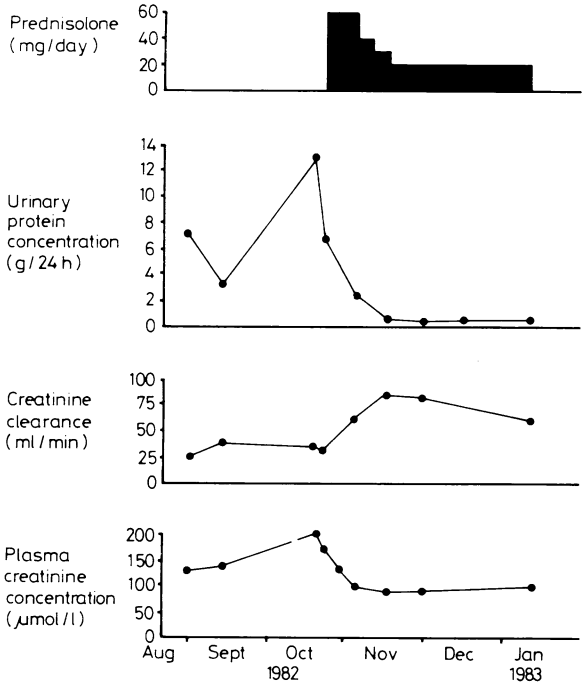
creatinine concentration 140 μmol/l (1·4 mg/100 ml), creatinine clearance 41·4 ml/min, antistreptolysin O titre 60 U/ml (normal < 200 U/ml), serum C3 concentration 1·48 g/l (148 mg/100 ml) (normal range 1·05-1·35 g/l (105-135 mg/100 ml)) and serum C4 concentration 0·5 g/l (50 mg/100 ml) (normal range 0·2-0·5 g/l (20-50 mg/100 ml)). Antinuclear antibodies were present in the serum (titre 1/12). Anti-double-stranded deoxyribonucleic acid (DNA) antibodies were absent. Immune complexes were detected in the serum by the complement consumption technique.

A percutaneous renal biopsy showed a mesangial proliferative glomerulonephritis with no permanent renal damage. On immunofluorescence there was granular deposition of C3 alone on capillary walls and to a lesser extent in the mesangium, while electron microscopy showed small granular deposits subendothelially and widespread loss of pedicle structure.

Her oedema was controlled with treatment with bumetanide and spironolactone by mouth but her renal function deteriorated and proteinuria increased. She was treated with 1 g methylprednisolone sodium succinate intravenously daily for three consecutive days followed by oral prednisolone, which improved her general well being and renal function (figure). At present she is treated with 20 mg oral prednisolone daily and she is free of symptoms and oedema.



Serial measurements of plasma creatinine concentration, creatinine clearance, and 24 hour urinary protein before and after treatment with steroids.

Conversion: SI to traditional units—Plasma creatinine: 1 μmol/l ≈ 0·01 mg/100 ml.

Comment

PUVA treatment consists of the administration of a psoralen compound by mouth followed by irradiation of the skin with long wave ultraviolet light (ultraviolet A 320-400 nm). Impressive results have been obtained in psoriasis and possible success in mycosis fungoides and severe atopic dermatitis.[2] Treatment of polymorphic light eruption with trimethoxypsoralen and natural sunlight has been used for many years in the United States.[1] In countries where natural sunlight is unpredictable a specially designed apparatus is used to deliver ultraviolet light as in PUVA treatment.

Reported side effects during treatment have been few and not serious.[2] In one group of patients with severe psoriasis a high proportion developed antinuclear antibodies during treatment.[3] The titres were low, as in our patient, but were not associated with proteinuria. In another report systemic lupus erythematosus was associated with PUVA treatment of psoriasis.[4] The patient in this case had impaired renal function and proteinuria and a renal biopsy showed a mild focal increase in mesangium, but no immunofluorescence nor electron microscopy findings were reported. She was treated with steroids with a good response.

