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Discussion

DR. J. PATRICK O'LEARY (New Orleans, Louisiana): Vice President Haller, Secretary Copeland, Professor Wood, and Dr. Hunter. I would like to take this opportunity to thank the authors for the chance to review their manuscript.

Gastroesophageal reflux is a mechanical disease. It is a mechanical abnormality, and it is really good to see that a repair of the mechanical problem produces symptom relief. You have heard a number of people talk about hallmark studies that are being presented at this meeting. But this is truly an important presentation. It is the largest U.S. study that has been reported with regard to laparoscopic treatment of esophageal reflux. I view this as a feasibility study. As such, I think it has clearly shown that it can be done laparoscopically. It can be done safely. The results are similar to those done in an open procedure, and, in fact, a 97% good-to-excellent result is a remarkable achievement.

It would suggest that these results are maintained at 1 year, the hospital stay is short, and conversion rate to open is infrequent. I have three questions.

In the manuscript, it is clearly identified that the quality of life of these patients before the operative procedure is horrible. I wonder, Dr. Hunter why is that? What negatively impacts on the lifestyle of these patients? Why would correction of the reflux improve that?

There are 300 patients in this study accrued over 4 years. That is one every 4 days. Where have these patients been? They certainly do not seem to be in my practice. I guess they sort of emanated from the woodwork.

You describe several patients with migration of the fundoplication. In my experience with open cases, the migration is of the stomach up through the wrap. But in your discussion, it seems that the wrap itself is heading north. Will you try to expand that?

This study goes a long way toward establishing a laparoscopic procedure (Nissen) as a standard for the treatment of patients with esophageal reflux. As an individual who has spent a great deal of my academic career treating this disease through a laparotomy incision, the study is a little bit distressing. However, if tomorrow I personally developed reflux symptoms, I would find the possibility of having the procedure done laparo-

scopically attractive; however, at this stage in our understanding of the development of this procedure, I probably would schedule a trip to Atlanta.

Thank you very much for the opportunity of discussing this paper.

DR. HENRY L. LAWS (Birmingham, Alabama): Dr. Haller, Dr. Copeland, Members. I think that, number one, I want to congratulate Dr. Hunter and Dr. Wood and their colleagues for what I think is a spectacular series.

My first question is: Where do all these patients come from; or, more appropriately, where have they been?

I do know that we see personally many patients that seek our attention without doctor referral, meaning that there are a lot of unhappy people out there.

When do you do a Toupet operation specifically? How does the ease of that operation compare with the Nissen fundoplication? I have now randomized 40 patients between those two operations, and I have not come to any conclusions. But I would like to know what you think about the ease of the two operations.

I believe that one of the big measures or one of the great contributors to your favorable results is your very careful workup of each patient. You must have rejected many patients to get to these 300 people, because those results are absolutely spectacular.

I might note that approximately 3 years ago, Spechler and colleagues reported in the *New England Journal of Medicine* on a randomized trial of medical versus surgical therapy. They found both to be effective, but surgery to be superior (Spechler SJ, Department of Veterans Affairs Gastroesophageal Reflux Disease Study Group. Comparison of medical and surgical therapy for complicated gastroesophageal reflux disease in veterans. *N Engl J Med* 1992; 326:786-792).

I would like to thank the Association for the privilege of commenting on this excellent paper.

DR. EDWARD M. COPELAND (Gainesville, Florida): In your illustrations, the blood supply to the greater curvature of the stomach has been severed. I can recall a gastric fistula that resulted from such devascularization and have, personally, tried to avoid ligating the short gastric vessels unless absolutely necessary for adequate mobilization. Have you had any complications from partial gastric devascularization?

Secondly, is this operation applicable to reflux in children and if so, do you handle mobilization of the greater curvature in the same way and if so, have you had any splenic injuries?

DR. JOHN G. HUNTER (Closing Discussion): Dr. Haller, Dr. Copeland, Members, and guests. Thank you very much for your kind questions and comments. None of my patients have been from New Orleans. They have been from all other points in the South, but I think New Orleans is being very well treated.

Before I go any further, I really would like to offer my sincere thanks and gratitude to my chairman and my friend, Dr. Wood, who had the courage and the great kindness to offer to present this work before this audience. I would also like to thank my assistant Cindy Lyon for her 11th hour work and my

associate, Ted Trus, who is an up-and-coming star in gastrointestinal surgery.

