Combined phlebography and arthrography in patients with painful swollen calf

Anticoagulant treatment is potentially hazardous¹ and, since the commonest reason for anticoagulation in hospital is the treatment of deep vein thrombosis, it is of paramount importance that the diagnosis be correctly established. Ruptured Baker's cyst (pseudothrombophlebitis syndrome) is a well-recognised cause of confusion in the diagnosis of deep vein thrombosis. Many workers have emphasised the need for a high index of clinical suspicion combined with either phlebography or arthrography in the differential diagnosis of the two conditions. Results of this study suggest that both phlebography and arthrography are essential for an accurate diagnosis to be reached.

Patients, methods, and results

Five men and five women aged 50-66 (mean 58) years were studied after referral to hospital because of a swollen, painful calf. All 10 patients had a history of painful stiff joints over a period ranging from three weeks to 15 years. Four patients had previously been diagnosed as having rheumatoid arthritis. The duration of the calf pain and swelling ranged from two to 10 days, and all patients were fully mobile on admission. In four patients the left calf was affected and in six the right calf. None had pain or swelling in or above the knee, and only one patient had a palpable popliteal swelling.

Initial diagnosis and presence or absence of deep vein thrombosis on phlebography, arthrography, and estimation of rheumatoid factor

Case No	Clinician's diagnosis	Phlebography	Arthrography	Rheumatoid factor
1	Baker's cyst	—	+ R*	+
2	Deep vein thrombosis	+	+	+
3	Deep vein thrombosis	—	+	+
4	Baker's cyst	+	+ R*	—
5	Deep vein thrombosis	+	+ R*	+
6	Deep vein thrombosis	—	+ R*	+
7	Baker's cyst	+	+	+
8	Deep vein thrombosis	—	+ R*	—
9	Baker's cyst	—	+	+
10	Baker's cyst	+	—	+

*R = Ruptured cyst.

All patients were examined on admission, the clinical diagnosis was noted, and blood was taken for estimation of rheumatoid factor. The patients underwent phlebography² on the first day after admission to exclude the appearance of deep vein thrombosis secondary to bed rest in hospital. Immediately thereafter arthrography was carried out on the affected side. Films were obtained after injection and after active exercise (table). In only one out of 10 patients was the original clinical diagnosis correct. Three patients had both a deep vein thrombosis and a Baker's cyst.

Comment

Katz *et al*³ showed the necessity of maintaining a high index of clinical suspicion for both deep vein thrombosis and Baker's cyst in a group of arthritic patients. They noted certain clinical features that had proved helpful in differentiating these two groups within a large study of 62 patients. Layfer and Jones⁴ suggested that inflammation of the knee joint was a helpful pointer to a ruptured popliteal cyst, but this was not found by MacFarlane and Bacon.⁵ In our series of patients with joint symptoms and swollen calves the clinical symptomatology was singularly unhelpful. The diagnosis was incorrect in nine of the 10 patients. The one patient with a palpable popliteal swelling had both a deep vein thrombosis and a Baker's cyst. We were also unable to differentiate rupture of the cyst from an intact cyst by the signs of inflammation on clinical examination, as suggested by Katz *et al*.³ It is still common to find a patient with a swollen calf being treated according to clinical assessment alone.

It has been suggested that patients with arthritis, perhaps because of salicylate treatment, are protected from deep vein thrombosis. Our results, however, suggest that deep vein thrombosis may occur in such patients.

We emphasise that any patient with a history of joint pain who develops a swollen calf should undergo both phlebography and arthrography. We have shown that deep vein thrombosis and Baker's

cyst may occur concurrently and that the diagnosis of one does not exclude the presence of the other.

¹ Lowe GDO, McKillop JH, Prentice AG. Fatal retroperitoneal haemorrhage complicating anticoagulant therapy. *Postgrad Med* 1979;55:18-21.

² Barrie WW, Wood EH, Crumlish P, Forbes CD, Prentice CRM. Low-dosage Ancrod for prevention of thrombotic complications after surgery for fractured neck of femur. *Br Med J* 1974;iv:130-3.

³ Katz RS, Zizic TM, Arnold WP, Stevens MB. The pseudothrombophlebitis syndrome. *Medicine* 1977;56(2):151-64.

⁴ Layfer LF, Jones JV. Calf pain in rheumatoid arthritis. *IMJ* 1979;155(2):104-5.

