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Pathology in Focus

Calcium oxalate granuloma of the nose of a chronically dialysed nephritic patient

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Abstract
The patient was a 54-year-old woman who had been suffering from chronic tubulo-interstitial nephritis for about seven years, requiring haemodialysis. More recently, she developed a polypoid mass in the left nasal cavity causing discomfort on breathing and slight epistaxis. The tumour was of gritty consistency and measured 28 × 8 × 5 mm. Microscopy showed a lobulated almost cystic structure composed of granulation tissue with comparatively few plasma cells and many multinucleated giant cells lining the spaces filled with crystalline deposits of calcium oxalate.

Key words: Nose; Granulation; Calcium Oxalate; Renal Failure, Chronic

Introduction

Granulomas of the nose and paranasal sinuses may be caused by specific and non-specific agents. The chronic specific infectious granulomas of the nose constitute a variety of often rare diseases. The non-specific granulomas include foreign-body granulomas and some endogenous granulomas like the cholesterol granuloma.[1]

We describe an unusual, possibly unrecognised, endogenous calcium oxalate granuloma in the nose of a uraemic woman undergoing haemodialysis treatment.

Material and methods

Excised tissue was fixed in formol-saline and embedded in paraffin and sectioned for light microscopy. This was accompanied by a characteristic gritty sound on cutting. The sections were routinely stained with haematoxylin-eosin, van Gieson's and von Kossa's methods; and periodic acid-schiff (PAS); and were examined under polarized light. Immunohistochemical tests included various markers for cytokeratins (CK8; AE1/AE3); epithelial membrane antigen (EMA), vimentin and CD68.

Case report

A 54-year-old woman suffering from chronic uraemic tubulo-interstitial nephritis for seven years, and on intermittent haemodialysis treatment for five years, noted some breathing difficulty and slight epistaxis caused by a slowly growing tumour in her left nostril. This was excised under local anaesthesia and measured 28 × 8 × 5 mm. The yellow-coloured tissue felt firm on touch because of the gritty material in the fibrous stroma.

Microscopy of the sectioned gritty surface of the excised lesion showed cystic structures and solid granulomatous areas (Figure 1). The granulation tissue lining the cysts contained many foreign body type multinucleated giant cells, histiocytes and inflammatory cells in some fibrous tissue (Figure 2). The significant microscopical feature was

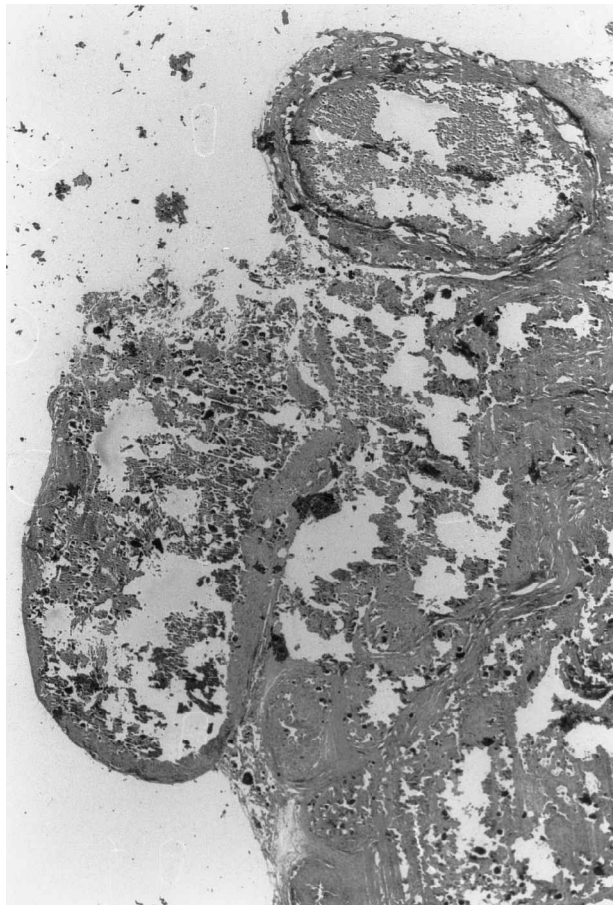

Fig. 1
Sectioned gritty surface of the lesion shows cyst-like structures surrounded or partly filled by granulation tissue (H&E; × 6)