Clearly, it is hard to summarize 4 years of work in 10 minutes, but I appreciate Dr. O'Leary's question about the quality-of-life data reported in this manuscript. Rather than give a second paper—I promise not to do that—let me summarize our findings with the Short Form-36 (SF-36). This global quality-of-life scale is broken down into eight individual fields, and all eight fields provided similar results in our reflux patients. Patients poorly controlled with medical therapy and patients well controlled with medical therapy have statistically identical quality-of-life scores which were—generally—lower than a population with congestive heart failures. In fact, the data analysis center said that these scores were the lowest they had ever seen. Why do these patients have such poor quality of life? If you look at each field, you will see that reflux patients score very low in vitality, physical stamina, and social functioning. They do not sleep well at night, they're up in a chair most of the night. They have to eat early and therefore cannot go out for a late dinner. Six weeks after laparoscopic Nissen fundoplication, our patients overshot the normal controls (perhaps very gratified to have survived their operation.) Scores obtained from our patient population 1 year postoperatively are identical to a general control group of healthy volunteers.

Dr. O'Leary's second question, which was echoed a number of times, is where do these patients come from? I think the first way to look at this is the experience of the surgeon. If you looked at laparoscopic cholecystectomy you found many, albeit young, surgeons who would probably have been unlikely to do 25 gallbladders in a year posting huge series of 250 or more cholecystectomies, annually. To a certain extent, the same phenomena has occurred in fundoplication. This phenomenon is the result of focused practice, and a concentration of training which involved travel around the country and around the world, especially to South America and Europe, learning how other surgeons approach this operation. From these experiences, a "hybridized" technique evolved. The second reason for large numbers is patient preference. If you look at the Veterans Affairs cooperative trial that Dr. Laws referred to, 30% of patients who were randomized to surgery said "no" to open fundoplication. Thirty percent did not want a laparotomy. As with laparoscopic cholecystectomy, many patients with surgical indications refused conventional surgery but embraced laparoscopic surgery. I sent all of these patients back to their gastroenterologists postoperatively. The gastroenterologists were generally happy with the results. All of a sudden, they started referring patients in batches of five, not one at a time. This is how such a large series starts.

Once started, we assembled the building blocks for a swallowing center with the help of surgeons like Gene Branum, gastroenterologists like Pat Waring, radiologists, otolaryngologists, speech pathologists, and a host of nurses to get these patients well evaluated and well taken care of.

What about the slipped Nissen? The slipped Nissen has not occurred as frequently in this series as one sees in open fundoplication. The more common complication is that the fundoplication occasionally herniates through the diaphragm. There were five patients in this series who were symptomatic,

but I suspect that there were at least ten others with wrap herniation who were asymptomatic. The most common reason for this complication is vomiting. Several patients have been obese. There has been a deterioration of the crural repair in a few. Adhesions occur with an open operation, helping fuse the fundoplication in the abdomen. When we have reoperated on patients who have developed fundoplication herniation after laparoscopic Nissen, there are remarkable few adhesions and we are able to pull the fundoplication down laparoscopically. Lastly, patients with large hiatal hernias and/or advanced esophageal disease (Barretts/stricture) are prone to have a foreshortened esophagus that may retract through the crural repair postoperatively.

When do we use the Toupet procedure? I think there are two questions about motility in that regard. Classically, patients with poor preoperative esophageal motility have been recommended to have a Belsey or Toupet type partial fundoplication. This operation is slightly harder to perform, and given the uncertain long-term efficacy of partial fundoplications, we prefer the Nissen procedure for patients with adequate esophageal motility.

Dr. Gadacz noted that those patients who had poor motility seemed to do just as well, whether they had a Nissen or Toupet. I think this is very fertile area for further research. There have

been three very provocative retrospective studies published in the literature. One by Ross Bremner, one by André Duranceau, and another one from Phil Donahue, all of whom report small series of patients with aperistalsis in whom a floppy Nissen fundoplication provided no more than the expected rates of dysphagia. In patients with achalasia, we perform a Toupet fundoplication after Heller myotomy. We rarely use pledgets except in the large paraesophageal hernias in which we are closing the diaphragm under some tension. Patients with Type III (mixed) paraesophageal hernia were not included in this analysis. We have performed laparoscopic repair in about 30 of these patients, with acceptable results but an increased complication rate. The only gastric perforation we had from ischemia was in this group. An 80-year-old woman with a chronically incarcerated hernia and a high greater curvature ulcer perforated this ulcer on her fourth postoperative day. Perhaps dividing the short gastric vessels rendered her fundus more ischemic, but such is a rare complication. In the patients reported in this series, taking down the greater curvature has not created any serious complications.

We have performed laparoscopic Nissen fundoplication in a few adolescents, but not in infants yet. We are working with our pediatric surgeons, Dr. Heiss and Dr. Ricketts at Egleston Children's Hospital, to further this experience. Thank you very much for your kind questions.