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Rheumatoid arthritis developing after plant thorn synovitis

Sporadic cases of monoarticular synovitis after penetrating injury by plant thorns have been described over the past two decades. In 1966 Kelly¹ reviewed 24 patients with chronic articular or periarticular inflammation secondary to injury by thorns of the blackthorn or sloe (*Prunus spinosa*). In all cases the inflammation was localised at the site of injury.

We describe a patient who presented with seropositive polyarthritis shortly after developing a monoarticular synovitis secondary to a

second metacarpophalangeal joint showed no histological evidence of retained thorn fragments. Culture of synovium and synovial fluid showed no growth. The synovial histology was consistent with rheumatoid arthritis. Subsequently the disease has progressed to definite rheumatoid arthritis (American Rheumatism Association criteria).

To investigate this phenomenon further thorn tips from the rose bush (*Rosa* sp), blackthorn (*Prunus spinosa*), and gooseberry (*Ribes grossularia*) were tested for their capacity to stimulate lymphocyte blastogenesis in a small group of patients. The lymphocytes were labelled with ³H-thymidine and the results expressed as: stimulated counts per minute minus background counts per minute. The findings in our patient (case 1) together with those in a healthy volunteer and a patient with established rheumatoid arthritis (case 2) are shown in the table, as are the results of a later identical experiment on four more subjects: with a monoarticular plant thorn synovitis (cases 3 and 4), a healthy volunteer, and a further patient with rheumatoid arthritis (case 5). Lymphocytes from all of the patients responded normally to the three mitogens, concanavalin A, phytohaemagglutinin, and pokeweed mitogen.

Comment

Only the lymphocytes in our patient (case 1) responded convincingly to the rose-thorn extract, when related to the background counts per minute, which infers that she may have been sensitised by earlier rose-pruning mishaps. There is some evidence from animal experiments that previous immunisation to an antigen may prolong its retention in a joint,²⁻³ while Sugarman *et al*⁴ suggested that plant-thorn synovitis is nearly always associated with the retention of microscopical thorn fragments in the affected joint, although these may be difficult to find even after synovectomy.

Recent hypotheses on the aetiology of rheumatoid arthritis have included the possibility that retention of antigen in a joint may set up chronic inflammation in genetically susceptible individuals, leading ultimately to a self-perpetuating process, perhaps by the exposure of autogenous antigens or even by way of an immune response to components of the inflammatory exudate.⁵ The HLA genotype in our patient (case 1) included the HLA B8 and DR3 antigens, which have been associated with an exaggerated immune response. It is tempting to speculate that an abnormal immune reaction to retained plant-thorn fragments may have played a part in the precipitation of this patient's seropositive polyarthritis.

Results of stimulated lymphocyte blastogenesis in five patients and two healthy volunteers

Subject	Diagnosis	Background cpm	Cpm (stimulated - background)		
			Rose	Blackthorn	Gooseberry
Case 1	Monoarticular plant-thorn synovitis	1004	3225	633	922
Healthy volunteer		1640	-	142	-
Case 2	Rheumatoid arthritis	860	140	-	-
Case 3	Monoarticular plant-thorn synovitis	97	52	130	194
Case 4	Monoarticular plant-thorn synovitis	215	-	-	208
Healthy volunteer		163	225	79	111
Case 5	Rheumatoid arthritis	316	85	-	-

Cpm = counts per minute; - = negative.

penetrating wound by a rose thorn. Some additional results are reported to support this temporal relationship.

Patients, methods, and results

CASE REPORT

A 55-year-old woman (case 1) was pruning a rose when a thorn penetrated the lateral aspect of her second metacarpophalangeal joint. Within 24 hours the joint had become hot, red, and swollen and the inflammation persisted. Just under a month later she developed swelling over all the metacarpophalangeal joints and of the third and fourth proximal interphalangeal joints of both hands, together with pain and tenderness in the right foot. At this point, she presented to us together with part of the offending rose bush. On examination she had active synovitis of the joints as described and tenderness across the right metatarsophalangeal joints.

INVESTIGATIONS

X-ray films of hands, feet, and chest showed no abnormalities; haemoglobin concentration was 13.4 g/dl; white cell count $6.0 \times 10^9/l$, plasma viscosity 1.85 (normal range 1.5-1.72); immunoglobulin concentrations normal; rheumatoid arthritis latex fixation test positive (differential agglutination titre 1/256 later rising to 1/2048); antinuclear factor negative; tissue type HLA A2, B8, B27, DR1, DR3, CW1. A surgical synovectomy of the

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