

is followed by the generation of a layer of fibrocartilage in the acetabulum and over the stump of the neck: I have not so far been able to obtain a similar specimen from the hip-joint after acidification; but examination of the cartilage removed from the head of the tibia in a case of osteo-arthritis of the knee, which had received a long and successful course of this treatment, showed a covering of fibrocartilage 1/32 in. thick, covering the whole weight-bearing surface.

Warren Crowe (1944) has reported his results in 400 cases of all kinds, using acid potassium phosphate. I prefer lactic acid, as more closely approximating a natural acid found in the tissues: some difficulty was experienced in obtaining a stable preparation of constant pH, but this has been overcome.

Technique.—Briefly, the technique consists of (1) an injection each week of 15 to 20 c.cm. of a solution of lactic acid of a pH of 5.8, together with procaine, into and around the joint; (2) followed by very gradual manipulation, and flexion-abduction-extension exercises, without weight-bearing, consistently and perseveringly carried out by the patient.

Analysis of Cases

The cases described are of the hospital out-patient class, referred to me either by the physiotherapy department or directly by their own doctor. In all, 142 cases have been examined and 108 treated in this way during the last five years. Owing to removals, bombing, and other causes, I have not been able to attempt a complete follow-up of these cases: I have, however, investigated the result obtained in 26 consecutive cases which were referred to me in the year 1942; and I find that between 50 and 60% of these patients obtain enough relief from pain and recovery of function to be able to carry on their normal occupations, including housework and shop assistant's work in women, and shipyard work—riveting—and even in two instances coal-hewing, in men.

In this condition it is extremely difficult to establish any scientific criterion of success or failure of treatment. Pain, the patient's chief disability, is a subjective matter; with the possible exception of the demonstration of the narrowed joint space, radiography is an indifferent guide to the clinical condition; nor does limitation of range of movement bear any constant mensurable relation to the clinical condition. For a number of years I have made my own percentage assessment of the degree of overall disability. For example, when a patient is for all practical purposes confined to bed he is assessed at from 90 to 100% disabled; others able to get about, but with considerable difficulty, at 70 to 80%. These assessments are entered on the patient's case-sheet at the beginning of treatment, while on completion a final assessment of the degree of disability remaining is made. While this is a purely clinical method of estimation and dependent on the surgeon's personal observation, I find it the most useful means of ascertaining whether the patient has improved under treatment.

Discussion

The chief contraindication to suitability for this form of treatment is extreme loss of joint space, particularly in the outer and upper quadrants of the joint, as seen by radiographs. The amount of osteophytic outgrowth does not in itself, however, govern the suitability of the case for acidification. Extreme loss of joint space indicates extensive destruction of the articular cartilage, and, apart from the unlikelihood of obtaining effective regeneration of joint surface by fibrocartilage, the mechanical difficulty of reaching the space of the joint with the needle is almost insuperable. Five of the 26 cases come into this category, of which two were successfully dealt with by oblique osteotomy; no treatment was given to the remaining three. Three cases failed to continue treatment after the first or second injection, and must be written off. Of the remaining 18 cases, all of which I have examined within the last few months, four were in-patients and carried out what I regard as the complete course. These are naturally the most successful. Three appear to be almost completely free from symptoms: one, a housewife who had been confined to bed or a chair for a year previous to treatment, is now fully active, does all her housework, and can stand in queues and do her shopping. By her own account she is practically free from pain or any disability. There is still some limitation of range of movement, particularly inward rotation. Her original classifica-

tion was in the 90 to 100% class; I estimate her total disability now as under 10%. The two remaining male cases were those of a coal-miner and a slinger at an ironworks; both are free from pain, but have rather greater limitation of range of movement; they have returned to full work at their heavy occupations. The fourth case is a failure; for a year after finishing treatment this patient continued fairly well, but his condition has since deteriorated. The remaining 14 patients—nine men and five women—were treated purely as out-patients. The average disability figure at the first examination I put down as in the region of 60%; only three (men) are relative failures, in that after completion of treatment the disability figure is still in the region of 40%. The other 11 are all sufficiently recovered to carry on a useful existence, and, in several cases, hard physical work, without complaint of pain; their average remaining disability figure I put at well under 20%. Two of them have returned in recent months, as they felt they were getting more pain. They have been given a further course of six injections; this appears to have cleared up any return of symptoms.

