Twenty-three patients, aged 11-56 years, were uraemic, of whom 21 (91%) received intermittent positive-pressure respiration. Twenty-one of these 23 patients had non-oliguric renal failure, the mean urine output being 1·83 ± SD 0·83 l daily; the two remaining patients were anuric. Blood urea concentration varied from 9 to 60 mmol/l (54 to 360 mg/100 ml) with a mean of 20 ± 13 mmol/l (120 ± 78 mg/100 ml). In the 15 patients in group 2 the mean time to the onset of a raised blood urea concentration was 7·7 ± 1·6 days. The rate of rise of the concentration was 5 ± 3·7 mmol/l/day (30 ± 22·2 mg/100 ml/day). Serum potassium concentration was above 7 mmol (mEq)/l in two patients. The mean serum osmolality was 318 ± 42 mmol (mosmol)/kg and mean urine osmolality 532 ± 143·9 mmol/kg in the patients in group 3. In group 2 the mean serum osmolality was 288 ± 9·1 mmol/kg and the mean urine osmolality 503·1 ± 102·9 mmol/kg.

Blood cultures were positive in four patients. Four patients were given an aminoglycoside antibiotic before the onset of uraemia.

Comment

Renal failure was associated with sympathetic overactivity in 19 of the 23 patients. Sympathetic overactivity in severe tetanus is common in our respiratory unit, a possible explanation for its high incidence being that many patients have not been immunised before the onset of the disease.[4] Hypotension owing to dehydration was not the cause of the renal failure, since adequate hydration was maintained in all patients. Septicaemia and nephrotoxic antibiotics appeared not to be major aetiological factors. Myocarditis was absent in all patients.

Non-oliguric renal failure may be due to early treatment of shock, which may decrease the number of cases of oliguria without always preventing renal failure.[5] The non-oliguric renal failure in most of our patients may possibly have been due to early treatment of the hypotension with sympathomimetic agents. Renal failure associated with tetanus has a high mortality, and 15 of our 23 patients (65%) died.

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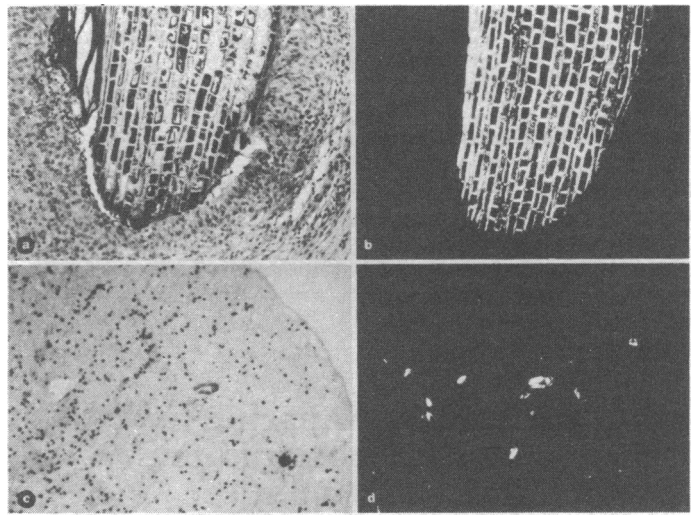
Monoarthritis from blackthorn injury: a novel means of diagnosis

Establishing the correct diagnosis in a patient with persistent monoarthritis is difficult.[1] Reaction to a foreign body will rarely appear to be the cause as this is often hard to prove. We describe two cases of synovitis induced by blackthorn injury and a novel and simple means of diagnosis in a patient presenting with an associated synovial effusion.

Case reports

Case 1—A schoolboy aged 15 fell into a blackthorn bush while riding. One thorn pierced the proximal interphalangeal joint of the right middle finger. The thorn was removed in two pieces. Within an hour the finger had become red, hot, swollen, and painful. During the next week local applications produced slight improvement, although the inflammation fluctuated in intensity. Nine days later the joint again became acutely inflamed and he was treated by his general practitioner with flucloxacillin. Within 24 hours the inflammation had settled but the joint remained swollen; he was therefore referred to this hospital. We suspected that fragments of the thorn remained, and at arthrotomy multiple blackthorn fragments were removed with the aid of a dissecting microscope (figure). His condition subsequently settled completely.