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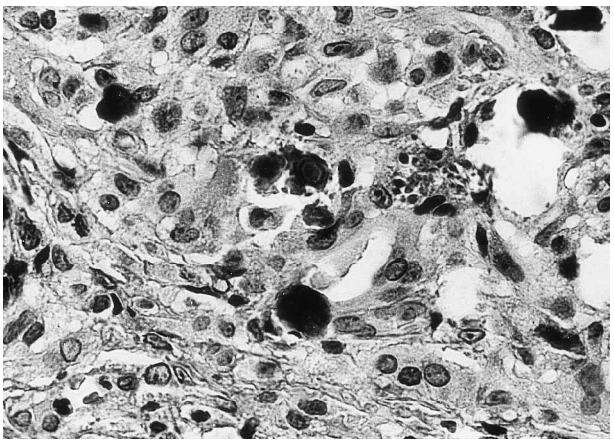

FIG. 2

Lining of a cyst by granulation tissue containing many multinucleated giant cells and granular calcified matter, also in histiocytes or lying loosely in the fibrous tissue (H&E; × 1000)

the presence of calcium oxalate crystals of various sizes and shapes. Ovoid and rhomboid crystalloids prevailed, scattered widely in the granuloma (Figure 3). Larger psammoma-like structures, though resistant to fine sectioning, were recognized in large numbers. Some were fragmented (Figure 4); others were joined up and formed bizzare structures frequently near the surface (Figure 5).

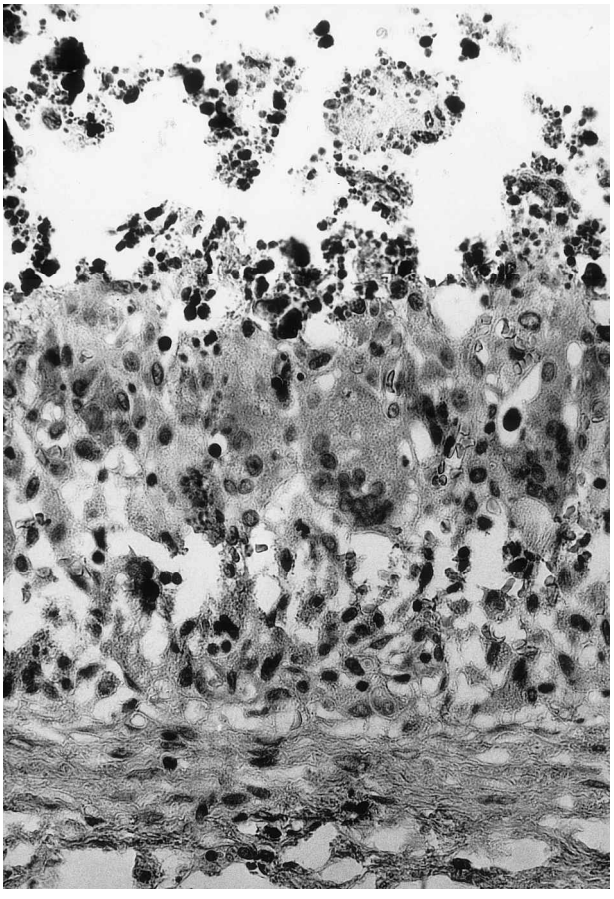

FIG. 3

Ovoid and rhomboid calcium oxalate crystalloids in the granulation tissue (H&E; × 1000)

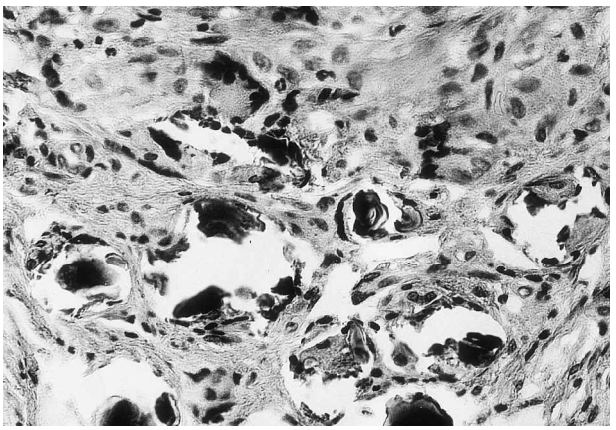

FIG. 4

Large numbers of lamellated crystalloids often forming psammoma-like structures (H&E; × 625)