Results in 18 Cases of Mono-articular Osteo-arthritis of the Hip treated by Joint Acidification

	No.	Results		
		Very Good	Good	Poor
In-patients	4	3	0	1
Out-patients	14	4	7	3

It is not easy to obtain a solution which remains constant; I use that made for me by Brady and Martin, Newcastle-upon-Tyne, which is reliable.

Summary

The method of treatment of osteo-arthritis by intra-articular acid injection is outlined.

Non-operative methods of treatment of mono-articular osteo-arthritis of the hip are itemized.

The results of acid injection in 18 cases are analysed.

REFERENCES

- Crowe, H. Warren (1944). *Lancet*, 1, 563.
 MacMurray, T. P. (1943). *A Practice of Orthopaedic Surgery*, p. 155, London.
 Waugh, W. G. (1936). *Lancet*, 2, 976.
 — (1938). *Ibid.*, 1, 487.
 — (1939). *Rheumatism*, London.

TORSION OF A PEDUNCULATED GASTRIC CYST

BY
M. D. SHEPPARD, F.R.C.S.

AND
J. R. GILMOUR, M.R.C.P.

(From Chelmsford and Essex Hospital, Chelmsford)

Cysts of the stomach are rare and few cause symptoms. We describe in detail one case of clinical importance and mention three others in a short discussion upon gastric cysts.

Case Report

Clinical History and Examination.—A woman, aged 62 had felt rather full in the abdomen for two years and had noticed a swelling in the right iliac fossa for about four months. She had been troubled with constipation and hiccups also. On palpation of the abdomen a freely movable globular tumour about the size of a grapefruit was found. It was not tender and could be pushed right up under the costal margin. A long-pediced ovarian cyst was diagnosed and its removal advised.

On laparotomy the tumour proved to be a cyst in the peritoneal cavity with a long pedicle attached to the greater curvature of the stomach. The pedicle was twisted about five times, and the cyst, although not necrotic-looking, was discoloured in places. There were patches of fibrinous exudate and a portion of lightly adherent omentum upon its surface. Muscle fibres of the muscularis of the stomach were observed running from the greater curvature right down the pedicle to the cyst wall. The cyst was removed without difficulty and the patient made an uninterrupted recovery. Subsequent questioning yielded no information indicating when the torsion had occurred.

Pathological Examination.—The specimen consisted of a cyst, 11 by 10 by 7.5 cm., the outer surface of which was greyish blue,

smooth, and marked prominently by veins, and a flat layer of adipose omentum was attached over an area 18 by 14 cm. The wall consisted of greyish-white or brown tissue from 1 to 5 mm. thick. The content was a sepia-coloured fluid and clotted blood in about equal amounts. Most of the clot was deposited upon the inner surface of the cyst, and it contained several fragments of grey tissue up to 1 by 0.5 cm. The wall was composed of connective tissue, which in most places was loose and oedematous and in others fibrotic. In a few places in the wall there were bundles of smooth-muscle fibres, but epithelium was everywhere absent. There were foci of lymphocytes, plasma cells, and eosinophil leucocytes, and many patches of recent haemorrhage; evidence of old haemorrhage in places was shown by intracellular or extracellular granular haemosiderin and haematoidin and by impregnation of collagen fibres with ferric and ferrous salts which stained deeply with Ehrlich's haematoxylin. Numerous spindle-shaped areas of proliferated cells and relatively little collagen lay in the wall. The majority of the cells were spindle-shaped, but others appeared to be spheroidal, and in most the cytoplasm was vacuolated or diffusely dropsical. Some of the cells in a few spindles could be identified almost certainly as muscle cells, but the remainder were undifferentiated. In parts of the wall containing bundles of muscle fibres the spindle-shaped thickenings lay in close association with the bundles. No axis cylinders could be seen in the spindles in Bielschowsky preparations. The spindles appeared to result from regeneration of muscle by proliferation of undifferentiated connective-tissue cells, the differentiation into muscle cells being abortive. The haemorrhage in the wall of the cyst was continuous with the deposit of clot upon the inner surface, and the fragments of grey tissue in the clot were spindle areas of cellular proliferation which had become separated off from the wall as the result of haemorrhage.

