

## Leading article

# Surgery for uncomplicated gastrooesophageal reflux

Gastrooesophageal reflux is a common problem, yet surgical treatment for this condition is relatively rare. Simple changes to life style and medical therapy will control symptoms in most patients with reflux. Although the pathogenesis of the disease is multifactorial, the basic physiological abnormality resulting in gastrooesophageal reflux is failure of the antireflux barrier of the distal oesophagus. Antacids, H<sub>2</sub> receptor antagonists and proton pump inhibitors will alter the pH and volume of gastric refluxate and may result in healing of oesophagitis. Drugs affecting the lower oesophageal sphincter tone and gastric emptying may achieve additional benefit. Gastrooesophageal reflux is, however, a chronic or recurrent disorder frequently requiring prolonged treatment. In one study of patients with severe gastrooesophageal reflux 82% developed recurrent symptoms within six months of stopping omeprazole treatment.<sup>1</sup> No medical therapy will permanently abolish the physical failure of the antireflux mechanism. What then is the place of surgery?

Gastroenterologists can be excused for their reluctance to refer patients for antireflux surgery, perceiving the results to be poor;<sup>2</sup> the numeracy of eponymous operations and modifications<sup>3</sup> testifies to uncertainty. Analysis of the surgical literature reinforces physicians' concern: studies report results after a variety of different types of antireflux surgery,<sup>4,5</sup> a variety of technical modifications to one operation,<sup>6</sup> success rates of between 87% and 91% with incomplete follow up<sup>6,7</sup> and antireflux surgery linked to various additional procedures such as pyloromyotomy and vagotomy.<sup>8</sup>

Excellent results after surgery can, however, be obtained. Over a 10 year period Bancewicz (personal correspondence)<sup>9</sup> has carried out 240 antireflux procedures (floppy Nissen fundoplication) with 0.8% mortality (both deaths occurred early in the series as a consequence of aspiration during induction) and a 1.6% splenectomy rate. After a median follow up of 53 (1-127) months Visick gradings of 1 and 2 were recorded postoperatively in 87% and 3 and 4 in 13% of patients (the poor results were mainly caused by recurrent reflux after disruption of the fundal wrap). Postoperatively, 75% of patients underwent endoscopy and 59% both endoscopy and oesophageal pH monitoring. Fourteen patients had abnormal pH tests postoperatively and in eight, endoscopic oesophagitis was also present (disruption of the wrap being confirmed in six at reoperation). Thus, the worst outcome, judged by objective measurements, was failure of the operation in 14 of 142 (10%) patients. Shirazi *et al*<sup>10</sup> followed 150 patients over a 10 year period after short, floppy fundoplications and reported a 4.6% incidence of recurrent reflux symptoms while Polk<sup>11</sup> has reported a 4% failure rate after a median follow up of 3.8 years after fundoplication.

For those who treat patients with gastrooesophageal reflux disease, several issues remain unresolved. Whom to refer for surgery? What operation is needed? What investigations should be undertaken preoperatively? What complications might be expected and what follow up should there be?

The principal indications for antireflux surgery are persistent symptoms despite adequate medical treatment (there is a 10% failure rate after 12 months continuous omeprazole therapy)<sup>12</sup>; regurgitation, especially if associated with recurrent respiratory complications;<sup>13,14</sup> and symptoms in young adults. The latter group, in particular, should not

be denied operative treatment since successful surgery is preferable to a lifetime of medical therapy.

What type of surgery? Transthoracic surgery is recommended for short, obese patients with narrow subcostal angles, for those with oesophageal shortening secondary to perioesophagitis and for those with irreducible hernia. Most patients will, however, be suitable for an abdominal operation, the most popular current procedure is a 'floppy' Nissen fundoplication<sup>15</sup> or an alternative form of fundal wrap either complete or partial. Antireflux surgery aims to increase the length of the intraabdominal oesophagus; to create an antireflux barrier by wrapping the gastric fundus around the intraabdominal oesophagus; to approximate, without causing oesophageal obstruction, the crural arch to prevent the repair herniating into the thorax and to maintain normal oesophageal emptying. Meticulous attention to surgical detail is needed. The oesophagus requires gentle mobilisation with minimal trauma to the vagi<sup>7</sup> in order to avoid complications caused by inadvertent vagal nerve damage.<sup>5,8,16</sup> Adequate mobilisation of the gastric fundus is made by division of the short gastric vessels<sup>6</sup> and a fundal wrap of 1-2 cm length is constructed around an intraoesophageal bougie of 50 FG minimum diameter.<sup>15</sup> The tightness and length of the wrap are critical: too tight and too long a wrap will result in complete abolition of reflux symptoms at the expense of an unacceptable incidence of permanent postoperative dysphagia and gas bloat syndrome: too loose a wrap will result in failure to control reflux symptoms.