Psoralen interacts with pyrimidine bases in DNA to form a compound that is immunogenic after treatment with ultraviolet A.[5] An immune basis for the development of nephrotic syndrome in our patient is suggested by the presence of C3 in renal biopsy findings and of immune complexes in the serum and by the good response to steroids. We therefore recommend that the urine should be tested for proteinuria and serum antinuclear antibodies estimated during PUVA treatment.

We thank Drs Frain Bell and A W M Smith for referring the patient to us.

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Early non-radiological recognition of misplacement of central venous catheter

When an infraclavicular approach is used for central venous catheterisation the commonest site for catheter misplacement is the internal jugular vein.[1] This complication, reportedly occurring in as many as 25% of cases, is associated with phlebitis of the internal jugular vein if hyperosmolar solutions are infused.[2] Radiological confirmation of the position of the catheter in the superior vena cava is therefore mandatory albeit time consuming, particularly if the internal jugular vein is accidently cannulated, when the entire catheterisation procedure must be repeated.

For over two years we have used a catheter inserted by an infraclavicular approach into the subclavian vein. The catheter is supplied with a guidewire, which is passed down the lumen of the exploring needle after the subclavian vein has been located. This allows the needle to be removed and the catheter to be threaded over the guidewire, which is itself removed. This manoeuvre dispenses with the need to have the needle anchored to skin for as long as the catheter is in place: this was a clumsy and dangerous feature of earlier catheter design.

We noted on one occasion that on withdrawal the guidewire was curved in a cranial direction (it normally remains straight), and subsequent *x* ray examination showed the catheter to be cephaled directed. We carried out a study to evaluate guidewire distortion as a test for misplacement of the catheter into a neck vein.

Patients, methods, and [illegible]

We studied 25 men and women who required central venous catheterisation for measurement of central venous pressure or delivery of total parenteral nutrition. A 16 gauge Vygon Leader Cath (code 12017) was inserted by an infraclavicular route on the right side in every case. The end of the guidewire was grasped firmly between finger and thumb, withdrawn in a single movement to avoid twisting on its long axis, and carefully laid on a flat sterile surface. Any cephaled or caudal deviation of the guidewire tip was noted and the catheter position then checked radiologically.

In 22 cases the guidewire was deemed to be straight (16 cases) or deviated caudally (six cases). In all these patients *x* ray examination confirmed that the catheter was in the correct position in the superior vena cava. Misplacement of the catheter in the neck was demonstrated radiologically in the three cases in which cranial deviation of the guidewire had been noted.

Comment

Limited *x* ray facilities, distance from the *x* ray department, and availability of a radiographer are common reasons why a radiological check of the position of a catheter might be delayed for an hour or more. Furthermore, the *x* ray film is taken after the catheter has been sutured to skin and the site dressed, so that if repositioning proves necessary this entire procedure must be repeated, with increased risk of local sepsis, further inconvenience to patients and staff, and still more delays before the catheter can be used. Yet this painstaking regimen is followed irrespective of the urgency with which the central line is required.

We have described a rapid, simple, and accurate method of recognising misplacement of the catheter into the neck that permits early repositioning. If misplacement is thought to have occurred by this test we do not now check by *x* ray examination but immediately resite the line using a fresh guidewire. Only when satisfied by the guidewire test that the line is correctly placed do we confirm the position of the catheter and the absence of pneumothorax radiologically, by which time the catheter is in use.

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Sulphasalazine hepatotoxicity after 15 years' successful treatment for ulcerative colitis

Sulphasalazine hepatotoxicity is a well recognised complication, occurring usually within 14 days of drug administration.[1 2] We report the first known case of sulphasalazine induced hepatotoxicity in a patient who had been treated successfully with the drug for 15 years.