Discussion

Many gastric cysts in cases reported in the literature were symptomless and were discovered at necropsy. Others gave rise to symptoms which appeared in infancy or at some later age, even in late adult life. Symptoms were variable, but abdominal pain, vomiting, loss of weight, and swelling of the abdomen were the most common. In no reported case was torsion described, but in Tchernisher's case (according to Gray and Wood, 1938) the cyst was attached to the stomach by a long stalk as in our case. Haemorrhage had occurred in the wall of the cyst in the cases of Weichert (1929) and Ladd and Gross (1940), but its cause was not mentioned.

The size and number of cysts occurring in any reported case varied. Three cysts were present in the Cabot case 14242 (1928) and Pancotto's case (1927); and in that of Askanazy (1923) there were numerous cysts. Askanazy described very minute cysts, and Tchernisher (according to Gray and Wood) one the size of an adult head.

According to structure there are four types of gastric cyst. The most common type is the *enterogenous cyst*, which lies in the muscularis mucosae, submucosa, or muscularis in any part of the stomach, but particularly in the pyloric region and commonly at the greater curvature. They probably arise from epithelium separated off from the gastric mucosa during development, but growth of this epithelium into cysts may occur at any time of life. Bikoff (1938) ascribed the origin of a cyst—the size of a hen's egg—which had been removed from the greater curvature to the duct of ectopic pancreatic tissue. It was more likely to be enterogenous, since it was lined with a layer of columnar epithelial cells and a few gland-like structures lay in a subjacent layer of connective tissue. Enterogenous cysts are lined with a single layer of epithelial cells, columnar in most, and they lie upon a layer of connective tissue which in some instances contains a variable number of tubular glands. The formation of well-developed typical gastric mucosa is probably uncommon. A muscularis mucosae is usually present. In the cysts of Wendel (1911), Ferraro (1942), Askanazy, and Pancotto the mucosa was of gastric type, while in the Cabot case the lining mucosa was described as being atrophic gastro-intestinal.

Enterogenous cysts lined with gastric mucosa are not limited to the stomach. Seydl (1938), for example, described such a cyst in the lower posterior mediastinum, and peptic ulceration of the cyst had caused perforation into a bronchus and fatal haemorrhage from an eroded artery.

The following is a description of two enterogenous gastric cysts which, although very small, probably represent the rests from which large cysts of clinical significance arise.

In a female infant of 1 hour, which had absence of the left dome of the diaphragm, diaphragmatic hernia, hypoplasia of the left lung, and coarctation of the aorta, a cyst, 3 mm. in diameter, projected into the greater omentum from the greater curvature at the junction of its middle and upper thirds. It lay in the muscularis and had a muscularis mucosae and a mucosa in which straight tubular glands were very few but like those in the stomach. In the other example a cyst, 3 by 1 mm., was found in the microscopical section of the pyloric region of a part of the stomach removed from a man of 61 because of chronic peptic ulceration. The cyst lay in the muscularis mucosae and was lined with a layer of cubical or short columnar mucous cells.

The second type is a *dermoid cyst*, in which there are two examples only. These cases were inadequately described by Gray and Wood (1938), and no histological data were given.