The use of the silicone prosthetic Angelchik collar remains controversial.<sup>17</sup> Initial use was complicated by reports of migration of the implant, erosion into the gastrointestinal tract and postoperative dysphagia necessitating subsequent removal.<sup>18</sup> Design modification has reduced the rate of migration<sup>18</sup> and a survey of surgeons in the UK<sup>19</sup> who had implanted a total of 1013 devices reported severe postoperative dysphagia in 66, erosion in nine and migration in seven patients. Persistent postoperative dysphagia necessitated removal of prostheses in 5.1%. The incidence of dysphagia increases with length of follow up. Dysphagia preoperatively is a contraindication to implantation of the prosthesis.<sup>20</sup> Trials with short term follow up, comparing fundoplication with Angelchik, have shown that the latter is a quicker operation with a shorter inpatient stay and with control of reflux broadly equivalent to that after fundoplication.<sup>21-23</sup> Endoscopic oesophagitis may, however, persist to a greater degree after use of the Angelchick collar compared with fundoplication.<sup>22</sup> One randomised trial comparing Nissen fundoplication with Angelchick prosthesis<sup>24</sup> has been abandoned prematurely because of a 20% rate of dysphagia following the latter procedure, despite initial reported success with the prosthesis.<sup>23</sup> Use of the Angelchik collar cannot be recommended for routine use in uncomplicated disease.

Preoperative investigations should include fibre optic endoscopy to assess inflammatory oesophageal changes, oesophageal shortening and to exclude neoplastic lesions in patients with dysphagia. If endoscopic oesophagitis is present, and the severity of symptoms warrant surgery, preoperative pH monitoring will not affect the proposed management. The postural pattern of reflux, thought to be important in selection for surgery,<sup>25,26</sup> does not seem to influence outcome. In a recent series of 126 patients,

preoperative pH monitoring showed upright reflux alone in 43 patients of whom 37 (86.1%) were graded Visick 1 and 2 post-operatively.<sup>9</sup> pH monitoring should be undertaken in patients with atypical symptoms or no endoscopic oesophagitis.

Oesophageal manometry is an unpleasant and time consuming investigation, but is recommended preoperatively to identify patients with oesophageal motility disorders in whom antireflux surgery might precipitate postoperative dysphagia.<sup>26,27</sup> Bancewicz's group<sup>9</sup> carefully studied oesophageal motility and sphincter function preoperatively in 126 consecutive patients undergoing floppy Nissen fundoplication. Motility disorders were recorded in 14 and 'competent' sphincters in 114 patients: 10 (71%) and 94 (83%) patients respectively were graded as Visick 1 and 2 postoperatively. Because gastrooesophageal reflux itself may provoke oesophageal motility disorders, preoperative manometry might be reserved for those patients with symptoms of dysphagia in whom organic obstruction is absent.

Barium studies, often neglected, are particularly useful in defining anatomical abnormalities in patients with short oesophagus and fixed hernia.

What are the complications of fundoplication and what follow up is recommended? Hospital mortality should be under 1% and close cooperation with anaesthetic colleagues is necessary to avoid aspiration at induction of anaesthesia. Splenectomy rates of between 1 and 8.5% have been reported after fundoplication:<sup>6,9-11,22</sup> the incidence of this complication can be reduced by careful surgery. Dysphagia and inability to belch or vomit with associated abdominal discomfort (gas bloat syndrome)<sup>28</sup> are troublesome complications of fundoplication. The incidence of both is more common after the classical Nissen fundoplication. De Meester and colleagues<sup>6</sup> reduced both complications after construction of the floppy fundoplication. Transient and early postoperative dysphagia occurs in up to one third of patients, but persists in 3% or less.<sup>6,10,22</sup> The unpleasant symptoms of gas bloat are a consequence of the tightness and technique of the fundoplication; after floppy fundoplication this complication occurs in 4-11%,<sup>6,10,11</sup> although in one series<sup>22</sup> the rate was 29%.

Failure of the floppy fundoplication to control reflux symptoms occurs in 4-9% of patients.<sup>10,11,22,29</sup> One series, however,<sup>23</sup> has reported a failure rate of six of 28 patients (22%) - endoscopic oesophagitis was present in five of the six patients two years postoperatively. The latter results emphasise the variability in surgical technique and may have occurred because of construction of too loose a wrap. Failure is predominantly the result of disruption of the wrap occurring within the first postoperative year.<sup>29</sup> This technical complication can be diagnosed by endoscopy or barium examination and may necessitate reoperation.<sup>29,30</sup> Ideally, follow up should be by an independent assessor, or by means of a detailed proforma and by objective data. Postoperative endoscopic examination is valuable to assess regression of endoscopic oesophagitis<sup>31</sup> and maintenance of the wrap. Follow up should be undertaken for at least five years.

Recent medical advances have overshadowed improvements in the results of reflux surgery. Omeprazole is highly effective in the short term management of reflux oesophagitis and the recent approval of this drug for use in maintenance therapy is most welcome. In patients with severe disease, however, relapse is almost inevitable on stopping therapy<sup>1</sup> and has been reported on reducing from 40 mg to 20 mg daily in 24% of patients with disease previously refractory to H<sub>2</sub> receptor blockers.<sup>12</sup>

Skilful surgery, carried out on carefully selected patients, provides the opportunity for permanent relief of the symptoms of reflux. Surgeons who undertake this surgery need to agree on standardised operative methods and objective criteria to define success, to audit results openly and to agree a classification of anatomical, pathological, and endoscopic

features of the disease complex to enable adequate comparison of results.<sup>32,33</sup> It may now be an appropriate time to consider a trial comparing omeprazole with floppy Nissen fundoplication in order to assess the place of these two treatments in the long term management of gastrooesophageal reflux, especially in young adults with this disease.

T C B DEHN

Royal Berkshire Hospital,  
Reading, Berkshire RG1 5AN

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