resection of the diseased segment has been undertaken after such a procedure the diseased bowel is usually found to have healed (Garlock and Crohn, 1945).

On her second admission to hospital, this patient presented all the features of chronic jejuno-ileal insufficiency, a syndrome well described by Bennett and Hardwick (1940), who reported several cases following a variety of conditions such as coeliac disease, sprue, gastro-colic and enterocolic fistulae. They quoted the case of a man who complained of fatigue, loss of weight, diarrhoea, anaemia and symptoms of avitaminosis and hypocalcaemia following an anastomosis for intestinal obstruction. At a subsequent operation he was found to have had a side-to-side anastomosis performed between the upper jejunum and the transverse colon. This case and the case reported are alike in that a surgical error led to short circuiting the major part of the small intestine. In both cases the symptomatology was similar and restoration of the normal continuity of the bowel resulted in a rapid return to normal health.

I am indebted to Mr. R. S. Handley for permission to publish this case.

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A. W. Nurick, F.R.C.S.

Non-Parasitic Cyst of the Spleen*

Cysts of the spleen are rarely met with in countries where hydatid disease is not prevalent, but if their occurrence is borne in mind they should be diagnosed pre-operatively, and are comparatively easily dealt with by splenectomy. Non-parasitic cysts may be as large as a Rugby football, single or multiple, and lined by squamous epithelium, endothelium or fibrous tissue, and they may be calcified. Such cysts occur most commonly in young adult females, and their chief interest centres around their aetiology and classification.

Most writers on the subject are agreed that the first splenic cyst was described by Andral in 1829 (quoted by Moynihan, 1925). This was one of the rarer types of non-parasitic cyst, a dermoid. The subject was first reviewed by Fowler in 1913, and again by the same author in several later papers, the last and most comprehensive being in 1940. Fowler was able to collect 137 cases reported up to the end of 1938, and he classified them and gave figures for the relative incidence of the various types. His main classification was into primary cysts having an epithelial or endothelial lining and secondary cysts having a connective tissue lining. Primary or true cysts account for 21 per cent. of all the non-parasitic cysts, and include dermoids and epidermoids (8 per cent.), haemangiomata, lymphanangiomata and those associated with or resembling polycystic disease of the kidney, liver and spleen (13 per cent. together). Some of these last cases having an endothelial lining, being solitary and unassociated with cysts in other organs, Fowler suggests arise by infolding of the peritoneal covering of the spleen as occurs at the notches on the anterior margin. This may arise congenitally or following inflammation, trauma or repeated hyper trophy and involution.

Secondary or false cysts account for the other 79 per cent. of cases, and have a lining of fibrous tissue only. They may contain clear serous or bloodstained fluid, but in either case many cholesterol crystals are usually present. Most of them are large and solitary (80 per cent.); they are more common in women (60 per cent.) than men, and usually occur between the ages of 10 and 50 years (75 per cent.) (Fowler). They probably have a varied aetiology, including trauma, infarction, inflammation including tuberculosis, and degeneration. All writers are agreed that there is often a history of trauma and this seems especially likely to cause cyst formation in a previously enlarged spleen.

Recently Harmer and Chalmers (1946) have thrown doubt on the clear distinction between true and false cysts of the spleen, by pointing out that a true cyst may lose its epithelial or endothelial lining by pressure atrophy as the cyst increases in size, and further that a false cyst may acquire a lining by metaplasia. They support their contention by reporting a cyst that was lined in part by endothelium and in part by fibrous tissue, and contained

* From the Middlesex Hospital, London, W.1.
bloodstained fluid with cholesterol crystals. This was probably the largest cyst of the spleen so far recorded, weighing 13 lb. and being 24 in. in circumference. This cyst, which was found on routine services medical examination and was correctly diagnosed pre-operatively, extended across the mid-line of the abdomen. They added 26 cases collected from the literature to Fowler's total of 137 cases. There have been several reports since then and Martin, writing in May, 1950, reported the 183rd case, having found 21 more, but did not include Beaumont's case (1950). The present case is, therefore, probably the 185th to be recorded.

Clinically the swelling causes symptoms chiefly by pressure and weight. Dyspepsia, fullness after meals, dragging pain, constipation and a peritonitic type of pain are the commonest features. On examination the spleen is found to be enlarged, but not usually tender. It is commonly so tense as to feel solid and to obliterate the notches.