⁵ MacFarlane DG, Bacon PA. Popliteal cyst rupture in normal knee joints. *Br Med J* 1980;281:1203-4.

(Accepted 19 December 1980)

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Urinary tract infection due to laboratory-acquired *Escherichia coli*: relation to virulence

Concern about potential hazards of laboratory-acquired infection has increased in recent years. We report what we believe to be the first proved example of a urinary tract infection due to a strain of *Escherichia coli* acquired in the laboratory.

Case report and investigation

A 23-year-old woman who worked in a microbiology research laboratory presented with symptoms of urinary tract infection. Four days earlier she had developed central low abdominal discomfort with dysuria. The urine was smoky brown, and haematuria became more distinct the next day. Frequency and a sensation of incomplete bladder emptying developed on the second day. There was no loin pain, fever, or rigor. Symptoms continued for three days until she took Cystopurine (containing hexamine and sodium acetate), when symptoms subsided. Past medical history was not relevant, and this was her first episode of urinary tract infection. Intercourse had taken place within 24 hours of the onset of symptoms. Cystitis was diagnosed, she was treated with co-trimoxazole two tablets twice daily for seven days, and recovery was uneventful.

Urine contained erythrocytes, more than 10 pus cells/high-power field, numerous bacilli, and yielded a pure growth of *E coli* ($>100 \times 10^8$ /l). The organism was examined in detail and discovered to be identical with a standard laboratory strain, *E coli* SP88, which had been isolated two years before from the urine of a child with urinary tract infection. The strain of *E coli* isolated from the patient was compared with the standard laboratory strain and showed an identical API 20E profile (5044552); when tested by API 50E the profiles were identical at 24 hours, but after 48 hours the laboratory strain fermented starch and dulcitol, while the patient's strain failed to do so. The antibiotic susceptibility of the two strains was identical. Neither strain was typable with *E coli* O and K antisera but both had the flagellar serotype H45. Both strains adhered to human uroepithelial cells, and in neither case was the adherence inhibited by 1% (w/v) mannose. Neither strain agglutinated guinea-pig erythrocytes, but human erythrocytes were agglutinated and haemagglutination was not inhibited by mannose.

These results indicated that both strains carried only mannose-resistant pili (fimbriae) (S N Abraham, S H Parry, M Sussman, in preparation). These were examined serologically and shown to have the identical pilus serotype (ab). Finally the plasmid profile of the two strains was compared by a modification (I M Feavers, M Nahaie, D Owen, C R Harwood, in preparation) of the method of Wilson *et al*¹ with *E coli* PVA 517 as standard. The strains were identical, and each carried seven plasmids (molecular weights 60, 41, 13, 7.6, 3.3, 2.6, and 1.9 megadaltons respectively).

Comment

To establish that the patient's infection was laboratory acquired it was necessary to show that the laboratory strain with which she was working was identical with the strain isolated from her urine.

We believe that this was accomplished: two random strains of *E coli* would probably not show the degree of identity found in our tests. *E coli* adheres to uroepithelium by pili, which are protein filaments on its surface. They are of two types, depending on whether adhesion is inhibited by mannose (mannose-sensitive) or not (mannose-resistant). The *E coli* strains produced only mannose-resistant pili, and such strains are found in only 26% of unselected cases of significant *E coli* bacteriuria (Abraham *et al*, in preparation). Symptomatic urinary tract infection correlates highly with isolation of such strains.²

We assumed that our patient had unwittingly ingested *E coli* SP88, that her intestinal tract had thus become colonised, and that her urinary tract infection had come about by the accepted ascending route.³ We were unable to find *E coli* with the required characteristics in her faecal flora. We cannot exclude that she had transferred the infecting strain to the introitus from her fingers. Nevertheless our observations suggest that *E coli* SP88 is highly virulent for the urinary tract and that mannose-resistant pili may be a long-sought colonisation and virulence factor of *E coli* in the urinary tract.

We thank Peter Yeoman for invaluable technical work and Dr B Rowe, of the Enteric Reference Laboratory, and his staff for help with the serological analysis.

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(Accepted 17 December 1980)

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Crohn's disease in Turner's syndrome

Attention has recently been drawn to the growing number of cases of inflammatory bowel disease reported in patients with Turner's syndrome.¹ We describe two further patients with cytogenetically proved Turner's syndrome, both of whom developed Crohn's disease.