Case report

A 37 year old man had first presented at the age of 12 years with bloody diarrhoea. Ulcerative colitis was diagnosed on sigmoidoscopic, radiological, and histological evidence. He was prescribed intermittent courses of sulphasalazine for acute exacerbations with good result and was later taking 1 g four times daily for three years as maintenance treatment. There was no evidence of liver dysfunction until November 1979 when his serum aspartate aminotransferase activity was found to be 49 IU/l (normal range 0-37 IU/l), hepatic alkaline phosphatase activity 380 IU/l (normal range 30-130 IU/l), and serum γ-glutamyltransferase activity 49 IU/l (normal range 0-35 IU/l). His serum bilirubin concentration was normal and there was no jaundice. At this time he was taking sulphasalazine 1·5 g four times daily with no other drug. The liver dysfunction was ascribed to a recent anaesthetic with halothane and returned to normal. In March 1982 while he was taking sulphasalazine 1 g four times daily as maintenance treatment his liver function became abnormal. A sulphur colloid liver scan showed moderate and patchy uptake in a slightly enlarged liver, and liver biopsy indicated no notable abnormality. Values for autoantibodies and hepatitis B antigen were normal. Sulphasalazine treatment was stopped and the liver function tests returned to normal. Exacerbation of his colitis occurred as a result and steroids were given to gain control.

A drug challenge was performed with informed consent. After treatment with sulphasalazine four times daily for 24 hours hepatic alkaline phosphatase activity rose to 238 IU/l, serum aspartate aminotransferase activity to 45 IU/l, and serum γ-glutamyltransferase activity to 296 IU/l, all from normal values. These values gradually returned to normal after the drug had been withdrawn (table).

Serial liver function test results

Date	Serum γ-glutamyl-transferase (IU/l)	Hepatic alkaline phosphatase (IU/l)	Serum aspartate amino-transferase (IU/l)	Serum bilirubin (μmol/l)	Treatment*
11 Sep 1980	42	98	11	9	Sulphasalazine
11 Mar 1982	366	173	43	7	Sulphasalazine
4 Oct 1982	598	340	300	17	Sulphasalazine
18 Oct 1982	352	63	87	10	
25 Oct 1982	179	183	21	9	
2 Nov 1982	46	105	35	6	Prednisone
14 Dec 1982	44	99	31	2	Prednisone
15 Dec 1982	296	238	45	5	Prednisone Sulphasalazine
18 Dec 1982	44	44	19	7	Prednisone

* Sulphasalazine 1 g four times daily; prednisone 10 mg three times daily.
Conversion: SI to traditional units—serum bilirubin: 1 μmol/l ≈ 0·06 mg/100 ml.

Comment

Acute hepatotoxicity with sulphonamide drugs is documented, but tolerance for many years with hepatotoxicity of late onset has not been previously reported. In patients with long standing inflammatory bowel disease receiving maintenance treatment with sulphasalazine it is important to monitor liver function regularly to detect and reverse this adverse reaction promptly.

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DRAWING MEDICINES—The opinion of physicians is, concerning these, as it is concerning other medicines, *viz* Some draw by a manifest quality, some by a hidden, and so (quoth they) they draw to themselves both humours and thorns, or splinters that are gotten into the flesh; however this is certain, they are all of them hot, and of thin parts; hot because the nature of heat is to draw off thin parts that so they may penetrate to the humours that are to be drawn out. Their use is various, *viz* 1. That the bowels may be disburdened of corrupt humours. 2. Outwardly used, by them the offending humour (I should have siad the peccant humour, had I written only to scholars,) is called from the internal parts of the body to the superfices. 3. By them the crisis of a disease is much helped forward. 4. They are exceedingly profitable to draw forth poison out of the body. 5. Parts of the body over colled are cured by these medicines, *viz* by applying them outwardly to the place, not only because they heat, but also because they draw the spirits by which life and heat are cherished, to the part of the body which is destitute of them: you cannot but know that many times parts of the body fall away in flesh, and their strength decays, as in some persons arms or legs, or the like, the usual reason is, because the vital spirit decays in those parts, to which use such plaisters or ointments as are attractive (which is the physical term for drawing medicines) for they do not only cherish the parts by their own proper heat, but draw the vital and natural spirits thither, whereby they are both quickened and nourished. They are known almost by the same tokens that attenuating medicines are, seeing heat; and thinness of parts is in them both, they differ only in respect of quantity, thinness of parts being most proper to attenuating medicines, but attractive medicines are hotter. (Nicholas Culpeper (1616-54) *The Complete Herbal*, 1850.)