The differential diagnosis must include hydatid disease, swellings of the kidney and cysts of the liver, pancreas, omentum and ovary, as well as other causes of splenomegaly. The blood count shows no abnormality, which will distinguish a cyst from many other causes of splenomegaly. X-rays will show a large soft tissue shadow in the left hypochondrium displacing the diaphragm upwards, the stomach to the right and the colon and left kidney downwards. Barling and Borrie (1948) show a good example of this, a barium enema and a retrograde pyelogram being performed simultaneously and demonstrating the displacement well. The colon, however, may lie in front of the cyst, and McClure and Altemeier (1942) report a case in a boy of 11 in whom the left kidney was displaced upwards. Some cases show calcification in the wall of the cyst (Elkeles and James, 1943; Bazely, 1948; Donovan, 1948). A Casoni test should be performed on all patients, to exclude hydatid cyst of the spleen, which is twice as common as non-parasitic cyst (Fowler). Aspiration of the cyst is quite unjustifiable.

Treatment is by splenectomy, which is usually not difficult unless the cyst is adherent to the diaphragm, as sometimes occurs. Fowler found a mortality of 4 per cent. of 52 cases treated by splenectomy.

Case Report

The patient was admitted to the Middlesex Hospital under Prof. Alan Kekwick in June 1950. She was a single woman, 27 years of age, who worked as a secretary and lived in London. She had been abroad to Europe and the Middle East, but had not had malaria or any other tropical disease. She complained of a lump in the left upper abdomen which was first noticed two years previously after an attack of jaundice, stitch-like pain in the left subcostal region. The pain lasted only for two or three weeks, but when this disappeared the lump continued to grow in size. She thought there were times when the lump became smaller, but in spite of this it was much larger when she was admitted to hospital than when it was first noticed two years previously. There had been a recurrence of pain under the left costal margin in the last six months. She also complained of a feeling of distension in the upper abdomen and of wanting to bring up wind and being unable to do so. Lately she had had some pain in the left shoulder. She had suffered from constipation for several years and this had been much worse recently. There was also some anorexia, lassitude and headaches, but she had not had any nausea or vomiting. Her weight had been steady and there were no other symptoms.

She had suffered as a child from asthma and had had tuberculous glands in the neck when aged seven, which had resolved without treatment. She had her tonsils removed when aged ten, but thereafter had no serious disease until the present illness.

Her father had died of pulmonary tuberculosis aged 39, but her mother was alive and suffered from rheumatoid arthritis and Menière's syndrome. She had no sisters, but one brother who was mentally defective and had had a pre-sacral neurectomy for Hirschprung's disease at the age of 16 years.

On examination she looked well though rather pale. The temperature, pulse and respiration rate were normal. On examining the abdomen there was a firm, solid mass extending from beneath the left costal margin to the umbilicus. This was slightly tender, moved on respiration and was dull to percussion. It was both visible and palpable.

In the neck there were small, shotty glands in both anterior and posterior triangles, more on the left than the right. There were no other significantly enlarged glands. The blood pressure was 130/75 and there were no physical signs in the chest apart from diminished air entry at the left base. Clinical examination of other systems showed no abnormality.

Blood count at first showed a leucocytosis of 12,000, but the differential count was normal and later samples showed only 7,000 white cells. Urine examination, including microscopy and culture, was negative and no tubercle bacilli were found.

Plain X-rays showed a calcified gland in the left side of the neck, elevation of the left diaphragm and displacement of the gas bubble in the stomach to the right, and of the splenic flexure of the colon.
A left subcostal incision was made under pentothal, gas, oxygen and flaxedil anaesthesia (Dr. B. A. Sellick), and a large cyst was found separating the upper and lower poles of the spleen, which were stretched over the cyst. The vessels in the gastro-splenic ligament were engorged and gave rise to troublesome bleeding. After this had been controlled it was still difficult to mobilize the spleen owing to dense adhesions between it and the diaphragm, but it was eventually delivered without the necessity for aspiration. The abdomen was closed in layers without drainage. One pint of blood was given during the operation.

