Discussion

Dr. Francis E. Rosato (Norfolk, Virginia): I think Drs. Vansant and Baker are to be commended on the continuing and very critical review of their own most extensive experience with antireflux surgery. The initial advocacy of adjunctive vagotomy was a part of the so-called "balanced approach" to hiatus hernia reflux problems, wherein it was hoped that the correction of reflux and its pathology could be improved upon if the acid content of any residual reflux were to be minimized. In fact, there has appeared no significant literature to support the notion of increased acid secretion in patients with reflux problems, and over the years increasing attention has focused on the restoration of the lower esophageal sphincter pressure, and less and less attention has been focused on acid reduction.

I therefore emphatically restate Dr. Vansant's conclusion, and point out that acid reducing procedures in the course of correction of reflux problems should be reserved to those situations when such procedures would stand against the conventional criteria for their performance; namely, for acute peptic acid disease. Vagotomy does exact a price in the form of unpleasant symptoms. These symptoms do persist for some time, as we see from this review.

In our experience with the Hill posterior gastropexy, evaluated manometrically, we have been able to confirm the restoration of lower esophageal sphincter pressures to within 80% of the normal range. Equally important, we have shown a restoration toward a normal of the lower esophageal sphincter pressure in response to increases in intragastric pressure. In normal man, an increase in intragastric pressure produces an approximate twofold increase in lower esophageal sphincter pressure, thus guarding against regurgitation. The preoperative response in our own study group of patients was 0.5; that is, an increase in intragastric pressure produced only one half as much increase in lower esophageal sphincter pressure. After the performance of the Hill gastropexy, the ratio was restored to one-to-one, which is considerably improved over the preoperative status, and did correlate with the absence of reflux on x-ray.

Again, I would like to thank Drs. Vansant and Baker for this most informative presentation. When faced now with the age-old question, "What approach do I take to the repair of hiatus hernia?" I think the answer emphatically is: "Repair the lower esophageal sphincter, and thus restore its normal function. Reserve acid reducing procedures to those situations which would warrant them, irrespective of and independent of the reflux problem." Those situations, I believe, are relatively infrequent.

I would ask just one question of the presenters: How do they manage those patients who, after the performance of an antireflux procedure, show evidence by x-ray, of reflux but are free of any symptoms?—since I believe they have a few such patients in their presentation.

Dr. Otto C. Brantigan (Baltimore): It is with reluctance that I speak about diarrhea to this astute audience. However, we have heard a lot about it this morning as related to vagotomy.

I have had the experience in the last six or seven years with about 350 selective gastric vagotomies for various causes and one does learn something about diarrhea.

The gastroenterologists state that, following pyloroplasty alone or pyloroplasty with vagotomy, there is a change in the bacterial flora in the terminal ileum. The flora can be altered by the use of tetracycline. I can verify this fact, that after selective gastric vagotomy, if the patient has diarrhea, the diarrhea will be promptly controlled by tetracycline, 250 mg, four times a day. The response is prompt and need not be continued for more than five days. If and when diarrhea reoccurs in a patient, it will respond to a repeat course of tetracycline. I suggest you try it.

Allow me to say a few words about truncal vagotomy. One of the reasons I could never accept truncal vagotomy in the treatment of many gastric problems was the complications that occurred with it. Yet when you read the literature, you believe that there is no difference between the two. There are differences. The persistent diarrhea that occurs after truncal vagotomy is one of the important differences. In my experience, zinc sulfate will control it.

It is with reluctance that I disagree with the authors on the ill effects of vagotomy as a part of the treatment of esophagitis with gastroesophageal reflux. Gastroesophageal reflux as the etiology in esophagitis is similar to gastric acidity, as the etiology in peptic ulcer of the stomach and duodenum. It is not the whole cause. Truncal vagotomy has many side effects that do not occur with selective gastric vagotomy. Vagotomy does change the character of the gastric contents that is refluxed. In my experience, selective gastric vagotomy has been useful as a part of the operation for reflux esophagitis.

Dr. Edward R. Woodward (Gainesville, Florida): We began using vagotomy and drainage operation along with hiatal herniorrhaphy in 1954. It was only in retrospect, 15 years later, that we became aware 1) that the results in patients with and without vagotomy were no different in terms of control or recurrence of esophagitis, and 2) that the side effects were considerably increased by the additive surgery.

The only disagreement we have with the essayists is, first, dysphagia has been no more frequent with or without vagotomy in our experience, and it has been temporary in all cases. Secondly, we haven't noted any difference in either anatomical or clinical recurrence of hiatal hernia, with or without vagotomy.

It has been our experience that dumping has actually been about twice as frequent as diarrhea in complicating the patient who has had the added procedures.

In retrospect, I think it's clear that the esophageal mucosa is so tremendously sensitive to acid-pepsin that not only the interdigestive secretion of acid but the postprandial secretion of acid is important in its pathogenesis. Of course, this corresponds to the characteristic symptomatology of the patient, i.e. their symptoms are generally postprandial.

So we would state even more strongly than the essayists that vagal denervation of the stomach does not favorably effect reflux peptic esophagitis, that the amount of acid produced by the stomach is unimportant, as long as the surgeon accomplishes his objective of restoring the competence of the lower esophageal sphincter. We carefully preserve the vagi with our antireflux operations, unless the patient actually has a surgically significant duodenal ulcer.

