

bilirubin.<sup>11</sup> The effect of proton pump inhibitors on reflux of other components of duodenal juice, especially pancreatic fluid, is not known. In duodenal juice, however, the only injurious components are trypsin, lipase, lysolecithin and bile acids, which are clinically important and may contribute to the development of complications and even to carcinogenesis of Barrett's esophagus.<sup>12</sup>

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May 12, 1997

Dear Editor:

We have read with satisfaction the article by Willekes et al.<sup>1</sup> The authors reported a prospective study of 30 patients who underwent elective laparoscopic repair of type II paraesophageal

hernias. They showed that a laparoscopic approach can offer an excellent treatment option for this serious problem. Opinions differed regarding three important technical points concerning the repair of these hernias. In concert with the authors we would like to stress that the surgical principles established during conventional surgery should always be followed: resection of the sac, obtaining sufficient length of the esophagus into the abdomen and performing an adequate crural repair with or without the use of mesh.

There are two other issues that require more discussion. There is doubt as to the need to routinely include a fundoplication as part of the surgical repair of the paraesophageal hernia. Many authors propose to only add an antireflux procedure in those patients who have symptoms due to gastrointestinal reflux. This traditional precaution of selectively performing a fundoplication is an attempt to avoid complications derived from this procedure. Because diagnostic tests that are routinely used preoperatively to demonstrate reflux are notoriously unreliable in the presence of huge hernias, a standard diagnostic armamentarium may not correctly identify hernia patients that may benefit from such an anti reflux measure. Conversely, three out of seven patients in the series of Willekes et al.<sup>1</sup> who were asymptomatic developed reflux complaints after anatomical repair. This observation urged the authors to routinely add an antireflux procedure in their last 23 asymptomatic patients, and postoperative reflux complaints were not observed.

However, the most important issue after paraesophageal hernia repair remains its recurrence. A recurrence may lead to unpleasant surprises such as a gastric incarceration and even necrosis. The true incidence of occurrence may well be underestimated in the literature because usually only symptomatic patients undergo postoperative gastrointestinal radiography or endoscopy. In addition, many authors report no recurrences; yet it is possible their follow-up is too short to draw valid conclusions. During a crural repair one stitch too much may result in dysphagia, whereas in contrast a recurrence may occur if one stitch is omitted. Therefore, a standard gastrotomy or gastropexy has been recommended by many authors to minimize the risk of recurrence in both open<sup>2,3</sup> and laparoscopic repairs.<sup>4,5</sup> The statement "a nonfixed stomach will, by virtue of the resultant of a positive intraabdominal pressure and a negative inspiration pressure, herniate into the mediastinum" seems a reasonable argument in favor of the use of a gastropexy. Willekes et al.<sup>1</sup> do not recommend a gastropexy procedure, based on the results of Williamson et al.,<sup>6</sup> who showed a similar recurrence rate (about 10%) in groups of patients with or without a fixation procedure. However, the latter author pointed out how difficult it is to estimate the actual number of recurrences if the study is retrospective, particularly since postoperative gastrointestinal radiography has only been performed in less than one-third of the patients.

After a laparoscopic pilot study in which a substantial number of recurrences were observed in patients that had not undergone a fixation procedure, we operated on 17 patients with paraesophageal hernias and added both a Nissen antireflux procedure and a Nissen anterior gastropexy. Postoperative radiography was performed systematically in all patients. No recurrences occurred during a one year of follow-up.

In summary, we strongly believe that principles derived from the conventional procedure have to be followed in the laparoscopic treatment of paraesophageal hernias. Moreover, an an-

tireflux procedure has to be performed because the diagnosis reflux esophagitis is difficult to demonstrate during the preoperative workup. Finally, the use of a gastropexy may prevent a recurrence.

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## Authors' Reply

I have reviewed the letter submitted by M. Van Den Berg and his associates from the Department of Surgery, Free University Hospital in Amsterdam. We are in full agreement with most of his conclusions.

