returning to work after a holiday in England he was repatriated severely ill. He had had a progressive dry cough, drowsiness, anorexia, weight loss, and recurring fevers. Examination showed drowsiness and confusion, tachypnoea, tachycardia, and fever of 40°C. Apart from mild oral candidiasis examination showed no abnormality and there was no lymphadenopathy or splenomegaly.

He underwent full investigations with negative results apart from a mild leucopenia (white cell count $3.8 \times 10^9/l$ with 93% neutrophils, 7% lymphocytes). Chest radiography showed slight diffuse upper-zone infiltration. Immunoglobulin and immune complex concentrations, T-cell assays, and repeated marrow biopsy specimens were all normal. Appearances at fiberoptic bronchoscopy were normal, but transbronchial biopsy disclosed cysts of *P. carinii*. He was treated with co-trimoxazole without therapeutic response and on the 12th day developed profound pancytopenia necessitating a change to pentamidine. Again there was no response and he gradually deteriorated and died a week later.

At necropsy there was confluent consolidation of the left lung and patchy consolidation in all the lobes of the right. The reticuloendothelial system was normal macroscopically, with no enlargement of glands or the spleen. Microscopy confirmed *P. carinii* to be the infective agent in the lungs, and examination of the spleen and lymph nodes showed a histiocytic medullary reticulosis.

Comment

P. carinii is a protozoan parasite with some fungal features initially classified in 1914.¹ It has a particular affinity for pulmonary alveoli, causing a pneumonic illness. Impaired host resistance appears to be important in the development of pneumonia as all previous cases have been in immunosuppressed patients. The organism occurs widely, and humoral antibodies to pneumocystis may be found in a high proportion of normal children.²

Diagnosis of *P. carinii* infection requires identification of the organism in lung tissue, and transbronchial biopsy via a fiberoptic bronchoscope provides a way of obtaining this without the disadvantages of open-lung biopsy. Treatment with pentamidine isethionate has been successful but has a high incidence of toxic reactions,³ and more recently co-trimoxazole has been advocated as the treatment of choice.⁴

Lack of evidence of immunosuppression should not necessarily exclude the possibility of infection with *P. carinii*, and this case emphasises the need to perform transbronchial biopsy in a pneumonia of unknown aetiology.

¹ Delanoe P, Delanoe M. La rareté de Pneumocystitis carinii chez les cobayes de la région de Paris. *Bull Soc Path Exotol* 1914;7:271-5.

² Pifer LL, Hughes WT, Stagno S, Woods D. Pneumocystis carinii infection. Evidence for high prevalence in normal and immunosuppressed children. *Pediatrics* 1978;61:35-41.

³ Perera DR, Shultz MG. Pentamidine isethionate in the treatment of Pneumocystis carinii pneumonia. *Ann Intern Med* 1976;73:695-702.

⁴ Winston DJ, Lan WK, Gale RP, Young LS. Trimethoprim/sulphamethoxazole for the treatment of Pneumocystis carinii pneumonia. *Ann Intern Med* 1980;92:762-9.

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Richter's hernia: an unrecognised complication of chronic ambulatory peritoneal dialysis

Chronic ambulatory peritoneal dialysis has gained widespread acceptance as a method of treating patients with end-stage renal failure. The technique was initially described by Popovich *et al* in 1976,¹ and the first report of its use in a large series in the United Kingdom was recently published²; increasing use seems certain. Although peritonitis is by far the most common complication, other problems are likely to become evident as experience increases. We use chronic ambulatory peritoneal dialysis in patients with chronic renal failure as part of an integrated dialysis and transplant programme³ and describe here a rare complication of this treatment.

Case report

In 1976 a 26-year-old woman presented with malignant hypertension and chronic renal failure. Her medical history included tuberculous meningitis at the age of 4 years, which had resulted in mild mental retardation, and pulmonary tuberculosis at age 19. Despite reasonable control of the hypertension her renal function continued to deteriorate, and in March 1980 chronic ambulatory peritoneal dialysis was started. A Tenckhoff catheter was inserted under general anaesthesia through a midline abdominal incision and the greater omentum excised to prevent blockage of the catheter. Dialysis was started a week later using the Travenol system and four 2 l exchanges each day.

Her general health improved, haemoglobin concentration returned to normal, and serum biochemistry was well controlled with a mean serum creatinine concentration of 800 $\mu\text{mol/l}$ (9 mg/100 ml). Four episodes of peritonitis were successfully treated with intraperitoneal antibiotics. Eight months after the start of dialysis several brief episodes of upper abdominal pain and vomiting were noted. Symptoms settled rapidly on two successive

Richter's hernia with dilated small bowel proximally and collapsed bowel distally.

admissions to hospital and there was no evidence of peritonitis. On the first admission, however, a tender mass, 2 cm in diameter and under the laparotomy scar, was noted by two observers but resolved spontaneously within a few hours of admission.

In late November she was readmitted with central abdominal pain and copious vomiting. Erect and supine abdominal x-ray films were normal, and peritonitis was diagnosed on the basis of slightly cloudy peritoneal fluid and a peripheral leucocytosis. Intraperitoneal cefuroxime was started and 50 mg pethidine administered intramuscularly to relieve the pain. Shortly thereafter she fainted, inhaled gastric contents, and died despite intensive resuscitation. Postmortem examination showed small-bowel obstruction at the level of the distal jejunum due to a Richter's hernia through a 1 cm defect in the anterior abdominal wall at the upper end of the laparotomy scar (figure). The jejunum at this site showed early necrotic change. The immediate cause of death was severe bilateral aspiration pneumonia.

Comment

As peritonitis is by far the most common cause of abdominal pain in patients receiving chronic ambulatory peritoneal dialysis it is tempting to ascribe any episode of pain without an immediately obvious origin to peritonitis. This case shows the danger of such an approach. We believe that this is the first description of a Richter's hernia as a specific complication of catheter insertion.

¹ Popovich RP, Monceif JW, Dechard JF, Bomar JB, Pyle WK. The definition of a novel portable/wearable equilibrium peritoneal dialysis technique. *Abstracts: American Society for Artificial Internal Organs* 1976;5:64.

² Gokal R, McHugh M, Fryer R, Ward MK, Kerr DNS. Continuous ambulatory peritoneal dialysis: one year's experience in a UK dialysis unit. *Br Med J* 1980;281:474-7.

³ Nicholls AJ, Carto GRD, Edward N, Engset J, Logie JRC, MacLeod M. Integrated dialysis and renal transplantation: small is beautiful. *Br Med J* 1980;280:1516-7.

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