Surgical aspects of gastro-intestinal haemorrhage

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THE TREATMENT of bleeding peptic ulcer by operation has been more widely adopted in the past decade. The indications for operation are now better appreciated and the results of operation have improved. The operation most frequently employed has been partial gastrectomy, but despite its general acceptance this has carried a mortality of about 15% of cases. In an effort to increase the survival, vagotomy with gastric drainage and suture of the bleeding vessel has been introduced, particularly since this operation is now acceptable in the routine management of chronic duodenal ulceration. This article deals with the experience obtained using this operation for the treatment of haemorrhage from peptic ulcer in the Professorial Surgical Units in Aberdeen and Leeds, and extends an earlier report (Caruthers *et al.*, 1967).

Materials and methods

During the years 1960-66 there were 133 patients with bleeding peptic ulcer dealt with by operation. Five of these had stomal ulceration; all survived operation and are not considered further. Of the remaining 128 patients there were eighty-eight males and forty females, whose ages ranged from 20 to 88 years. There were eighty-eight patients with duodenal ulcer, twenty-two patients with gastric ulcer and eighteen patients with gastric erosions or acute ulcer. The majority of these patients were seen shortly after admission and usually in consultation with the attending physician. There is no doubt that close collaboration between physician and surgeon in the management of this mutual problem provides the best results. The decision to operate was generally based on the criteria known to influence the outcome (Table 1). For example a patient over the age of 50 years with a duodenal ulcer admitted with haemorrhage and who bled again was generally dealt with by operation. In addition there was a tendency to operate early in patients with known peptic ulcer even if the haemorrhage was relatively slight, provided that there was a history either of previous similar complication or of disabling dyspepsia. The difficult decisions arose in the case of elderly bleeders with unre-

lated diseases such as chronic bronchitis or cardiac disorders; here the decision to operate was often influenced by the fact that delay was likely to affect the outcome unfavourably.

TABLE 1
Factors influencing outcome

Favourable	Unfavourable
Under 50 years	Over 50 years
Melaena	Haematemesis
D.U.	G.U.
Mild haemorrhage	Severe haemorrhage
Early operation	Operation after 48 hr
	Recurrence after admission
	Associated disease

The treatment of these patients by vagotomy, gastric drainage and direct suture of the bleeding vessel was introduced gradually to gain experience. Thus in the 1st year only two of these conservative operations were performed whereas in 1966 all patients were dealt with in this manner. There is no doubt that there are some technical difficulties about this operation, but this can be overcome with experience. Nevertheless this approach does mean that a comparison of the results of treatment by partial gastrectomy (radical operation) and the more conservative operation is somewhat biased, because of the selection of cases. In the early period there was a definite bias in selecting the more favourable cases in which to perform conservative surgery. However, there is still much useful information to be obtained by analysis of the results.

TABLE 2
Overall results of partial gastrectomy (radical) compared with vagotomy and suture (conservative)

	Mortality			
	Radical		Conservative	
	Total	Dead (%)	Total	Dead (%)
Duodenal ulcer (88)	31	5 (16)	57	3 (5)
Gastric ulcer (22)	20	4 (20)	2	-
Erosions (18)	4	1 (25)	14	3 (21)
Total	55	10 (18)	73	6 (8)

Results

The overall results of operation are shown in Table 2, where it can be seen that the mortality of conservative surgery in the treatment of chronic duodenal ulceration was 5% of fifty-seven patients, a very encouraging result. In patients with gastric ulcer, the tendency has been to continue with radical operation, usually Billroth I gastrectomy, and only two conservative operations have been performed, both successfully. There is no doubt that conservative operation could have been frequently employed in these patients, particularly with the ulcer in the common situation on the lesser curvature. With the large posterior-wall ulcer, seen often in elderly patients, the surgeon may be more hesitant about direct suture to control bleeding. The results of using the conservative approach in the treatment of gastric erosions and acute ulcer (Table 2) have so far been disappointing, and this appears to offer no advantage over gastric resection, though the series is very small. However, using the technique of conservative surgery where possible, and with more frequent usage as experience accumulated, the overall mortality of 8% compared with 18% after gastric resection certainly indicates that this approach to treatment warrants further evaluation.

The cause of death in patients after gastrectomy was in some circumstances probably technical error. In three cases there was a duodenal fistula and two others had wound dehiscence. One patient died of peritonitis, and two others from cardio-respiratory complications. Only one subject died of further alimentary haemorrhage. This is in contrast to three deaths from haemorrhage in the six patients who died after conservative operation. Of the remaining three patients, one died from gas gangrene and two from coronary thrombosis. There is general agreement that recurrent haemorrhage is a major hazard of vagotomy, pyloroplasty and suture, and some have abandoned the operation on this account. Early experience in the present series was such that four patients had to be taken back to theatre for further operations, usually a resection. However, the frequency of major bleeding post-operatively in the two groups was similar (Table 3) though the severity of bleeding after conservative surgery has been greater, as has been the need for further surgery to control haemorrhage. Nevertheless second operations had to be performed for various reasons twice as frequently in the gastrectomy group as in the conservative group (Table 4).