The third type is that *due to septa*, of which there is only one example. In this case (Metz, Householder, and De Pree, 1942) the cyst was the middle of three compartments of the stomach formed by two complete septa. Gastric mucosa lay on each surface of the septa.

The fourth type is that in which the lining is destroyed, so that the *origin is unknown*. Ladd and Gross described a cyst of this type lined with haemorrhagic necrotic tissue. Our cyst, which had undergone torsion, was of similar type, and the following is a description of another example.

A man aged 68 had had attacks of "the gastric," consisting of belching chiefly, for two years, and abdominal pain, loss of weight, and frequent vomiting for nine days before admission to hospital. A mass was palpable in the right upper quadrant of the abdomen. Death occurred from bronchopneumonia 10 days after admission. The lower two-thirds of the oesophagus had a rough, opaque, bile-stained lining, and microscopically the inner part of the wall was necrosed and undergoing peptic digestion, but the muscularis mucosae was hypertrophied and ghosts of cells probably indicated that inflammation had been present. Mild oesophagitis and cardiospasm probably accounted for the gastric symptoms. A cyst, 8 by 6 cm., lay in the pylorus and had a thin wall of fibrotic connective tissue in which there were few cells in most places and slight lymphocytic infiltration in others. The inner surface was necrosed and undergoing digestion in places. The anterior part lay in the submucosa, but posteriorly the cyst passed through the muscularis into adipose connective tissue to reach the anterior surface of the normal pancreas. The adipose tissue adjacent to the cyst wall showed areas of fat necrosis, which was of pancreatic type in that lipolysis and saponification had occurred. It was evident that the cyst contained ferments which had destroyed the lining epithelium and had caused the fat necrosis. The fact that the latter was of pancreatic type is insufficient evidence for one to ascribe the cyst to ectopic pancreatic tissue in the pylorus.

It is probable that cysts of this type, with absent epithelium, are enterogenous, and that the lining has been destroyed by ferments or circulatory disturbance.

Summary

A case of torsion of a pedunculated intraperitoneal cyst of the stomach, in a woman of 62, is described. The cyst was probably enterogenous, and an epithelial lining had probably been destroyed in consequence of torsion.

REFERENCES

- Askanazy, M. (1923). *Deut. med. Wschr.*, **49**, 3, 49.
 Bikoff, H. S. (1938). *Amer. J. Dis. Child.*, **56**, 594.
 Cabot case 14242 (1928). *New Engl. J. Med.*, **199**, 236.
 Ferraro, F. P. (1942). *Amer. J. Surg.*, **57**, 525.
 Gray, H. K., and Wood, G. A. (1938). *Surg. Clin. N. Amer.*, **18**, 1069.
 Ladd, W. E., and Gross, R. E. (1940). *Surg. Gynec. Obstet.*, **70**, 295.
 Metz, A. R., Householder, R., and De Pree, J. F. (1942). *Surgery*, **11**, 586.
 Pancotto, E. (1927). *Pathologica*, **19**, 521.
 Seydl, G. N. (1938). *Frankf. Z. Path.*, **52**, 346.
 Weichert, M. (1929). *Beitr. klin. Chir.*, **145**, 599.
 Wendel, W. (1911). *Arch. klin. Chir.*, **95**, 895.

The following statement on bread policy has been authorized by the Executive Council of the Food Education Society (29, Gordon Square, W.C.1): (1) The Food Education Society regrets that the Government has reduced the extraction rate of the wheat grain for bread flour to 80% on inadequate scientific and clinical data, especially at a time when the position in regard to food supply in general is so uncertain. (2) There is good reason to think that any reduction below 80% would be detrimental to the health of the people and should not be put into effect without further inquiry and experience. (3) The Society is strongly of the opinion that a specification for the post-war loaf is highly desirable, as in the case of other basic foods.