Fashions in Duodenal Ulcer Surgery

Surgeons who are long enough in the tooth, or else well acquainted with surgical publications over the last 50 years, will know that abdominal surgeons are apt to claim that *today's* operation for duodenal ulcer is, as a famous contemporary boxer would say, "the greatest." It has negligible mortality and minimal side effects, and recurrences are almost unknown. As each new claim comes on the market the old hand gives a cynical smile—and waits.

Gastroenterostomy was first employed in the surgical management of duodenal ulcer at the beginning of this century,[1] [2] reached the height of its popularity about 1925, and has had flickers of revival ever since. However, a stomal ulceration rate in the region of 25% and the risks of such complications as gastrojejunocolic fistula[3] have probably banished this procedure for ever into surgical history.

Partial gastrectomy, first applied to gastric cancer and then to gastric ulcer, began to be used with increasing frequency in the treatment of duodenal ulceration in the 1930s and reached its zenith of popularity after the second world war.[4] In those days it was a large undertaking, in all its variations, with a disturbing mortality and with many early and late complications. Surgeons sought to overcome the problem of the apparent illogicality of treating a small ulcer in one organ by removing 7/8ths of its neighbour. Vasoligation of the four main vessels of the stomach to reduce secretion of acid had a short but disastrous career. Few young consultants will remember the vogue for radiotherapy to the stomach,[5] nor will our senior registrars be able to recall the heady days of gastric freezing for duodenal ulcer.[6] Stilboestrol was found to cure our young men of their duodenal ulcers,[7] but they begged us to give them back their potency, even though this meant that their ulcer symptoms would also return.

Undoubtedly vagotomy represented the most physiological operation in the treatment of duodenal ulcer. The great majority of cases are associated with an increase in the nervous or vagal phase of gastric secretion, and an attack on this is both attractive and logical. In 1943 L. R. Dragstedt and S. M. Owens[8] reported on two patients with duodenal ulcer whom they had treated with vagotomy. Within two years, after operating on 15 patients, three had required gastrojejunostomy for gastric stasis; it was soon apparent that total division of the abdominal vagus must be accompanied by some form of gastric drainage. Antrectomy, pyloroplasty, and gastrojejunostomy each has its own advocates. A still more attractive physiological concept was to denervate the stomach alone, without depriving the rest of the gut and its adnexae of their innervation, and surgeons have been using various types of selective vagotomy since R. G. Jackson[9] introduced this procedure in 1948. Finally, owing to the experimental studies of C. A. Griffith and H. N. Harkins,[10] we have the latest concept, that of selective proximal vagotomy. In this operation only the parietal-cell area of the stomach (which is responsible for acid secretion) is denervated, the antrum being left intact with the hope of obviating the need for gastric drainage.

How is the surgeon to decide on what to do for his patients? He must rely on comparing the mortality rates and the results of treatment obtained in controlled trials of the various procedures, but he must also take into account two other important factors which are less easy to measure—the skill of the surgeon and the selection of patients for surgery.

The reasons for the present popularity of vagotomy and drainage are, firstly, its simplicity when it is compared with the more radical procedure of partial gastrectomy and, secondly, its appeal as being a more "physiological" approach to the problem. Now in a surprising and important report J. C. Goligher and his colleagues[11] have compared total vagotomy and pyloroplasty with vagotomy and gastroenterostomy, vagotomy and antrectomy, and subtotal gastrectomy. All the operations were carried out by a group of skilled surgeons in Leeds and York. Recurrent ulceration was found to be more common after vagotomy and pyloroplasty than after all the other procedures, and this operation gave the poorest functional results as assessed by the Visick grading. Under both headings best results were obtained in this study by either vagotomy and antrectomy or by subtotal gastrectomy. These authors conclude that truncal vagotomy and pyloroplasty has not lived up to expectations and that its present place as the most popular procedure in the elective surgical treatment of duodenal ulceration should be reviewed.

Those conservative surgeons who have plodded on performing partial gastrectomies for their patients over the years will be delighted to read of the excellent results which this procedure can give in expert hands. K. C. McKeown,[12] of Darlington, has recently reported a personal series of 800 cases followed up for 10 to 20 years. In 778 elective operations the mortality in hospital was only 0.7%, though in 22 emergencies for drenching haemorrhage this rose to 22.7%.

No less than 79% of cases were graded as Visick I and 15% as Visick II, the first group being without symptoms at all and the second with negligible functional disturbance. Stomal ulceration occurred in 16 patients; all were operated upon again, and 13 were converted to a satisfactory status. No established case of postgastrectomy bone disease occurred in the whole series. Such magnificent results cannot be expected to be achieved by the average or trainee surgeon. For example R. W. Postlethwait and W. D. Johnson[13] found that the mortality for elective surgery of all types for duodenal ulcer in Veterans Administration Hospitals in the U.S.A. carries with it a 2·8% mortality.

