Conservative Surgery for Bleeding Peptic Ulcer

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Bleeding peptic ulcer accounts for 80 to 85% of hospital admissions for gastrointestinal haemorrhage (Tanner, 1954; Avery Jones, 1957; Aird, 1957). Improved supportive therapy and greater co-operation between physicians and surgeons have lowered the mortality in this condition. Mortality is influenced by the age of the patient, the severity of the bleeding, and the site of the ulcer. Patients over the age of 50 who continue to bleed may die unless treated surgically (Avery Jones, 1947). Chinn, Littell, Badger, and Beams (1956) found that patients under 50 had a mortality of 6% for duodenal ulcer compared with 22% for gastric ulcer, and in those over 50 the mortality was 14% and 48% respectively. On the other hand, Coghil and Willocx (1960) reported a mortality of 23% after emergency surgery for duodenal ulcer.

Partial gastrectomy has been the operation most frequently employed, and in selected cases the mortality has been as low as 5% (Ogilvie, Cardoe, and Bentley, 1952). Variations in the reported mortality can be accounted for by differences in the cases studied. The average mortality in patients with moderate to severe haemorrhage from all types of ulcer treated by partial gastrectomy is probably nearer 15% (Ward-McQuaid, Pease, Smith, and Twort, 1960). Smith and Farris (1958) suggested that this might be reduced by a more conservative operation in duodenal ulcer consisting in direct suture of the bleeding vessel with vagotomy and a gastric drainage procedure. We have adopted this technique where circumstances seemed appropriate, and our experience of the surgical management of bleeding peptic ulcer is recorded.

Methods and Results

During 1960-5 117 patients with haemorrhage from peptic ulcer were treated by emergency operation. They were referred from several physicians and the criteria for surgical referral varied widely. The majority of them, however, were operated on without delay, although during this period three others died after consultation but before surgery could be performed.

Five patients had haemorrhage from stomal ulceration—three after partial gastrectomy and two after gastroenterostomy; all were treated by vagotomy and gastric resection and there were no deaths. They have been excluded from further consideration. Of the remaining 112 patients 62 were treated in Aberdeen Royal Infirmary and 50 in the Professorial Surgical Unit in Leeds. There were 78 males and 34 females, whose ages ranged from 20 to 88 years. Haemorrhage resulted from acute erosions in 13 patients, from duodenal ulcer in 79, and from gastric ulcer in 20. In six of the latter there was an associated duodenal ulcer.

The choice of operation depends on the operative findings and the surgeon's experience. The more frequent use of the conservative operation during the period can be seen in the Chart and reflects the surgeon's increasing familiarity with the circumstances in which it can be employed. Radical surgery was performed on 55 occasions, and consisted mainly of Polya gastrectomy, though Billroth I gastrectomy was more often employed for gastric ulcer. There were 57 conservative operations, usually vagotomy and pyloroplasty with suture of the bleeding vessel. On five occasions the appearance of the

pyloroplasty after dealing with a duodenal ulcer was so unsatisfactory that a gastroenterostomy was added.

The mortality from operations is shown in Table I, and there is an apparent bias in favour of conservative surgery except in the treatment of erosions. One of the criticisms of conservative surgery has been a high incidence of postoperative bleeding. This is examined in Table II, which shows no significant difference between the overall frequency of this complication in the two types of operation. Nevertheless, a considerable difference is to be seen in the results for treatment of duodenal ulcer, where five patients bled after conservative surgery compared with only one after radical surgery. Furthermore, three of these patients required a second operation because of continuing haemorrhage. Postoperative haemorrhage, however, contributed to the mortality only in the patients with erosions. Further surgery was performed for various reasons on 18 patients (Table III), one patient being operated on three times. These operations were performed more often after an initial radical operation, and there was a significant mortality associated with this, particularly in the duodenal ulcer group.

The patients were grouped, according to the degree of haemorrhage, as severe, moderate, or mild. Severe and moderate haemorrhage conform to the criteria of Shepherd (1960). The mild classification includes patients with significant haemorrhage requiring transfusion but operated on early

Number of patients with different types of bleeding peptic ulcer and the nature of the operations performed.