Post-operatively the patient made a good recovery. Peristalsis did not return until 24 hours after the operation, and there was some difficulty in micturition requiring catheterization for two days. The wound healed well, however, and there were no chest complications. She left hospital early in October 1950, to go to Clacton for convalescence.

She was last seen in December 1950, when she was very well and had gained half a stone in weight. She had none of her previous symptoms except some slight shoulder pain which was improving, and constipation which was better than it had been for the year preceding operation.

The spleen, after removal, was seen to be

downwards. There was a slight dorsilumbar scoliosis, convex to the right. Intravenous pyelogram showed marked displacement downwards of the left kidney with kinking of the ureter, the pelvis of the kidney lying opposite the lower border of L3 (Fig. 1). Barium meal showed displacement of the stomach to the right.

A biopsy of a cervical gland was performed, but histology showed non-specific reactive hyperplasia only. The Casoni test was negative. All other investigations were negative, including examination of the blood for malarial parasites, bone marrow biopsy, plasma proteins, liver function tests and W.R.

It was thought that the diagnosis lay between fibrocongestive splenomegaly due to splenic vein thrombosis, and splenic cyst, and that only laparotomy would settle the answer. The patient was discharged to the out-patient department however, for observation. This was in July 1950.

She was seen only once as an out-patient when the tumour was larger and more painful, and particularly was the pain in the left shoulder worse. Accordingly she was readmitted in September 1950, when laparotomy was decided on, and the patient was transferred to the care of Mr. C. J. B. Murray, who operated on her at the end of September 1950.
almost entirely replaced by a large cyst, there being only a thin rind of splenic tissue at either pole. The spleen and cyst together weighed 6 lb. 12 oz., and its longest diameter was 9 in. On section it was seen to be unilocular with a trabeculated wall resembling a trabeculated bladder as seen through a cystoscope (Fig. 2). It also bears a close similarity to the photograph of the splenic cyst reported by McClure and Altemeier (1942). The cyst contained several pints of turbid, dark brown fluid, the deposit from which showed, on microscopy, numerous 'ghost' red blood corpuscles and an occasional leucocyte, but no cholesterol crystals. Spectroscopic examination showed the presence of met-haemoglobin and bilirubin, but no haemoglobin.

Histology of the cyst showed that it had only a fibrous tissue lining and that the small amount of splenic tissue remaining, although compressed, showed no other abnormality and gave no clue to the etiology of the cyst.

**Discussion**

This case falls into Fowler's category of false cysts and contained haemorrhagic material. Solitary cysts of this type have accounted for over half the total number of non-parasitic cysts recorded to date. The question of etiology remains obscure. There was no history of trauma in this case, although there was some definite sharp pain for two or three weeks immediately before the lump was first noticed. But it is unlikely that the spleen enlarged so rapidly after mild trauma as to be palpable within three weeks. The cyst must presumably have been present before the attack of pain which first drew attention to it. The blood vessels of the spleen are very thin walled and possibly rupture after very slight trauma to give an intrasplenic haematoma. If this occurs near the surface of the spleen the haematoma may rupture into the peritoneal cavity within a few hours or days, but if it occurs deep in the substance of the spleen the haematoma might become walled off and increase in size by osmosis, in the same way that a chronic subdural haematoma increases in size when haemolysis occurs.

There is a definite personal and family history of tuberculosis in this case and the Mantoux was positive to 1:10,000. The dense adhesions of the spleen to the diaphragm and perhaps the referred pain in the left shoulder would also support an inflammatory origin for this cyst, but the remnant of splenic tissue showed no evidence of old inflammation and no fibrosis or calcification.

It is possible that this case arose as a congenital tumour of blood or lymph vessels, and lost its endothelium as the pressure within it rose. Although no lymphatic vessels have been demonstrated in the spleen they are to be found in the deep prolongation, of the serous coat according to Frank (quoted by Fowler). The aetiology of this cyst must remain a matter of guesswork, together with that of all cysts which retain only a connective tissue lining. Perhaps an answer could be found by examining the spleens of those coming to post-mortem unsuspected of splenic disease. All the reported cases have had large splenic cysts and there must be many more which are too small to give rise to symptoms and are unnoticed during life.

**Acknowledgments**

I wish to thank Prof. Alan Kekwick and Mr. C. J. B. Murray, in whose wards the patient was treated, for permission to publish this case.

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