SHORT REPORTS

Stones, Crohn's disease, and Meckel's diverticulum

Multiple faceted radio-opaque stones within the abdomen are usually situated in the gall bladder, and the incidence of gall stones is increased in patients with Crohn's disease.¹ Enteroliths may rarely be found in a Meckel's diverticulum,² and there is an increased incidence of Meckel's diverticulum in Crohn's disease.³ Stones in a Meckel's diverticulum associated with Crohn's disease have not been reported, but we describe such a case.

Case report

A 62-year-old man presented on 19 December 1974 with a two-week history of intermittent central abdominal pain radiating to the right hypochondrium. His only other symptoms were slight constipation and nocturia. He had a tender mobile mass in the right iliac fossa, but, apart from an enlarged prostate, no other abnormality was found. In view of this mass, a barium enema was performed on 23 December. Initial screening disclosed several flat, triangular, laminated stones in the right side of the abdomen, with two further stones in the left iliac fossa. The calibre and haustral pattern of the large bowel were normal throughout. The terminal ileum was abnormal, showing some dilatation with loss of mucosal pattern (see figure).

Postevacuation barium enema film showing stones in the Meckel's diverticulum and Crohn's disease of the terminal ileum.

An erect film showed an air-fluid level at the site of the collection of stones. The films were interpreted as showing gallstones with a fistula between the gall bladder and small bowel, with two stones in the ileum, associated with terminal ileitis, probably due to Crohn's disease. The results of routine haematological investigations were normal, and the patient was admitted for laparotomy and cholecystectomy.

Laparotomy, performed on 10 January 1975 via a right paramedian incision, showed a thickened gall bladder, but no stones were palpable; a large inflamed Meckel's diverticulum, containing multiple stones; and grossly thickened terminal ileum and its mesentery, characteristic of Crohn's disease. A modified right hemicolectomy was performed, removing the Meckel's diverticulum and the terminal ileum, with end-to-end anastomosis. The two stones seen in the left iliac fossa were not found. Apart from urinary infection and retention, he made a good postoperative recovery.

The Meckel's diverticulum contained numerous flat triangular stones. Histologically it contained both gastric and small bowel mucosa, but there was no evidence of Crohn's disease in the diverticulum. The terminal ileum showed chronic inflammatory infiltration with mucosal ulceration, fissuring, and subserosal lymphoid aggregates, typical of Crohn's disease. Analysis of the stones showed a central nidus of undigested muscle fibre; no bilirubin, cholesterol, or stercobilin were detected.

Discussion

Stones in a Meckel's diverticulum are rare: only 33 cases have been reported, and, of these, 14 have been radio-opaque.⁴ Most of the stones have been single or poorly calcified, but when multiple they are flat and triangular with a central translucency.⁵ The presence of an air-fluid level should lead one to suspect a Meckel's diverticulum. The stones are thought to arise from stagnation of intestinal contents in a narrow-necked diverticulum, and in this case they contained a central nidus of undigested muscle fibre, presumably ingested meat.

An association between Meckel's diverticulum and Crohn's disease has been suggested.³ The reported incidence varies from 6% to 18.5%, compared with a normal incidence of Meckel's diverticulum of 2%.

¹ Heaton, K W, and Read, A E, *British Medical Journal*, 1969, **3**, 494.

² Sharma, G, and Benson, C K, *Canadian Journal of Surgery*, 1970, **13**, 54.

³ Ekman, C N, *Gastroenterology*, 1958, **34**, 130.

⁴ Kavlie, H, and Marchioro, T L, *Gastroenterology*, 1972, **62**, 1238.

⁵ Dovey, P, *British Journal of Radiology*, 1971, **44**, 888.