TABLE I.—Cause of Death in Patients Treated by Conservative and Radical Surgery for Bleeding Peptic Ulcer

Duodenal Ulcer		Gastric Ulcer	Erosions	
Radical (31)	Conservative (48)	Radical (20)	Radical (4)	Conservative (9)
Burst abdomen	Coronary thrombosis	Burst abdomen	Haemorrhage	Haemorrhage
Burst abdomen		Peritonitis		
Burst abdomen		Coronary thrombosis		
Burst duodenal stump		Respiratory		
Burst duodenal stump				Gas gangrene
				Ileus

Radical—10/55 (18%). Conservative—4/57 (7%).

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because they were known to have chronic duodenal ulcer. Others were operated on after several days because of continuing bleeding. The justification for this classification is that there was usually no great anxiety about the urgency of operation compared with the emergency posed by the remaining patients. Table IV shows that all the deaths occurred in the moderate and severe groups, with an incidence of 13% and 22% respectively. Despite the small numbers there is a clear advantage in conservative surgery for the treatment of those with moderate haemorrhage, but no real difference between the operations for severe haemorrhage. The mortality according to age is also shown in Table IV. The conservative operation has a much lower mortality in patients over the age of 50, but the Table also shows a tendency for conservative surgery to be performed more often in younger patients, particularly those whose haemorrhage was classified as mild. This may represent an unconscious bias of the surgeon in favour of trying out a new approach in the younger and fitter patient.

TABLE II.—Patients With Bleeding After Operation. *Italics Indicate Postoperative Death*

Duodenal Ulcer		Gastric Ulcer	Erosions	
Radical (31)	Conservative (48)	Radical (20)	Radical (4)	Conservative (9)
Transfused	Transfused Transfused Polya Polya Polya	Transfused Haemoperitoneum	Resect Resect B.I-Polya	Transfused Transfused Resect*

Radical—6/55 (11%). Conservative—8/57 (14%).

* Patient had two resections.

TABLE III.—Reasons for Further Operation After Different Types of Operation. *Italics Indicate Postoperative Death*

Duodenal Ulcer		Gastric Ulcer	Erosions	
Radical (31)	Conservative (48)	Radical (20)	Radical (4)	Conservative (9)
Burst abdomen Burst abdomen Burst stump Burst duodenal stump Stomal obstruction Stomal obstruction Subphrenic	Re-bleed Re-bleed Re-bleed Subphrenic abscess	Burst duodenal stump Haemoperitoneum	Re-bleed Re-bleed Re-bleed	Re-bleed Fistula

Radical—12/55 (22%). Conservative—6/57 (10%).

TABLE IV.—Mortality Related to Severity of Bleeding and Age of Patient at Operation

	Age			Severity		
	Under 50	50–59	60–80	Mild	Moderate	Severe
Radical	15	18 (4)	22 (6)	9	23 (5)	23 (5)
Conservative	29 (2)	19 (1)	9 (1)	23	21 (1)	13 (3)
	44 (2)	37 (5)	31 (7)	32	44 (6)	36 (8)

Numbers in parentheses indicate deaths.

Discussion

The problem of bleeding peptic ulcer has recently been reviewed (*Brit. med. J.*, 1965) and the operative management discussed. Mailer, Goldberg, Harden, Grey-Thomas, and Burnett (1965) have demonstrated that accurate diagnosis within 24 hours of admission is feasible, but there is no unanimity of opinion about the correct surgical approach. Encouragement to employ conservative procedures is based mainly on the reports of Farris and Smith (1960), Dorton (1961), and Foster, Hunt, and Dunphy (1964). The present study attempts to examine the merits of conservative surgery and is based on six years' experience. When operative treatment is the subject of critical analysis random allocation to treatment groups is ideal, but when established operative techniques have proved valuable the exploration of a new procedure is performed more cautiously. The approach in the present series is similar to that adopted by Foster *et al.* (1964), and our conclusions are in general agreement. Conservative surgery in bleeding peptic ulcer carries

half the mortality of partial gastrectomy. There is an undoubted bias in this study to use conservative surgery in more favourable circumstances. Nevertheless, experience allows an appraisal of the circumstances when conservative surgery can be employed.