Dr. John L. Sawyers (Nashville): Dr. Vansant has conducted an extensive review of a large number of patients who have undergone hiatal hernia repair by the Hill technique. Approximately one half of the patients had truncal vagotomy, with three fourths of the vagotomy patients having pyloroplasty, and one fourth a gastric resection.

About 20 years ago, Dr. Jacob Berman, of Indianapolis, advocated the balanced operation for hiatal hernia. This consisted of a hiatal hernia repair by posterior crural suture, reconstruction of the angle of Hiss, truncal vagotomy, and pyloroplasty. Dr. Lynwood Herrington and I did several such operations in the late 1950's and early 1960's, and about ten years ago Dr. Ed Meads and I reported our results in 70 patients who had had a balanced procedure.

We thought that the results were better than those following hiatal hernia repair alone. This was before surgeons began to understand the lower esophageal sphincter mechanism, and before the effective antireflux procedures of Hill, Nissen, and Belsey. The balanced procedure of Berman accepted the fact that posterior crural repair did not always control reflux, and hoped that by lowering gastric acid secretion with vagotomy, and by doing a drainage procedure for rapid emptying of the stomach, patients would remain asymptomatic even if reflux still occurred.

As Dr. Vansant has pointed out, the accompanying vagotomy and drainage led to other problems, dumping and diarrhea. I do not think that the dumping symptoms are related to vagotomy, but occur because the integrity of the pylorus as a sphincter has been compromised. Truncal vagotomy, as we know, does alter bowel habits in a majority of patients, and may cause diarrhea in some.

We agree with Dr. Vansant that truncal vagotomy and the complementary procedures of pyloroplasty or resection are no longer indicated in patients requiring operation for gastroesophageal reflux. We prefer the Nissen fundoplication, rather than the Hill posterior gastropexy or

the Belsey Mark IV operation, but all three operations are effective antireflux procedures.

In patients with active duodenal ulcer disease and gastroesophageal reflux, we would advocate parietal cell vagotomy with a fundoplication. Parietal cell vagotomy without drainage, as we heard from Dr. Paul Jordan this morning, is seldom accompanied by dumping or diarrhea. It is effective in healing duodenal ulcer. However, unless patients have a duodenal ulcer, or symptomatic gastric acid hypersecretion, there is probably no need for any type of vagotomy, but only an effective antireflux operation.

DR. JOHN W. BAKER (Closing discussion): Dr. Vansant and I appreciate the comments by all discussants, and I'd first like to address Dr. Rosato's question. He asked how we would manage the asymptomatic postoperative patient who is noted incidentally on postoperative GI series to have reflux of contrast material.

In general, we feel that the radiographic demonstration of gastroesophageal reflux is very significant, since it usually occurs only in patients with gross free reflux, and since the test is so apt to miss more subtle reflux. We also suspect, however, that reflux can be induced by manipulative means in many normal individuals. Therefore, our interpretation would depend upon the gymnastics that a particular radiologist performed. Should significant free reflux be demonstrated in the asymptomatic patient, we would be inclined to follow this patient carefully by clinical history and perhaps, re-endoscopy. We certainly would be concerned if we could find objective signs of continued marked esophagitis or stricture formation; however, in the absence of these findings, it would be very difficult to improve this asymptomatic patient's clinical situation.

Dr. Brantigan, we have not routinely used tetracycline for postoperative diarrhea, but will do so. I'm aware of your use of zinc sulfate, but, again, we have not used this, and look forward to doing so.

I enjoyed listening to Dr. Woodward's comments. I think after reviewing his paper presented here several years ago, that our paper further documents what he has previously said, and we agree with him wholeheartedly.

He mentioned that he had not had a higher incidence of dysphagia in patients who had had vagotomy in his series. I'm not sure that we have meaningful data on this, although we did have 42 patients who presented without preoperative dysphagia who postoperatively did have dysphagia. Only five patients, however, had persistent dysphagia, longer than three to six months, and all of those patients had vagotomy. I really am not sure how to interpret this.

I would also emphasize, as has Dr. Woodward, that we do indeed carefully preserve the vagus nerves in the performance of the Hill operation.

I'm very grateful to Dr. Sawyers for agreeing with us so much, and cannot take issue with him at all.

In summation, then, I would say that we feel this evidence further supports the evolved concept that gastroesophageal reflux and duodenal ulcer are two distinct clinical entities. We believe that this data is an indictment of vagotomy in the treatment of gastroesophageal reflux, on the basis of 1) its failure to prevent recurrence; and 2) on the basis of the long-term morbidity that we have seen with the use of vagotomy with antireflux procedures.

As a secondary emphasis from this material, we do endorse the transabdominal, posterior gastropexy for the management of gastroesophageal reflux—that is, the Hill repair—on the basis of its striking lack of long-term morbidity and a reasonable recurrence rate in our hands.

In addition to using this operation for straightforward gastroesophageal reflux, we are also using it for recurrent reflux following antireflux procedures which have been done either transthoracically or transabdominally, and are very pleased with those results. We are also using this in the management of dilatable esophageal strictures.