Departments of Radiodiagnosis and Surgery, Southmead Hospital, Bristol

I C HARVEY, MRCP, FRCP, senior registrar (present address: St Mary's Hospital, Newport, Isle of Wight)

H J O WHITE, MCHIR, FRCS, consultant surgeon

Sodium valproate in chorea

In necropsy samples from patients with Huntington's chorea the concentration both of gamma-aminobutyric acid (GABA) and of the related dipeptide homocarnosine have been found to be reduced in the substantia nigra, putamen, globus pallidus, and caudate nucleus. It has also been found that the activity of glutamic acid decarboxylase (GAD), the enzyme concerned in the production of GABA, is appreciably reduced and on the basis of these findings Bird and his colleagues suggested that the use of agents which increase brain GABA concentration might benefit patients with Huntington's chorea.¹ We have therefore studied the effect of sodium valproate (Epilim), a drug which inhibits GABA transaminase, the enzyme responsible for the breakdown of GABA, administered to five patients with choreiform movements.

Patients, methods, and results

The patients included three with hereditary Huntington's disease and two patients without family history whose severe choreiform movements developed late in life. Sodium valproate was administered in dosage maxima of 600-1200 mg/day. The effectiveness of the drug was assessed with particular attention to involuntary movements and gait. In four out of the five cases clinical assessment was supplemented by examination of films taken before and after treatment with the drug. The films were examined

Results of sodium valproate treatment in five patients with choreiform movements

Case No	Sex	Date of birth	Family history	Clinical response	Film assessment
1	F	6 August, 1908	Present	Deteriorated	No improvement
2	F	7 June, 1910	None	No improvement	No improvement
3	F	12 September, 1927	Present	Marginal improvement	No improvement
4	M	4 March, 1902	None	Marginal improvement	No improvement
5	F	31 May, 1911	Present	Marginal improvement	No improvement

blind, the observers not knowing the treatment of the patient at the time of filming.

The results are summarised in the table. The single patient with Huntington's chorea who was not assessed on film deteriorated both in terms of behaviour and involuntary movements so that the treatment had to be discontinued. Of the remaining patients, although three showed some subjective improvement in wellbeing, any changes in observed involuntary movements were at best marginal and in no case did examination of the films show any improvement either in involuntary movements or gait which could be ascribed to the treatment.

Discussion

Attempts to modify brain GABA concentration have not always given consistent results. Thus Barbeau found that neither GABA itself, taken by mouth, nor a combination of isoniazid and vitamin B6, nor the GABA analogue Lioresal (β -p-chlorophenyl- γ -aminobutyric acid) modified the chorea of Huntington's disease.² On the other hand, Fisher *et al* noted an improvement in three out of seven patients treated with GABA in higher dosage.³ Our finding that sodium valproate does not appear to benefit patients with choreiform movements is consistent with that of Shoulson *et al*, who found no improvement when sodium valproate was given either alone or in combination with GABA, although a probenecid-loading test showed there was an increase in the central turnover of both dopamine and 5-hydroxytryptamine.⁴ Patel *et al* comment that the failure of sodium valproate to inhibit amphetamine-induced stereotyped behaviour raises some doubt about the physiological role of GABA in the striatum and in the pathogenesis of chorea.⁵

¹ Bird, E D, *et al*, *Lancet*, 1973, **1**, 1090.

² Barbeau, A, *Lancet*, 1973, **2**, 1499.

³ Fisher, R, Norris, J W, and Gilka, L, *Lancet*, 1974, **1**, 506.

⁴ Shoulson, I, Kartzin, R, and Chase, T N, *Neurology*, 1976, **26**, 61.

⁵ Patel, B C, Crosset, P, and Klawans, H L, *Research Communications in Chemical Pathology and Pharmacology*, 1975, **12**, 635.