Comparison of mortality rates in different series is difficult because of the non-homogeneous nature of the groups. The overall mortality in the present series is 12%, which compares with 14.3% reported by Ward-McQuaid *et al.* (1960) in a similar group treated by partial gastrectomy. Our mortality when using conservative surgery was 7% compared with 18% for radical surgery. Banning, Baron, Kopelman, Lam, and Warren (1965) had a mortality of 6% in a series of 49 patients treated by selective surgery. The major difference in their series was the large number of acute ulcers (21) compared with the present 13. There is little doubt that the treatment of this latter group is one of the most important considerations, and our results are less favourable.

Duodenal Ulcer

Conservative surgery was performed in 60% of patients with duodenal ulcer and only one death. The introduction of this approach has been followed by a high incidence of post-operative bleeding, necessitating reoperation in three patients. This unfavourable sequel was due to inadequate control of haemorrhage from the ulcer, a feature that may be overcome with experience, though it represents one of the major technical difficulties of the conservative operation. Foster, Hickok, and Dunphy (1965) thought that postoperative haemorrhage was as common after partial gastrectomy as after conservative surgery. Gardner and Baronofsky (1959) reported an incidence of 8% postoperative haemorrhage after Billroth II gastrectomy, and the incidence in the present series is 11%. To some extent the risk of further bleeding after conservative surgery is balanced by the likelihood of a second operation after radical surgery for other reasons. Burst abdomen, ruptured duodenal stump, and stomal obstruction complicated partial gastrectomy for duodenal ulcer and contributed to the mortality in four of the five patients.

There were no deaths in the 32 duodenal ulcer patients under 50 years of age. In those aged 50 and over there were five deaths in 22 patients (22.7%) treated by radical surgery, compared with one death in 25 patients (4%) treated by conservative surgery. In 25 patients with severe or moderate haemorrhage there were five deaths after gastrectomy (20%) compared with one in 24 patients (4%) with conservative operation. There is every indication, therefore, that this operation is the procedure of choice in the bleeding duodenal ulcer.

Smith and Farris (1958) originally introduced the conservative approach for bleeding duodenal ulcer and had no death in 21 cases. Westland, Movius, and Weinberg (1958) reported similar findings with 24 patients, but later Weinberg (1963) recorded a mortality of 5.6% in 71 patients with massive haemorrhage from duodenal ulcer. Dorton (1963) reported 100 consecutive cases with varying degrees of haemorrhage from duodenal ulcer. There were no deaths and no episodes of postoperative haemorrhage. About half the patients had major haemorrhage, and this result argues strongly in favour of the adoption of conservative surgery for duodenal ulcer.

The value of the conservative approach in all forms of bleeding peptic ulcer is less assured. Foster *et al.* (1964) found the mortality in massive haemorrhage reduced from 36 to 19% after adopting the conservative approach. However, Kelley, Grant, and Elliot (1963) in a comparative study of partial gastrectomy, vagotomy and antrectomy, and vagotomy, pyloroplasty, and suture found an overall mortality of 19% and no difference in the mortality between the three procedures. Similarly, Akin and Sullivan (1963) reported unfavourably on the use of vagotomy and pyloroplasty, 20 patients being treated,

with three deaths and three episodes of postoperative haemorrhage. In the present series the comparative mortality in two three-year periods, 1960–2 and 1963–5, shows little difference, 13.5% against 11.3%. These results, however, conceal the improvement that has obtained in the treatment of duodenal ulcer with the conservative approach.

Gastric Ulcer

We have no experience of the conservative approach to bleeding gastric ulcer. All patients were treated by resection, with a mortality of 20%. There seems no reason why the smaller gastric ulcer should not be dealt with by underrunning sutures, vagotomy, and pyloroplasty. There appears to be little doubt from the reports of Farris and Smith (1963), Burge (1964), and Hendry and Bahrani (1965) that vagotomy and pyloroplasty is often successful in the definitive treatment of gastric ulcer. In view of the high mortality of partial gastrectomy in bleeding gastric ulcer, a trial of vagotomy, pyloroplasty, and suture might be made in emergency circumstances, though we have reservations about the possibility of satisfactory control of haemorrhage from a large posterior-wall ulcer.

