Vagotomy and Pyloroplasty

Few operations have given rise to such varied opinions as vagotomy. When it was found that the operation would reduce not only the appetite juice but also the volume of the basal day and night secretion, high hopes were entertained that this might provide a solution to the duodenal ulcer problem, particularly for those younger patients with duodenal ulcer who had a high acidity and rapidly emptying stomach, the type generally considered least satisfactory for surgery.

It was soon found by those surgeons who performed vagotomy alone that in the majority of cases, discomfort in the nature of a sensation of epigastric fullness, foul 'sulphurous' belching, abdominal cramps, diarrhoea etc., might occur, and that in a high percentage these symptoms were still present at the end of a year or more. The cause of these symptoms was basically the combination of a lowered acidity with gastric atony and delayed emptying. The symptoms in some respects resembled those of an achlorhydric stomach partially obstructed by a pyloric carcinoma.

It was evident to most surgeons that these symptoms were so unpleasant that unless they could be overcome the operation must be abandoned. Therefore one or other causative factor had to be eliminated. Administration of large doses of acid was impractical and would remove the chief and possibly the sole advantage of the operation. Therefore, by some means, gastric emptying had to be improved.

Various parasympatheticomimetic drugs were used with indifferent success. Dietary regimes of small dry meals with occasional periods of starvation or courses of gastric lavage ameliorated but did not settle the problem.

Some surgeons had combined the vagotomy with gastro-jejunostomy or partial gastrectomy, and in these cases the post-vagotomy gastric retention symptoms were slight or absent. The disadvantage of gastro-jejunostomy is that we do not even yet know if vagotomy is adequate protection against jejunal ulceration. Certainly stomal ulcer occurs at times when the operation is combined with gastro-jejunostomy. Furthermore it is the opinion of some surgeons that a coincidental gastro-jejunostomy increases the chance of trouble from post-operative small intestinal ileus—possibly swallowed air may enter and distend the paretic small bowel faster than the post-operative gastric decompression can deal with it. To add a gastrectomy to an adequate vagotomy is to increase morbidity and mortality, and for 97 out of every 100 who have the combined operation the vagotomy is an unnecessary adjunct.

The present writer, when commencing to perform vagotomy decided that, as the operation was somewhat in the nature of an experiment, he would do pure vagotomies only, because combining it with gastro-jejunostomy would confuse the results, for there is no doubt that gastro-jejunostomy cures duodenal ulcers even though in a certain percentage it gives rise to anastomotic ulceration. However, in those cases of duodenal ulceration where there was gross duodenal narrowing, some accessory operation was obviously required and for these a simple Heineke-Mikulicz pyloroplasty was performed. This entails a simple longitudinal incision through the scar and pyloric muscle, which is sutured transversely. It is an adequate method of treating stenosis, but has certainly no great reputation for the cure of stenosed duodenal ulcer and so any longstanding beneficial results from the combination of vagotomy with pyloroplasty could rightly be attributed to the vagotomy. It did not take long to find that the cases of pure vagotomy had many retention symptoms, whilst those combined with pyloroplasty were almost symptom-free. Therefore after 9 to 15 months many of the cases of pure vagotomy were operated on again, it being suspected that in the worst cases the ulcer had healed and stenosed. However, in nearly all cases it was found that the ulcer was healed, but was not in the least stenosed and there was no evident cause for the prolonged delay in gastric emptying. In view of the success of the pyloroplasty cases, a simple pyloroplasty was performed on these cases. In the majority of cases relief was rapid, though in cases in which severe retention had been present over a year, it might take up to three months for maximal benefit to appear. The belching of foul flatus disappeared.
As a result of these experiences the writer, in common with many other surgeons, abandoned pure vagotomy and now always combines it with pyloroplasty. Occasionally an active anterior ulcer may be encircled by the incision and removed in order to leave a less scarred duodenum. In rare cases the deformity may be so extreme as to make simple pyloroplasty a formidable operation; in such cases a Finney pyloroplasty, or a gastrojejunostomy may be the wiser procedure.

It is unlikely that vagotomy will relieve the average case of gastric ulceration. It is important, therefore, not to miss a small coincident gastric ulcer at the time of vagotomy. It is not unlikely that some of the gastric ulcers now reported as appearing after vagotomy were present as impalpable lesions at the time of the vagotomy. The pyloroplasty incision gives an added means of excluding such ulcers, for a finger may be inserted into the stomach and the lesser curve palpated—a far more reliable method of exploration than from outside the stomach. The vagotomy should be done before the pyloroplasty and so an ulcer found by this means will be discovered after the vagotomy has been performed. Whether the surgeon should then proceed to gastrectomy or be content with the pyloroplasty is a matter of opinion, but at any rate a truer record of the lesion will be obtained.

Why has pyloroplasty this very fortunate effect? It certainly does not act merely as a means of overcoming scar contracture because gross stenosis is not a feature of most of the cases. If gastric atony and incomplete gastric peristalsis are the cause of the gastric retention it is difficult to see why the pyloroplasty should affect matters, particularly as some observers have claimed that the pylorus itself was atonic.

A possible cause of the delayed emptying is that the vagotomy diminishes gastric tone, but the tone of the pylorus is maintained or even increased by the undamaged sympathetic system, so that there is either a relative or real pylorospasm. In such a case it becomes more evident why division of the pyloric sphincter should improve gastric emptying, though in view of the gastric atony which follows vagotomy it is still hard to see why pyloroplasty should produce such normal emptying times. The emptying time of a barium meal may be reduced by it from 12 or 24 to 3 or 5 hours.

At the 1950 Meeting of the Association of Surgeons of Great Britain and Ireland, the present writer suggested that pyloroplasty may act not merely by removing an obstruction to the gastric chyme, but it may act by equalizing intraduodenal and intragastric pressures. In the normal subject, many of the gastric waves are incomplete and insufficient in themselves to drive chyme through the pylorus even if the pylorus relaxes in front of the wave. Therefore a certain intragastric pressure must be gradually built up, to equal that in the duodenum, before emptying into the duodenum takes place. In the vagotomized stomach even greater difficulty would be experienced. It is suggested that the pyloroplasty by throwing the proximal duodenum and stomach into one cavity unseparated by a sphincter, allows the pressures to equalize, so that the gastric chyme may overflow into the duodenum. Once in the duodenum the much more efficient waves of peristalsis relatively unimpaired by the vagotomy may allow the chyme to be carried on.

The true and proven cause of the improved emptying must await further observation and research. Meanwhile there is no doubt that pyloroplasty offers a simple and safe method of overcoming most of the at present known after-effects of vagotomy, and furthermore is a method which is unlikely to lead to confusion as to the efficacy or otherwise of vagotomy in preventing ulcer.

NORMAN TANNER, F.R.C.S.
London.
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Norman Tanner

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