Case reports

Case 1—This girl had presented at the age of 14 years with short stature. She had the typical facial appearance of Turner's syndrome, together with multiple pigmented naevi, an increased carrying angle, and widely spaced nipples. Her karyotype was 46Xi(Xq). One year later she developed bilateral effusions in her knees and pain and swelling of two metacarpophalangeal joints. No autoantibodies were found. The arthritis progressed, affecting the cervical spine, and erosive changes were seen radiologically. Her HLA type was A2A11:B7B27. Alternate-day steroid treatment was required to control her symptoms. At 18 years she developed bilateral uveitis, which was treated with topical steroids and mydriatics. From the age of 15 she had had intermittent diarrhoea, but results of barium-meal and follow-through studies at that time were considered to be normal. Colonoscopy at the age of 18, however, showed mild inflammation throughout the colon. Biopsy specimens from various sites showed histiocytic granulomata with multinucleate giant cells, the appearances being those of Crohn's disease. She is currently being treated with sulphasalazine.

Case 2—A 15-year-old girl presented with painless effusion of the left knee. She was small and prepubertal and, though there were no obvious clinical features of Turner's syndrome, chromosome analysis showed a 45X/46XX karyotype. Over the next six months she lost weight and developed abdominal pain and diarrhoea. Barium studies showed ulceration of the

terminal ileum with a fistula to the sigmoid colon. A clinical diagnosis of Crohn's disease was made. She subsequently developed an abdominal mass and a discharge from the umbilicus. A sinogram confirmed a fistulous connection to the distal ileum and to the bladder. Right hemicolectomy was performed, and histological examination of the resected terminal ileum confirmed the diagnosis of Crohn's disease. Nine days after operation she developed tetanus, and she eventually died despite intensive care.

Comment

Turner's syndrome comprises several well-known external signs with ovarian dysgenesis and failure of secondary sexual development. Certain internal abnormalities such as horseshoe kidney and coarctation of the aorta are also recognised as occurring with increased frequency. An association with autoimmune thyroiditis is well described, and the number of recent case reports of inflammatory bowel disease in Turner's syndrome strongly suggest that this also represents a true association.^{1, 2}

It has been suggested² that inflammatory bowel disease is triggered by an environmental factor in a genetically susceptible individual, and that an abnormality of the X chromosome may influence the genetic predisposition, thus rendering patients with Turner's syndrome more susceptible to the disease. Interestingly there is an unusually high prevalence of karyotypes featuring a structurally abnormal X chromosome, as in our first patient.

Though arthritis occurs in up to 10% of patients with Crohn's disease, its severity usually parallels the activity of the intestinal disease, large joints are usually affected, and radiological changes are rare. Our first patient had the clinical picture of severe juvenile rheumatoid arthritis, which, together with her uveitis, may represent a separate association between autoimmune disease and an X chromosome abnormality.

It is clearly important to regard non-specific symptoms such as malaise, intermittent diarrhoea, and weight loss with suspicion in any patient with Turner's syndrome, as these symptoms call for further investigation of the gastrointestinal tract.

We thank Dr C B Williams for performing the colonoscopy in case 1.

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² Arulantham K, Kramer MS, Gryboski JD. The association of inflammatory bowel disease and X chromosomal abnormality. *Pediatrics* 1980;**66**:63-7.

(Accepted 22 December 1980)

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Acute nephrotic syndrome with reversible renal failure after phenylbutazone

The side effects of phenylbutazone chiefly affect the stomach and bone marrow. Adverse renal effects include sodium retention, acute tubular necrosis, haematuria, and interstitial nephritis.¹ The nephrotic syndrome complicating phenylbutazone treatment is uncommon. We report a patient in whom acute nephrotic syndrome occurred during phenylbutazone treatment.

Case report

An 81-year-old Caucasian man took phenylbutazone 100 mg four times a day for 10 days for a painful right ankle. Three weeks later a 30-day course of the drug in the same dose was started. He stopped taking the drug on the 25th day, when he developed peripheral oedema. He continued throughout with salbutamol and beclomethasone by aerosol, which he had been taking for four years. He had had a brief course of phenylbutazone for backache about one year previously. On admission his blood pressure was 180/80 mm Hg and he had anasarca. The urine contained 35 g of protein daily. The blood urea concentration was 9 mmol/l (54 mg/100 ml) and rapidly rose to 47 mmol/l (282 mg/100 ml). The creatinine clearance fell from 38 to 8 ml/