University Department of Medicine, Ninewells Hospital, Dundee, DD1 9SY and Dundee Royal Infirmary, DD1 9ND

J A R LENMAN, MB, FRCPD, reader in neurology and consultant neurologist

I T FERGUSON, MB, MRCP, senior house officer in neurology

A M FLEMING, MB, medical assistant, clinical neurophysiology

L HERZBERG, MB, MRCP, senior registrar in neurology

J E ROBB, BMEDSCI, MB, house physician

University Department of Pharmacology, Ninewells Hospital, Dundee, DD1 9SY

M J TURNBULL, BPHARM, PHD, lecturer

Mandril-grown graft for vascular access in Christmas disease

Widespread peripheral venous thrombosis resulting from intravenous infusions of factor IX concentrate in the treatment of Christmas disease necessitated an alternative form of vascular access. A mandril-grown graft was used after a suitable vein was found by perosseous (olecranon) venography of the arm. This vascular access has been the sole route for parenteral treatment for a severely affected patient. We report the indications, technique, and management of the case.

Case report

The patient was a 25-year-old man who had severe Christmas disease with a factor IX level of less than 1%. In 1974 home treatment with self-administered factor IX concentrate was started, venous access being via the antecubital veins. A few months later he developed severe recurrent haematuria that over the next year necessitated several prolonged periods in hospital and daily infusions of large doses of factor IX concentrate (Edinburgh DE FIX) for weeks at a time. As a result of this he developed thrombosis of all accessible veins, including the long saphenous, until eventually access could only be obtained occasionally through the smallest peripheral veins in his hands and feet.

The use of a silicone mandril¹ was proposed if a suitable deep vein could be shown for run-off, but intravenous phlebography of the arm was not possible as no suitable vein was patent. A perosseous olecranon venogram of the left upper arm, under general anaesthetic with factor IX cover, showed a patent left basilic vein (see figure). A Sparks mandril was implanted in a subcutaneous tunnel in the anterior aspect of the left forearm in a loop with the proximal end overlying the brachial artery and the distal end overlying the basilic vein. Three months later with factor IX concentrate replacement the ends of the prosthesis were anastomosed to the brachial artery and the basilic vein. To prevent thrombosis of the prosthesis, heparin 5000 units preoperatively and 5000 units six-hourly was given by constant intravenous infusion for 24 hours by a cut down into the right basilic vein. A small haematoma that developed at the venous anastomosis was treated conservatively.

Perosseous left olecranon venogram showing thrombotic occlusion of antecubital veins but a patent basilic vein.

One month after successful anastomosis the first infusion of factor IX concentrate (1800 units) was given. After six infusions over a two-week period flow through the prosthesis suddenly stopped and at operation clot adherent to the injection site was removed with a Fogarty catheter. Over the next six months about 40 separate infusions of factor IX concentrate were given via a No 21 "Butterfly" (Abbot) needle with the tip of the needle as near as possible to the centre of the stream. The concentrate was infused slowly in an attempt to minimise the possibility of a high local concentration and subsequent thrombosis. On withdrawal of the needle, the pressure applied to the bleeding point was sufficient to maintain haemostasis without obstructing the flow. A second mandril thrombosis has occurred and was again successfully managed. Despite intensive investigations no cause has been found for his recurrent haematuria, and there has been no response to courses of tranexamic acid or steroids.

Comment

Vascular access is often difficult in patients receiving multiple intravenous infusions or injections. Unfortunately, all available concentrates of factor IX contain variable amounts of factors II, VII, and X as contaminants. It was appreciated early that some of these factors might be partially activated, and the risk of intravascular clotting was predicted. Many authors have advised routine testing of such concentrates for procoagulant activity immediately before the infusion is given. With the advent of home treatment pretesting was not practical, and it has become apparent that such concentrates might induce thrombophlebitis in man,² and in animals there is evidence of disseminated intravascular coagulation.³ In our patient, infusions of Edinburgh F IX concentrate resulted in multiple superficial venous thromboses so that venous access became impossible. The fibrinolytic inhibitor, tranexamic acid, may possibly have contributed to the problem by upsetting the equilibrium between coagulation and fibrinolysis.

A valuable adjunct in the preoperative assessment of this patient was the perosseous olecranon venogram. Although perosseous