Case 1—(*a*) Blackthorn embedded in synovium with associated foreign-body reaction; (*b*) Same section viewed with polarised light microscopy. Case 2—(*c*) Blackthorn fragments within centrifuged synovial deposit; (*d*) cell wall of vegetable tissue highlighted with polarised light (note multiple small fragments).

Case 2—A diabetic schoolboy aged 12 was admitted to hospital for stabilisation of his diabetes. One week before he had injured his left knee on a blackthorn bush, and within hours the joint had become painful, hot, red, and swollen. Two thorns had pierced the knee and were said to have been removed intact. He was treated with ampicillin and flucloxacillin but improved slowly. His diabetes subsequently became poorly controlled and he was therefore admitted. He was treated with intravenous antibiotics (cephradine) and the knee rested in a plaster back-slab. The swelling settled but did not resolve completely. Synovial fluid aspirate was sterile, though many polymorphs showing toxic granulations were observed in the film. A subsequent synovial aspiration was performed one week later, this time with a white cell count of $4{\cdot}5 \times 10^9$/l. The remaining synovial fluid was centrifuged (3500 rpm for 15 min), the supernatant decanted, and the deposit fixed in 10% neutral formalin. The proteinaceous plug was easily handled by conventional means, obviating the use of gelatin as a support medium. Paraffin block section showed an inflammatory exudate composed of lymphocytes and polymorphs: present within the exudate were small fragments of birefringent vegetable material, suggesting blackthorn fragments within the knee (figure).

Comment

There are many causes of chronic monoarticular arthritis, but despite thorough investigation 30% of cases usually remain undiagnosed. The diagnosis of a foreign-body reaction will either be easy when the penetrating injury is recalled or be most difficult when it is not. Plant thorns, unlike many other foreign bodies, are not detected radiographically. The puncture site is rarely found clinically. The synovial fluid white cell count is raised, most cells being polymorphs, but this is a non-specific and relatively unhelpful finding. Only careful microscopical examination of the synovium will show the foreign body, giant cells, and vegetable tissue; blind or arthroscopic synovial biopsy may therefore be unrewarding. Finding birefringent vegetable material within the spun synovial precipitate may be the easiest way of diagnosing this condition, though the incidence of positive results in patients with known plant-thorn synovitis must be established. Birefringent material may be derived from other sources—for example, crystals of urate, pyrophosphate, or intra-articular steroid preparations—and the vegetative nature of this birefringent material must be established.

The blackthorn is a perennial shrub common in Britain; it has many thorns that can easily penetrate the synovium, stimulating an inflammatory reaction.[2] Interestingly, though the thorn remains

within the synovium or joint cavity, symptoms and signs of joint inflammation fluctuate in intensity, mimicking the intermittent synovitis common in early rheumatoid arthritis.

Histological examination of the synovial fluid precipitate is usually neglected in the investigation of rheumatic disorders. Though it is rarely informative in patients with polyarthritis, it is a pertinent investigation in those with monoarthritis, where failure to recall an initial penetrating injury does not exclude the diagnosis of persistent synovitis induced by foreign material.

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Controlled trial comparing De-Nol tablets with De-Nol liquid in treatment of duodenal ulcer

De-Nol (tri-potassium di-citrato bismuthate) is effective in the treatment of duodenal ulcer,[1] but its usefulness is limited by the unpleasant taste and smell of the liquid formulation. We compared the effectiveness of a new tablet preparation of De-Nol with the established liquid preparation in the treatment of duodenal ulcer.

Patients, methods, and results

Forty patients with duodenal ulceration proved endoscopically were allocated at random to treatment with De-Nol liquid (5 ml four times daily) or De-Nol tablets (1 four times daily) for one month. Patients symptoms were then reassessed and an endoscopic examination conducted by a clinician unaware of their treatment. Bismuth concentrations in blood and urine were measured in all patients before and immediately after treatment and again two weeks after the course of treatment had finished. Patients with renal failure, and those who had undergone surgery for their ulcer or had been treated with cimetidine, De-Nol, or carbenoxolone in the three months before endoscopy were excluded. Patients noted symptoms daily during the course of treatment.