Most surgeons find that their best results follow surgery on patients with severe local disease and that the outcome is less happy when, in a traditional phrase, there is "a small ulcer in the duodenum and a large ulcer in the mind." When patients have already reached the stage of gross pyloric stenosis and therefore have undoubted gross organic disease, the results of surgery are functionally excellent.[14] I. McColl and his colleagues[15] have shown that psychological testing preoperatively can give a reasonably accurate forecast of those patients who are likely to achieve a poor result from their gastric surgery.

The lessons of surgical history when applied to duodenal ulceration are simple. Today's miracle may be tomorrow's disaster, and what is archaic this year may again be the fashion in 12 months' time. Premature conclusions on too few patients are often fallacious, and every study based on a follow-up of less than a bare minimum of five years must be regarded as tentative and preliminary indeed.

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[3] Lowdon, A. G. R., British Journal of Surgery, 1953, 41, 113.
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[5] Brown, G., British Journal of Surgery, 1954, 41, 359.
[6] Wangensteen, O. H., Annals of the Royal College of Surgeons, 1962, 31, 143.
[7] Truelove, S. C., British Medical Journal, 1960, 2, 559.
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[11] Goligher, J. C., et al., British Medical Journal, 1972, 1, 7.
[12] McKeown, K. C., British Journal of Surgery, 1972, 59, 849.
[13] Postlethwait, R. W., and Johnson, W. D., Archives of Surgery, 1972, 105, 438.
[14] Ellis, H., Pyloric Stenosis due to Duodenal Ulceration, in Chronic Duodenal Ulcer, ed. C. Wastell. London, Butterworths, 1972.
[15] McColl, I., Drinkwater, J. E., Hulme-Moir, I., and Donnan, S. P. B., Gut, 1971, 12, 856.

Reattachment of Severed Limbs

Modern techniques in vascular surgery have a clear role in management of major limb wounds. R. S. Shaw[1] in 1959 pointed out how reconstructive arterial surgery can both reduce the risk of amputation and improve the quality of recovery when major vessels have been divided. It was only a short step technically to apply these methods to traumatic amputations and seek to restore the circulation to a completely separated part of the limb. Opportunities for attempting this surgical tour-de-force are rare, but a recent report by R. A. Malt and his colleagues[2] from Boston will encourage surgeons who are faced with such a problem. These writers were successful in five out of seven attempts at re-attachment of the severed limb. In two the amputation had been through the upper arm, in one through the forearm, and in two at the wrist. The two earliest patients, including the first successful case ever reported, ten and five years later were both doing hard manual work with important and useful function in the reattached limbs. The more recent cases were making comparable progress. About 50 such successes have now been reported, including several from China,[3] and the procedure must be regarded as of established value when the indications are correct.

At Boston only about one in five traumatic amputations of the upper limb was selected for replantation. Contraindications included severe mangling of the amputated limb, avulsion injuries that had torn the major nerves at a level too proximal for useful repair, severe crushing of the tissues at the level of amputation, and extensive injuries elsewhere. One of the Boston cases failed because of pre-existing arterial disease in the severed hand. Distal damage to the amputated part need not prevent replantation, since after successful restoration of the circulation more peripheral injuries may be treated along traditional lines. In the successful cases the period of ischaemia was between four and eight hours, though longer survival has been reported. The outlook is better in patients under the age of 30. Reattachment is particularly desirable if the opposite limb is defective or missing. The patient's likely success with an amputation and prosthesis must also be considered. Reattachment of a lower limb is on these grounds rarely indicated.

It is important to realize that the replantation will usually be only the first of a possibly long series of operations on bones, tendons, and nerves, a severe test of the patient's motivation and endurance. Immediate failure from thrombosis of the repaired vessels can be followed by prompt amputation, and the patient will have lost little in the attempt to save the limb. More serious failure occurs when the limb survives but for a variety of reasons useful function is not restored, and secondary amputation proves not acceptable. The message from Boston is that such a sequel is exceptional. The prognosis for function improves the more distal the wound, until a point is reached where the blood vessels to be repaired are so small that suture becomes technically unsatisfactory. Microsurgical techniques are necessary below the wrist. H. E. Kleinert and his colleagues[4] reported three cases of digital vessel repair with apparent early success but late failure in all from small-vein thrombosis during the following two days.

When reattachment of a severed limb is to be attempted the vascular tree of the amputated part should be perfused with saline and the tissues cooled on crushed ice. Thorough débridement of the injured surfaces is essential. Preoperative angiography is not advised. The principles and methods of tissue repair differ in no way from those applicable to less dramatic wounds. The bones have to be freely shortened to allow approximation of the soft tissues without tension. Arthrodesis of the wrist, when applicable, can offer extra advantage in improved venous drainage of the hand. The bones are stabilized by internal fixation, and attention is then turned to the arterial repair. Success here can be judged by the volume of efflux from the veins, at least two of which should be sutured. Divided tendons and nerves are dealt with along traditional lines. Skin closure is not essential and should be avoided if it threatens to obstruct the circulation. Primary or secondary skin grafting may be indicated. Postoperative oedema has been surprisingly uncommon, and metabolic acidosis or renal tubular necrosis have not been