Table 5 shows the results of operation in relation to age, and the severity of the haemorrhage,

TABLE 3

Number of patients with post-operative bleeding and the treatment in the two groups (those italicized indicate a post-operative death)

	Bleeding after operation	
	Radical (55)	Conservative (73)
Duodenal ulcer	Transfused	Transfused Transfused <i>Transfused</i> Polya Polya Polya
Gastric ulcer	Transfused Haemoperitoneum	
Erosions	<i>Resection</i> <i>Resection</i> Bi-Polya (6-11%)	Transfused <i>Transfused</i> <i>Resection</i> (× 2) (9-13%)

TABLE 4

Reasons for second operations in the two groups of patients (those italicized indicate a post-operative death)

	Second operation	
	Radical (55)	Conservative (73)
Duodenal ulcer	<i>Duod. stump</i> <i>Duod. stump</i> Burst abdo. Burst abdo. Stomal obstruct. Stomal obstruct. Subphrenic	Rebled Rebled Rebled Subphrenic
Gastric ulcer	Duod. stump Haemoperitoneum	
Erosions	<i>Rebled</i> Rebled Rebled (12-22%)	<i>Rebled</i> <i>Fistula</i> (6-8%)

TABLE 5

Mortality related to age and severity of haemorrhage

	Under 50	50-59	60-88
Radical	15	18 (4)	22 (6)
Conservative	36 (2)	21 (1)	16 (3)
	51 (2)	39 (5)	38 (9)
	Mild	Moderate	Severe
Radical	9	23 (5)	23 (5)
Conservative	27	26 (1)	20 (5)
	36	49 (6)	43 (10)

both factors known to influence the mortality. So far as age is concerned conservative surgery appears to offer considerable advantage over gastric resection. The conservative operation also appears of greater benefit in patients with mild to moderate haemorrhage, but there is no difference in the results of operation in those patients suffering from severe haemorrhage. Thus any conclusions about the place of conservative operations in the treatment of bleeding peptic ulcer must remain tentative.

TABLE 6

Results of conservative surgery in patients bleeding from acute lesions

Author	Title	Treatment	Mortality %		
			No.		
Mixer & Hinton (1957)	Gastroduodenal haemorrhagic diathesis	Vagotomy	13	1	8
Sullivan, Rutherford & Waddell (1964)	Haemorrhagic gastritis	V + Py	7	1	14
Banning <i>et al.</i> (1965)	Acute ulcer	Suture	19	1	5
Foster, Hickock & Dunphy (1965)	Acute stress ulceration multiple erosions	V + Py	10	7	70
Fergusson & Clarke (1966)	Erosive gastritis	V + Py	10	3	30

The surgical treatment of acute ulcer and acute erosions is controversial. Table 6 shows some results from recent literature, and it is clear that there is some confusion with terminology. Mixer & Hinton (1957) reported dramatic results in a group of cases treated by vagotomy, some having been treated previously by gastrectomy with failure to control haemorrhage. On the other hand the type of patient seen by Foster, Hickock & Dunphy (1965) with apparently similar lesions appear to be without exception patients with serious illnesses where the haemorrhage was simply an incident in the progress. They report that all but one of their patients stopped bleeding after vagotomy, and death resulted from other causes. Banning *et al.* (1965) reported one death in nineteen patients with acute ulcer treated by suture, and since it is relatively easy to control bleeding in these circumstances this may be all that is required. The treatment of multiple erosions, or erosive gastritis may be more difficult and Markby (1966) has drawn attention to the fact that lesions are commonly high on the lesser curvature of the stomach. Recent evidence suggests that this is the type of

lesion where with ligation a vagotomy may be useful in diverting blood through shunts away from the mucosa. Since acute ulcer may be associated with gastritis a case can be made out for vagotomy and drainage in addition to suture in all these circumstances.

Discussion

Present experience with the conservative surgical approach to the treatment of bleeding peptic ulcer has been encouraging, and supports the results of Foster *et al.* (1965) who halved their mortality using this technique. The selection of cases has undoubtedly introduced a bias but there is sufficient evidence to show that further examination of the conservative method is warranted. This is particularly the case in patients with haemorrhage from duodenal ulcer. The technical difficulties in controlling bleeding through a pyloroplasty are sometimes formidable, but perhaps no more so than happens in some gastrectomies. The treatment of patients with gastric ulcer by this technique has not been adequately evaluated. The report by Dorton (1966) who had only two deaths in a series of thirty patients, should encourage further observations. The argument for performing gastrectomy because of risk of possible malignancy, may be outweighed by the present mortality figures. In any event, biopsy at the time of suture can be performed if necessary.

The operation for bleeding from established ulcer presents no real problem, and the surgeon can adopt whichever technique gives the lowest mortality. The real problem arises in those patients with haemorrhage from acute ulcer or multiple erosions (or both). An ultraconservative approach may be the correct approach where diagnosis is certain, and perhaps greater use of early barium meal examination and the fibroscope will provide this. However, there may be occasions when the surgeon is asked to deal with persistent bleeding, and the best approach is not yet apparent. Blind gastrectomy is unjustifiable, for there is no reason why a gastrotomy cannot be made in every case. Where an acute ulcer or erosions are identified these are sutured, and the operation completed by vagotomy and pyloroplasty. If no obvious cause for bleeding is found this procedure may still be justified.

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