Lesson of the Week

Severe eczema of the hands due to an orthopaedic plate made of Vitallium

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It is not widely recognised that people who have had allergic contact dermatitis to metal(s) may develop localised or more widespread eczematous reactions after therapeutic or accidental implantation of metallic foreign bodies. We report on a patient who knew that she was allergic to metals and in whom the insertion of an orthopaedic plate made of the alloy Vitallium resulted in severe eczema on her hands.

Case report

A 73 year old woman sustained a Smith's fracture of the right wrist when she tripped over a paving stone. The fracture was reduced and an Ellis plate made of Vitallium inserted to maintain the reduction (fig 1). About 10 weeks later she experienced irritation and oozing from around the scar on the

Implantation of a metal object into a patient with a history of cutaneous metal allergy may provoke a severe eczematous reaction

FIG 1—Smith's fracture of right wrist with Ellis plate in situ.

FIG 2—Severe dermatitis of both hands, which was more extensive on right forearm, affecting skin around operation scar.

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ventral surface of the wrist and subsequently developed a rash, which extended to her right forearm and hand and later to her left hand. She volunteered that she had developed a rash 50 years previously at the sites of contact between her skin and the metal fasteners on her stocking suspenders, from which she had concluded that she was allergic to metals; in consequence she had avoided contact with metals, including jewellery, though she wore her gold wedding ring.

On examination she had a severe eczematous eruption affecting the palmar and dorsal surfaces of both hands and forearms, which was more extensive and pronounced on the right side (fig 2). Patch testing showed strong positive reactions to both nickel sulphate (5%) and cobalt chloride (1%); the Ellis plate applied directly to the skin gave a positive reaction (fig 3), as did fine filings from the plate (obtained with a diamond dental burr).

FIG 3—Positive reaction to patch test to Ellis plate.

Treatment, initially with depot tetracosactrin 2 mg twice weekly for two weeks plus 0.05% clobetasol propionate ointment and subsequently with 0.05% clobetasol propionate ointment alone, suppressed the rash. She had no further treatment after the plate was removed, and the rash did not return. At removal of the plate the fibrous tissue reaction around it seemed to be greater than usual. Histological examination of this fibrous tissue showed collagen, chronic inflammatory cells, siderophages, and a fibrinous exudate. X ray energy spectroscopy of the fibrous tissue showed the presence of only iron; x ray energy spectroscopy of the Ellis plate, the screws, and the filings obtained from the plate showed cobalt and chromium to be present in the alloy, but no nickel was detected.

Discussion

We consider that this patient's eczema was an allergic reaction to the cobalt in Vitallium. Vitallium is an alloy comprising predominantly cobalt (about 60%), chromium (27-30%), and molybdenum (5-7%) but also containing small amounts of silicon, manganese, iron, carbon, and nickel. Though the maximum concentration of nickel permitted in Vitallium is 2.5%, the concentration in the Ellis plate implanted in this patient is considered by the manufacturers (Howmedica Europe) to be only 0.1-0.2%; x ray energy spectroscopy did not detect any nickel in the plate.

The evidence for such "internal contact type allergic dermatitis" is supported by three inter-related observations. Firstly, despite sporadic reports it is not generally appreciated that implantation of metallic foreign bodies may provoke urticarial or dermatitic reactions. Urticaria has been reported after implantation of a Vitallium orthopaedic plate² and a Vitallium orthopaedic nail.³ Localised or generalised eczema has been reported after the insertion of orthopaedic stainless steel screws¹ and plates,⁴ the use of a chrome-cobalt removable denture,⁶ the insertion of a gold ball orbital implant,⁷ and wounding with grenade shrapnel containing nickel⁸; in all these cases the patients reacted positively to patch tests with the appropriate metal(s). Such reactions to orthopaedic implants are rare,⁹ but when they occur they seem to be related to static rather than dynamic implants.⁸ Secondly, metals can be leached out of the alloys used for such implants both in vivo and in vitro,¹⁰⁻¹⁴ so that they are available to provoke allergic reactions. Thirdly, ingestion of nickel (in greater quantities than in a normal diet) may provoke exacerbations of hand eczema in patients sensitive to nickel.^{15 16}

The reported case has two important implications. Firstly, in any patient with troublesome eczema who is allergic to metal and has a metallic implant (orthopaedic or otherwise) the possibility that the implant is the cause of the eczema should be kept in mind and

removal of the implant considered. Secondly, before using therapeutic metallic implants it is a wise precaution to ask patients if they have any history of cutaneous allergy to metal; if they do, patch testing with metals should be performed so that implants made from alloys containing metal allergen(s) can, when feasible, be avoided.

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A 90 year old white woman was admitted with a history of angina and hypertension. Routine SMA-12 showed increased alkaline phosphatase as the sole abnormality. It was 526 and persistently remained more than 500. All the rest of biochemistry including bilirubin, serum aspartate transaminase, serum alanine transaminase, and gamma GT were normal. How specific and sensitive is increased alkaline phosphatase for an underlying cancer in the elderly, and how aggressively should one investigate for an occult malignancy in such circumstances?

Although alkaline phosphatase values tend to rise with age and higher ranges than those for younger adults have been reported in apparently healthy people,¹ values above 500 are clearly abnormal. While less elevated values occur for many reasons in the elderly (including fractures, metastatic bone disease, liver disease, Paget's disease, periostitis beneath chronic leg ulceration, rheumatoid arthritis, and osteomalacia) the absence of other clinical features (anorexia, weight loss, malaise, anaemia, etc) leads one away from a clinical diagnosis of underlying cancer. In the presence of a normal calcium and phosphate such an increased alkaline phosphatase "as the sole abnormality" suggests osteoblastic activity due to Paget's disease. Moreover, the additional clinical information provided supports this diagnosis. When the alkaline phosphatase rises above 300, aged patients with Paget's disease commonly present with cardiovascular problems. In this elderly patient the history of angina and hypertension is more likely to be due to the hyperkinetic circulation found in Paget's disease² than a tachycardia induced by vigorous effort. In such aged patients, however, multipathology is the rule and correctable anaemia (the Hb has not been stated), inappropriate hypotensive therapy, or cardiac dysrhythmia, or a combination of these, occurring at rest may be compounding her cardiovascular problems. Under these circumstances, while aggressive investigation for occult malignancy is not indicated, the quality of this patient's life would be improved if the factors precipitating and aggravating her angina could be identified and corrected in as conservative a manner as possible—including the use of calcitonin to reverse vascularly active Paget's disease.—BRIAN LIVESLEY, consultant physician in geriatric medicine, London.

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