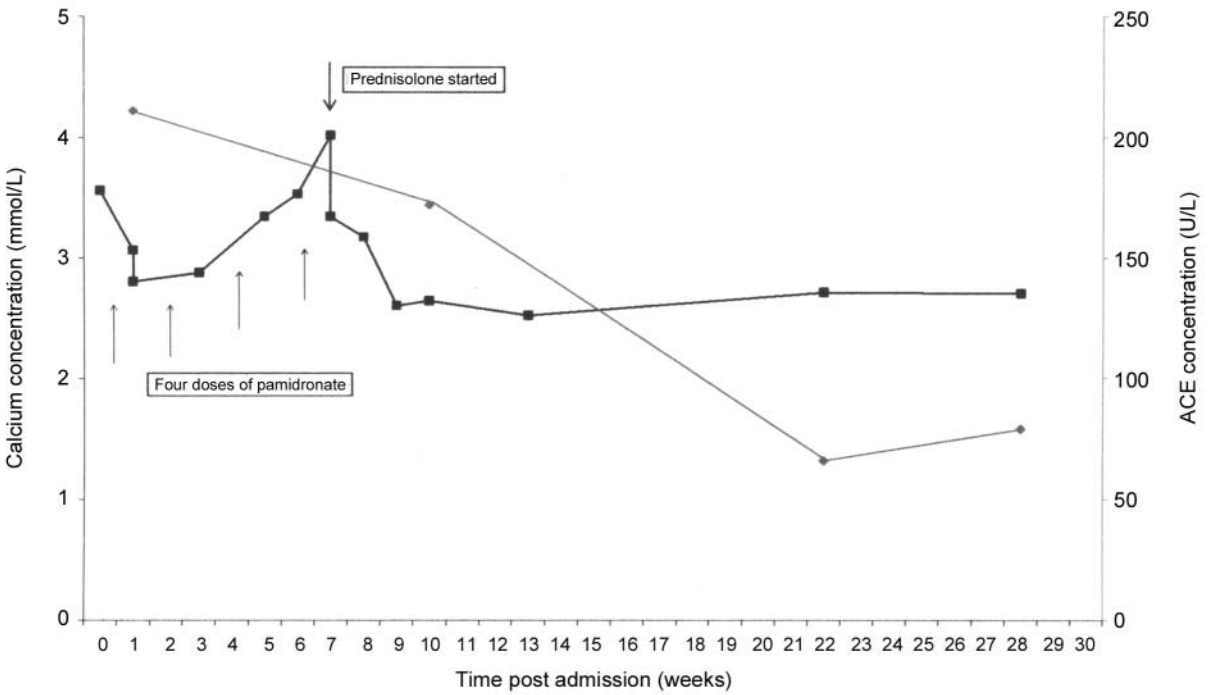

Figure 1 **Serum calcium and angiotensin converting enzyme (ACE) concentration and the effect of prednisolone.** ■ Serum calcium concentration (mmol/L); ◆ serum ACE (IU/L)

reported in alveolar cells obtained from patients with sarcoidosis, with a correlation between expression and disease activity.[4]

If the above theories are correct, hypercalcaemia should not occur in the absence of chest disease. In cases such as ours three possible explanations have been offered. First, the granulomatous tissue responsible for $1,25(OH)_2D_3$ production might be below the limits of standard radiographic resolution.[1] Secondly, the excess $1,25(OH)_2D_3$ might originate from extrapulmonary sarcoid granulomatous tissue. Thirdly, hypercalcaemia might be explained by production of PTHrP. PTHrP acts on $1,25(OH)_2D_3$ in a similar manner to PTH but is regulated by tumour necrosis factor-α and interleukin-6.[3] PTHrP can be found in sarcoid tissue specimens and lymph node homogenates from patients with sarcoidosis[3,4] and high concentrations have been reported in some patients with sarcoid. The PTHrP was normal in our patient. Finally, there is the possibility that increased $1,25(OH)_2D_3$ production may not be the sole cause of hypercalcaemia since $1,25(OH)_2D_3$ is not always raised in these patients.[4]

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A diabetic breast lump

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Organs commonly affected by diabetes mellitus include retina, kidneys and peripheral nerves. Involvement of the breast is unusual.