Twenty patients (mean age 43) were treated with De-Nol tablets and twenty (mean age 38) with De-Nol liquid. Groups were comparable in age, severity, and duration of symptoms. In the group taking tablets 16 noted improvement of symptoms, and 15 of the ulcers had healed after one month's treatment. Mean time to the relief of symptoms was 18 days. Seventeen patients found the treatment acceptable or pleasant, and three found it unpleasant. In the group treated with De-Nol liquid 16 noted relief of symptoms, and 17 of the ulcers healed. Mean time to the relief of symptoms was 17 days. There were no significant differences between the groups for these indices. Thirteen of those taking liquid found it pleasant or acceptable, and seven found it unpleasant ($p<0.05$), but none failed to complete the course of treatment. No patient complained of major side effects. Two taking tablets complained of constipation, and one in each group complained of a sore mouth. Two patients taking tablets complained of mouth staining, which was found on questioning to have affected 15 patients taking tablets and six taking liquid ($p<0.05$). Serum bismuth concentrations rose slightly in only two patients and fell after treatment had stopped. The highest concentration recorded was 120 nmol/l (25 μg/l) in one patient. There was no difference between the groups.

Details of patients and results of treatment with De-Nol tablets and liquid

Treatment:	De-Nol tablets	De-Nol liquid
No of patients:	20	20
Male	14	16
Female	6	4
Mean (±SD) age (range) (years)	44·8±16·75 (22-69)	36·2±13·63 (21-60)
Average duration of symptoms (months)	85·4±98·5 (6 mth-26 yr)	56·7±58·9 (2 mth-17 yr)
Severity of symptoms:		
Mild	9	8
Moderate	6	6
Severe	5	6
Symptomatic response:		
Improved	16	16
Not improved	4	4
Mean time to relief of symptoms (days)	18	17
Endoscopic response:		
Healed	15	17
Not healed	5	3

Comment

De-Nol tablets are as effective as the established liquid preparation of De-Nol in the treatment of duodenal ulcer, and the proportion of ulcers healed in each group compares favourably with other agents. De-Nol in both the liquid[2] and tablet[3] forms has been shown to be as effective as cimetidine in the treatment of duodenal ulcer, and a recent report suggests that the relapse rate after De-Nol treatment may be lower (D F Martin, *et al*, British Society of Gastroenterology meeting, 1980).

Side effects in this trial were minor, and appreciable absorption of bismuth did not occur. Bismuth neurotoxicity occurs when serum concentrations exceed 479 nmol/l (100 μg/l),[4] concentrations below 239 nmol/l (50 μg/l) being considered safe, and no patient in our study reached these values. Neurotoxicity has never been reported in a patient taking De-Nol.

De-Nol treats duodenal ulcers effectively and does so without systemic absorption or side effects and without rendering the stomach achlorhydric. The development of an equally effective tablet formulation which more patients find acceptable is an important advance in the medical treatment of duodenal ulcer.

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Successful treatment of D-penicillamine-induced breast gigantism with danazol

D-Penicillamine may cause sudden breast gigantism.[1] Danazol (17 α-pregna-2,4-dien-20-ynol [2, 3-d] isoxazol-17β-ol) has been used to manage benign breast disease.[2] This report describes the endocrine profile, regimen of danazol, and outcome in a patient with breast gigantism induced by D-penicillamine.

Case report

In January 1976 a 41-year-old nulliparous woman who suffered from rheumatoid arthritis began taking D-penicillamine 750 mg daily. In July 1977 she began to complain of breast enlargement. In June 1978 she discontinued the D-penicillamine for three weeks. There was no reduction in the size of her breasts and she had severe swelling of both knees. The D-penicillamine was restarted. In October 1978, after a further slight increase in the size of her breasts, the D-penicillamine was discontinued. Treatment with indomethacin was started and in January 1979 was changed to naproxen 250 mg three times a day. In February 1979, five months after the last exposure to D-penicillamine, the patient was admitted to hospital with