It is still our opinion that the prevention of recurrence is much more dependent on the extent of esophageal mobilization that is aided when the hernia sac can be completely excised from the mediastinum. In our original 30 patients reported in the *Annals of Surgery* in January of 1997, we had included fixation of the wrap to the diaphragmatic crura only in those patients who underwent toupet fundoplication. In patients undergoing the Nissen fundoplication it was our practice to suture the wrap to the esophagus as had been usually done in the open operation.

Since publication of that paper we have performed laparoscopic repair of paraesophageal hernias in 43 additional patients, and we now routinely suture the wrap to both diaphragmatic crura and to the gastroesophageal junction.

We have not routinely obtained postoperative upper GI studies on these patients and have only done so in cases where the patients developed worrisome symptoms such as chest pain or difficulty swallowing. In those patients whom we have studied, we have not noted any recurrences or abnormalities to explain their symptoms.

Although fixation of the fundoplication within the abdomen is probably helpful in preventing recurrence, care must be exercised to assure that a fixed angulation of the distal esophagus does not result from such fixation.

Let me take this opportunity to congratulate the authors on their contribution to this growing area of surgery.

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Dear Editor:

The recent article by Cotton et al. documents in a sufficiently large series that short-term complications after endoscopic sphincterotomy (ES) are not increased in relatively young and healthy patients with small bile ducts, when sphincterotomy for stones is performed by an expert.<sup>1</sup> The paper gives further support to the view that the most important side-effects of the section of the sphincteric mechanism are not short-term, but medium and long-term complications.<sup>2</sup> As authors acknowledge, "several medium to long-term follow-up studies have shown that up to 24% of patients may develop further biliary problems after ES".<sup>1</sup> Cotton et al. outline that "these studies mainly involved earlier cohorts of elderly and high-risk patients suffering from recurrent or retained stones in dilated ducts".<sup>1</sup> It can also be stressed that a common drawback in postsphincterotomy follow-up studies is the low compliance of patients asked to undergo X-ray or other invasive procedures after a benign disease as gallstone disease and an "ambulatorial" procedure as ES. Concerns about whether a planned sphincterotomy was really safe and necessary are expressed with increased frequency.<sup>2-3</sup> In particular, a study from our laboratory, documented that in subjects with nonbrown gallstones at cholecystectomy, brown recurrent stones, *i.e.*, a new disease, were found in 11% of patients who underwent surgical sphincterotomy after a mean follow-up of 6 years (range, 3 to 28 years) and in 9% of patients who underwent endoscopic sphincterotomy (mean follow-up 4.3 years, range, 3 to 10 years).<sup>4</sup> Fifty percent of these stones were detected within the first 5 years, whereas the remaining 50% became symptomatic up to 27 years after sphincterotomy. The impairment of the sphincter mechanism is a basic factor or at least a co-factor in the pathogenesis of brown stones.<sup>4</sup> These stones are typical "infectious" stones, the occurrence of which is facilitated by the type of bacteria, old age, grading of associated stricture and bile stasis, etc.<sup>5-7</sup> If the duodenum is sterile, as in young healthy patients, an impaired sphincteric function due to sphincterotomy does not determine the formation of brown stones. Therefore, incidence of brown stones will be very low in young patients, even if they have been followed-up for decades after sphincterotomy and significantly higher if a given series includes a considerable proportion of old patients. This is an important point that must be stressed even in young patients with normal bile ducts. These patients will never develop brown stones, if the sphincteric mechanism is not impaired or their duodenum never harbours *E. coli* (which is the more lithogenic bacterial strain). However, when in these patients or at least in some of them, contamination of the duodenum content by *E. coli* occurs with increasing age, an increased incidence of brown stones is expected because of the previous ES.

Accordingly, the evaluation of the long-term side-effects of ES will be affected not only by technical factors, but also by the total number of patients older 60 or younger 50, and the types of bacteria colonizing the duodenum in the series of matched patients. A correct evaluation of the long-term side-effects of ES concerning recurrent brown stones cannot be performed on the basis of questionnaires, or physical and laboratory examination, or ultrasounds. In fact: (i) common duct stones can be asymptomatic for