Immunohistochemically the epithelioid cells were positive for vimentin, CK8 and CD68 but they were negative for high molecular cytokeratins (AE1/AE3) and EMA. Cells regularly expressing vimentin and CD68 were located near the calcospherules positive with von Kossa's stain. There was some haemosiderin dispersed in the granulation tissue.

Biochemical results included a high level of oxalic acid in the blood: 66.1 (normal 2.8–5.5). The recent residual urine volume amounted to 500 mls. On the day before surgery the serum calcium was 2.44 mmol/l, S creatinin was 771° μmol/l, S urea was 29.3 mmol, S potassium 5.21 mmol.

The post-operative course was uneventful and she was discharged in a satisfactory condition.

Discussion

We have described a nasal granuloma containing large deposits of calcium oxalate in a patient suffering from chronic disease of the kidneys supported by artificial means (dialysis) an important factor in the development of secondary or acquired oxalosis.[2]

Oxalosis may be a congenital-primary; or, as in the reported case, an acquired disorder of oxalate metabolism resulting in the deposition of calcium oxalate within the kidneys and other tissues.[2,3] Oxalate calcospherules may also be found in other tissues, notably in the myocardium

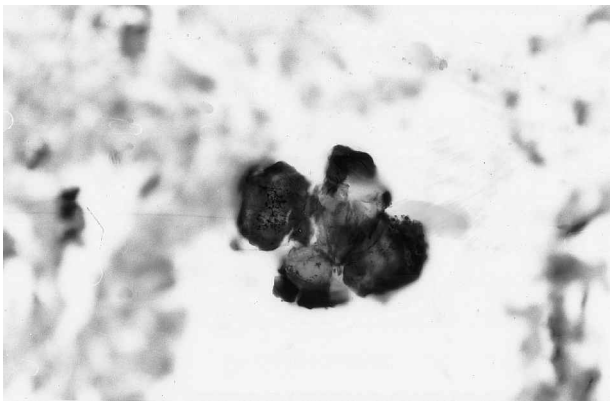

FIG. 5

Psammoma-like crystalloids or calcospherules joined to form bizzare structures lying loosely in the granulation tissue or in some of the cysts (H&E; × 625)

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and small vessels[3] and various granulomatous lesions.[4,5] Benign and malignant neoplasms of the parotid, and other salivary gland neoplasms, may house tyrosine-rich and also oxalate crystalloids[5] and the delicate collagenous crystalloids.[4–8] Oxalate deposits have been described in diverse granulomatous lesions, e.g. tuberculosis; sarcoidosis;[9] and in granulomatous lymphadenitis.[10] The histopathological features of the present case resemble granulomatous lymphadenitis, showing calcium oxalate crystalloids of various shapes in epithelioid histiocytes and multinucleated giant cells.[9] The large lamellar psammoma-like structures, often confluent with others, are like the calcospherules in other calcifying processes evolving from matrix vesicles, as for instance in ossifying fibroma of the nose and paranasal sinuses.[11]

The role of the kidneys is crucial in oxalosis. The excessive amounts of oxalate in the kidneys related to the high levels of plasma oxalate in uraemic patients and to the fact that the kidneys are the only outlet for oxalate.[2] The deposition of oxalate calcospherules may be rapid and dramatic in dialysed patients. It is interesting to note that metastatic intrapulmonary calcification may occur as an unexpected complication, after renal transplantation and dialysis.[12]

Summary

The patient we have described was uraemic and reaching end-stage tubulo-interstitial nephritis treated by dialysis, contributing to the development of oxalosis and of an unusual complication presenting as an obscure tumour of the nose.

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