

THE PREVENTION OF POST-OPERATIVE ULCER AFTER SURGERY FOR DUODENAL ULCER*

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Apart from the duodenal ulcer which is left *in situ* at the original operation for reasons of irresectability, and apart from those ulcers which remain in short-circuiting operations (which residu-ulcers sometimes give rise to symptoms), we must admit at the very outset that secondary or post-operative, newly formed ulcers are peptic in origin.

Whatever the contributory factors in peptic ulceration, whether they be mechanical, or vasomotor, or other, the primary factors are the gastric juices. Notwithstanding the fact that peptic ulcer has been described in a so-called anacid stomach, we are still obliged to accept that our procedure has failed in these cases because we have not adequately suppressed the erosive acid effects; that is, *that our surgical attack has been inadequate*. Let me briefly review various surgical procedures as I see them:

1. Gastro-Enterostomy

There may be amongst you those who feel with Farquharson¹ 'that the incidence of post-gastrectomy symptoms varies directly with the amount of stomach removed', and therefore give preference to gastro-enterostomy for the treatment of a surgical duodenal ulcer. I admit that good results have been obtained with gastro-enterostomy, but I have never adopted it except for the really poor-risk, old-age case who has an organic pyloric stenosis.

I think it is universally admitted that:

(a) The bulk of stomal ulcers must be debited to an original gastro-enterostomy. I need hardly refer here to statistical proof (Glenn²).

(b) We find, when we turn to the experience of the largest clinics, that that most distressing sequela to ulcer surgery, a gastro-jejuno-colic fistula, has been preceded in almost 80% of cases by a *retro-colic* gastro-enterostomy (Lowdon,³ Marshall⁴).

(c) A further drawback is that the passage of time does not afford the security one desires. After a resection stomal ulcers are prone to recur within a relatively shorter period, whereas over 50% of stomal ulcers following gastro-enterostomy occurred in the 5-10th post-operative year, i.e., *a late period* (Thompson⁵).

More and more stomal and jejunal (quite aptly called 'man-made') ulcers are discovered the longer the follow-up period after gastro-enterostomy: *a forcible reminder that only long-term assessments will offer us a true reflection of the value of any operation* for duodenal ulcer.

2. Vagotomy

Vagotomy as such has been replaced by vagotomy plus gastro-enterostomy owing to disturbances in motility caused

by vagotomy without the latter. Whether this addition to gastro-enterostomy will restore it to a competitive place in surgery for duodenal ulcer time will have to show.

I have thus far used vagotomy only in re-resections for stomal ulcer, for it seems *that these cases demand every possible additional safeguard* against the erosive effects by hydrochloric acid. Vagotomy may also be advisable in addition to resection in the young person where surgery is indicated.

3. Resection

The term *partial gastrectomy* has turned out to be an unfortunate one, for it denotes removal of anything from a small segment to a large portion of the stomach, *and, therefore interpretation of its results becomes most confusing*. This was effectively shown by Capper's⁶ survey of a large series of cases. He drew a comparison between cases with less than 70% and those with more than 70% of the stomach resected. In the Billroth II operation the difference for stomal ulcer was insignificant. The continual flush of bile over the stomach in this type of operation gives an added protection which is lacking in the Billroth I type. In Billroth I the recurrence rate was 8.2% for the smaller resections, and 0.9% for the large resections.

Then again, the term 'subtotal resection' conveys a *too total* conception. The history of gastric resections started with a truly partial sacrifice of this viscus. As time went on and post-operative ulcers were still developing, more stomach was extirpated. The portion of the stomach resected increased from one-half to two-thirds, and then to three-quarters and more than three-quarters. The less of the stomach left, the more frequently the patient presented with other post-operative morbidity: dumping, and inability to regain body-weight. It is at this cross-road in the problem of resection that we have arrived today!

Because of all this confusion I want to submit that the time has arrived when we are compelled to come to some definite agreement regarding the extent of our resection. It is useless persisting in talking about 'partial gastrectomy' when we really do not know what exactly we are talking about!

Unfortunately there are no precise anatomical points to select as our landmarks. Attempts at exact measurement (by the use of a polar planimeter) have for practical reasons not replaced the surgeon's guess.

May I emphasize that it is folly to gauge the extent of a resection by checking on how large a portion of stomach is removed. One must assess the extent by *what remains*. The fundic portion is the least visible part of the stomach, and one must actually see this portion clearly. This is best accomplished by bringing it down together with the spleen

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into full view, placing a large abdominal swab above these structures, and *then* choosing the point of transection on the greater curvature.

What I leave, after my resection, is slightly less than the size of my fist for Billroth I, and no more than the size of my fist for Billroth II (Fig. 1). Since adopting this policy I have felt less uncertain of what I actually should attain. I now have something definite to designate an 'adequate resection'.

Distally there is no uncertainty. It is plain to all of us that we *must* go beyond the pylorus. There is sufficient evidence in the literature to show that failure to remove this section of stomach completely contributes to maintained delivery of the hormone gastrin, and that such antral remnants definitely increase the incidence of stomal ulceration (Marshall⁷).

