids, aluminum hydroxide, warfarin, and diltiazem, have been tried with variable and often limited success [3]. Surgical excision remains an effective option for localized symptomatic or diagnostically uncertain lesions, although delayed wound healing and recurrence have been described [6]. Patients should therefore be counseled about the possibility of recurrence and should be followed clinically after excision.

Conclusion

This case emphasizes that calcinosis cutis can occur at unusual sites such as the malleolar region and may mimic a calcified bony or soft-tissue tumor. A chalky white granular aspirate on FNAC should alert the pathologist to the possibility of calcinosis cutis. Histopathological confirmation and clinicobiochemical correlation are important, particularly when metabolic investigations are normal, and there is no history of trauma or previous procedure.

Limitations

This report describes a single case; therefore, the findings cannot be generalized to all patients with calcinosis cutis. Long-term post-excision follow-up and recurrence details were not available.

Advanced imaging or special staining was not performed, which may have further characterized the lesion. The diagnosis was based on clinicobiochemical, cytological, and histopathological correlation in the available clinical context.

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Recommendations

Calcinosis cutis should be considered in the differential diagnosis of firm, long-standing subcutaneous swellings, even when located at uncommon sites. Fine needle aspiration cytology can provide an early diagnostic clue when chalky white material is obtained. Baseline biochemical assessment, including serum calcium and phosphorus, should be performed to exclude metabolic causes. Localized lesions may be managed by surgical excision when clinically indicated, followed by periodic surveillance for wound healing and recurrence.

Abbreviations

CBC - Complete blood count
FNAC - Fine needle aspiration cytology
H&E - Hematoxylin and eosin
PAP - Papanicolaou stain

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Conflict of Interest

The authors declare no conflict of interest.

Availability of Data

Data are available from the corresponding author on reasonable request, subject to institutional and patient confidentiality requirements.

Consent for Publication

Written informed consent for publication should be obtained from the patient before journal submission.

Author contribution

Dr. Nalla Mamatha contributed to case evaluation, cytological interpretation, and manuscript preparation. Dr. Sravanthi Gurugubelli contributed to pathology review, diagnostic correlation, and manuscript drafting. Dr. P. Sandya Rani Guruvelli contributed to specimen processing, histopathological interpretation, and literature review. Dr. Shaik Adeeba Fathima contributed to case data organization, figure compilation, and reference formatting. Dr. Atla Bhagya Lakshmi supervised the diagnostic workup, provided conceptual guidance, critically revised the manuscript, and approved the final version. All authors should review and approve the final manuscript before submission.

Author Biography

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