Erosions

The conservative approach appears most attractive in the treatment of acute erosions, yet our experience is not entirely satisfactory. Gray, Walters, Priestley, and Waugh (1953) reported on two groups of patients treated in the Mayo clinic, one by "blind" gastrectomy and the other by laparotomy alone. Recurrent bleeding was found in 11% of the former and 63% of the latter. This argues in favour of the operative management in some of these cases. Some of the difficulties encountered in dealing with this group of patients arose from failure to make a diagnosis, with delay in treatment. Diagnosis may be made by gastroscopy (Burnett, 1962), and a non-operative approach has been recommended for acute ulceration. Many surgeons, however, believe this to be dangerous, particularly in the older age groups, and, hitherto, blind gastrectomy has often been used for the treatment of this condition. Bruce and Dudley (1959) had three deaths in a group of 31 patients treated in this way, and thought that gastrectomy would remove the lesion in 75% of the patients and arrest the bleeding in most of the remainder. Gastrotomy with identification of the bleeding-point is more attractive, and Markby (1965) emphasized that erosions were constantly high on the lesser curve but were often overlooked.

There are some difficulties, however, about this apparently simple procedure. Bleeding-points are often multiple, and inspection of the whole mucosa demands a wide gastrotomy of at least 5 in. (12.5 cm.). We have no experience of the procedure of using the sigmoidoscope to inspect the interior of the stomach (Burge, 1961) and prefer, like Tibbs (1960), to empty the stomach of clot and make a careful search for bleeding. In the region of the fundus this is considerably aided by a deep retractor such as that used for pelvic operations. The acknowledged risk of blind gastrectomy is bleeding from an ulcer above the line of resection. Three of our four patients with erosions dealt with by gastrectomy re-bled; two of these required further operation, from which one died. Our experience of conservative surgery in this group is equally disappointing. Three of the nine patients had further bleeding, and two of these died. A third death in this group resulted within 48 hours of operation from a clinical picture resembling gas gangrene, though this was not proved. This patient had a hiatus hernia, and in the conservative approach to massive haemorrhage it might be advisable to leave the hernia to a later date and deal specifically with the bleeding.

The use of vagotomy in subjects with acute erosions is debatable, but in view of the frequency of multiple small lesions we believe it has merit. This might have prevented further

haemorrhage in the patient operated on three times and who subsequently died after total gastrectomy. That such a technique does not inevitably cure the ulceration, however, is illustrated by the case of a patient who died with a persistent and even larger acute ulcer at the site of an erosion originally sutured at the first operation. Though our experience of the conservative approach to acute erosions has not been as favourable as that of Foster *et al.* (1964) or Banning *et al.* (1965) we continue to use it.

Conclusion

The present study suggests that vagotomy, pyloroplasty, and direct suture of the ulcer is indicated in the treatment of bleeding duodenal ulcer. Further bleeding results from poor technique. The possibility of a similar approach to bleeding gastric ulcer should be considered, especially in the smaller ulcers situated on the lesser curvature, where it should be technically easy to control bleeding. In dealing with acute erosions consideration should be given to the adoption of vagotomy and pyloroplasty in addition to direct suture. It may be that this affords the patient immediate protection from further erosive gastritis and possibly prevents a repetition of the event in the future.

Summary

The surgical treatment of bleeding peptic ulcer over a period of six years is reviewed. Vagotomy, pyloroplasty, and direct suture of the bleeding vessel was performed in 57 out of 112 patients; and the mortality of this operation in patients with duodenal ulcer was lower than with emergency partial gastrectomy.

Recurrent bleeding was observed in eight patients after conservative surgery, four requiring a second operation. A further operation was necessary in 11 patients treated by gastric resection. Conservative surgery seems to be satisfactory in the treatment of bleeding duodenal ulcer, and warrants consideration in the treatment of gastric ulcer. The place of conservative surgery in the treatment of erosions remains uncertain.

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