Removal of the duodenal ulcer itself is a moot point. My aim is to remove it wherever possible. There are authors (Strauss,⁸ Glenn,² Thompson⁵) whose impression it is that stomal ulceration is more frequent after exclusion than after removal of the duodenal ulcer. But, more important is the possibility of haemorrhage from an excluded ulcer. Marshall,⁴ in reviewing the cause of death in 51 fatalities following resections, quotes 2, that is 4% of deaths, as a result of such haemorrhage.

I try to get distal to the ulcer in all cases, especially in a bleeding ulcer. I try to obtain a finger-breadth of intact posterior duodenal wall by inserting my left index finger into the lumen and dissecting on it in order to have sufficient margin for a Billroth I anastomosis, to which I am at present still inclined to give preference. The incidence of stomal ulceration after an *adequate* Billroth I resection must still be established. Less post-operative morbidity, and a shorter period of sequelae seems to be in its favour. The difficulties of dissection of the duodenal stump are the numerous small bleeders; it is a minute step-by-step dissection. The danger, to my mind, is not so much the common bile-duct (so often stressed) as the duct of Santorini which, in a number of cases, may form the main pancreatic duct.

BILLROTH I AND II OPERATIONS

Technically 3 basic criteria must be satisfied for both the Billroth I and II operations:

1. No tension. I invariably commence mobilization high up along the greater curvature just below the short gastric

vessels which run to the superior pole of the spleen. This solves practically all my problems on this point (Fig. 2).

2. All knots and suture-material of the posterior sero-serous layer, even using catgut as I invariably do, should be buried by the overhanging muco-mucus layer. Material projecting into the lumen sometimes forms a predisposition to ulceration. I have seen these stomal ulcers with a silk suture projecting from the centre.

3. No damaged tissue should be employed at the stoma. Clamped or crushed tissue should be excised, and viable epithelium applied to viable epithelium.

Any duodenal stump not suitable for a safe Billroth I anastomosis forces the surgeon to the Billroth II procedure. 'Blow-out' of the duodenal stump as a 20% contribution to fatalities must be borne in mind in Billroth II. In performing a Billroth II anastomosis I never employ a retro-colic anastomosis. I fully realize that tissue susceptibility increases with the distance from the pylorus, but one's chances of a gastro-jejuno-colic fistula are ever so much less, and an eventual re-resection for stomal ulcer is so much easier, after an ante-colic anastomosis.

Further, I attach great importance to the location of the completed stoma in Billroth II. By drawing the transverse colon and omentum through well to the right, one firstly avoids the ante-colic jejunal loop becoming adherent to the laparotomy scar and causing trouble; and secondly one directs the loop in an even horse-shoe curve carrying the efferent limb to the left para-colic gutter (Fig. 3) thus minimizing torsion, internal herniation and similar mishaps which may follow the Billroth II anastomosis. I utilize the Finsterer type, right to left anastomosis, making the stoma no larger than for the Billroth I.

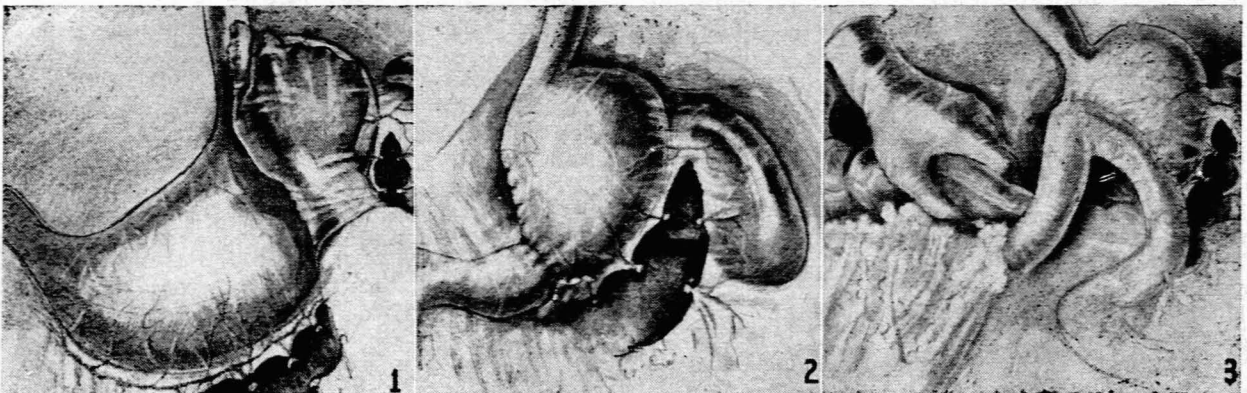
All cases stay on probanthin therapy for 3 weeks post-operatively, and on mashed, non-stimulating food for 3 months.

SUMMARY

A. An inadequate Billroth I resection increases the percentage of stomal ulcer.

B. A too drastic Billroth II resection increases and prolongs post-operative morbidity.

Finally, what about a less radical (40%) resection plus vagotomy? Again, time will have to show. Edwards⁹ has reported some 300 cases of Billroth I and II with no stomal ulcer. But the finding that 26% of cases of gastro-entero-



Figs. 1, 2, and 3. Stages in Billroth operations.

stomy plus vagotomy show a return of acid to pre-operative levels after 4 years (Mayo clinic¹⁰) makes one hesitant. Long-term results should show the way.

For the treatment of recurrent ulcer I perform a thorough re-resection plus vagotomy.

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