CASE HISTORY

A man of 47 sought advice because of below-knee numbness and brief loss of consciousness after a fall from a bicycle. Non-insulin-dependent (type 2) diabetes had been diagnosed 4 years earlier and he was being treated with glibenclamide and metformin. He was also hypertensive.

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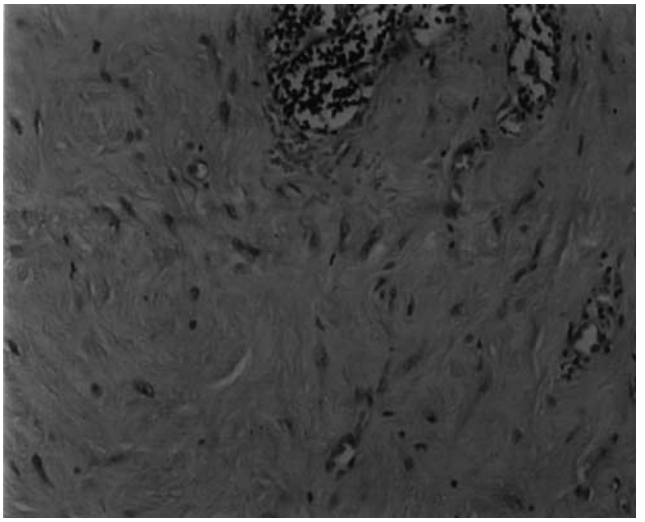

Figure 1 **Epithelioid fibroblasts.** Also seen is lymphocytic vasculitis

Random plasma glucose was 15 mmol/L. On examination there was no neurological deficit but a firm, freely mobile, painless, non-tender, subareolar lump was felt in the left breast. The patient said it had been present for six months. Fine needle aspiration of the mass yielded a haemorrhagic non-representative sample, so a lumpectomy was performed with the provisional diagnosis of gynaecomastia.

The mass measured $4 \times 2.5 \times 2$ cm and was firm and white on the cut surface. Microscopy showed a lesion with extensive keloid-like fibrosis along with many epithelioid fibroblasts. A lymphocytic ductitis was also present, together with a dense perivascular lymphocytic infiltrate (Figure 1). An absence of lobules was consistent with this being a male breast. The lesion fulfilled the criteria of diabetic mastopathy.

COMMENT

In 1984, Soler and Khardori[1] reported a fibrosing mastopathy in patients with longstanding type 1 (insulin-dependent) diabetes mellitus who had other complications of diabetes. Subsequently the term diabetic mastopathy was given to lesions exhibiting a perivascular lymphocytic infiltrate in addition to fibrosis. Tomaszewski *et al*.[2] proposed that the presence of epithelioid fibroblasts in addition to keloidal fibrosis, lobulitis, ductitis and vasculitis was specific for this condition. Most of these lumps have been described in women and have been associated with longstanding type 1 diabetes. There have been rare reports in men and in patients with type 2 diabetes. A similar condition has also recently been reported in the absence of diabetes.[3]

The pathogenesis of this condition is unknown. A proposed autoimmune reaction is consistent with the development of similar lesions in patients with systemic lupus erythematosus and hypothyroidism.[1,4] Tomaszewski *et al*. suggested that the lesion might be the result of hyperglycaemia-induced collagen deposition. The production of advanced glycosylated end products, with resultant neoantigen formation and subsequent B-lymphocyte proliferation and cytokine release, leads to matrix expansion.[2]

The histological appearances are characteristic and pose little difficulty in diagnosis provided one is aware of this uncommon entity. However, epithelioid fibroblasts can be prominent and abundant enough to mimic infiltrating carcinoma cells.[4] There is no documented increase in carcinoma or lymphoma of the breast in these patients.[5] Ely *et al*.[3] have shown a high incidence of bilaterality and of ipsilateral and contralateral recurrences; thus, in a recurrence these patients can be safely followed-up without further surgical biopsy. Fine needle aspiration is not a satisfactory way to monitor these patients because about half the lesions are too fibrous to be aspirated.[6]

Our patient was unusual in that, apart from being a man, his diabetes was type 2 and of short duration, he had no other complications of diabetes, and he was taking oral antidiabetic agents. A history of diabetes or a raised blood glucose should alert clinicians to the possibility of diabetic mastopathy.

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