Achalasia: Dilation, injection or surgery?

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Achalasia results from irreversible alterations of the esophageal myenteric plexus. The target of treatment in this setting is to reduce lower esophageal sphincter resistance to passage of the bolus. Definitive treatment of the disease requires pneumatic dilation or Heller myotomy. Although no controlled studies comparing modern endoscopic and surgical techniques are available, laparoscopic surgery is emerging as the initial intervention of choice.

Key Words: Achalasia; Botulinum toxin; Fundoplication; Lower esophageal sphincter; Myotomy; Pneumatic dilation

L’achalasie : dilatation, injection ou chirurgie ?

RÉSUMÉ : L’achalasie résulte de modifications irréversibles du plexus myentérique œsophagien. Dans ce contexte, le traitement a pour but de réduire la résistance du sphincter œsophagien inférieur au passage du bol alimentaire. Le traitement définitif de la maladie nécessite une dilatation pneumatique ou une cardiomyotomie extramuqueuse de Heller. Bien qu’il n’ existe aucune étude comparative portant sur les nouvelles techniques chirurgicales et endoscopiques, la chirurgie par laparoscopie émerge comme la première intervention d’éléction.

Principles of Therapy

Current treatment modalities for achalasia are palliative and aim at improving esophageal emptying by reducing lower esophageal sphincter resistance to passage of the bolus. This effect can be achieved endoscopically by means of either pneumatic dilation (8-10) or botulinum toxin injection (11-13), and surgically by extramucosal myotomy (14-16). No firm consensus has been reached yet regarding the choice of the initial treatment. Retrospective studies have shown better results with myotomy performed by an experienced surgeon (17), and in the only prospective randomized trial myotomy gave better long term results compared with pneumatic dilation (18). Uncontrolled studies show that both procedures have equal success rates if skilled operators are available.
available, and, therefore, the patient should be allowed to make his or her own decision (19). In the only controlled trial of botulinum toxin injection versus pneumatic dilation, both procedures were effective at one-year follow-up (13).

Two randomized, double-blind, placebo controlled trials have shown that chronic treatment with calcium-channel blockers, such as nifedipine or verapamil, does not significantly improve symptoms despite a marked decrease of lower esophageal sphincter pressure in up to 50% of the patients (20,21). This form of therapy may be considered for short term management in individuals with relatively mild symptoms or as a temporary measure when more invasive procedures are contraindicated.

DILATION

Rigiflex balloon dilation of the esophagus is effective in more than two-thirds of patients. In up to 50% of the cases additional dilations are required to maintain symptomatic remission (10); the risk of perforation is estimated to be 1% to 6% in expert hands (22). Twenty-four hour esophageal pH monitoring shows gastroesophageal reflux in approximately one-third of the patients after dilation (23).

The effectiveness of dilation does not appear to depend on balloon size, dilation pressure, rapidity of inflation, duration of inflation, number of inflations per session or use of premedication. Patients who do not significantly respond to the first two dilations are unlikely to benefit from subsequent sessions, which may increase the risk of perforation (24).

INJECTION

The results of a double-blind trial of intrasphincteric injection of botulinum toxin compared with placebo showed that 66% of patients remained in remission six months after treatment, and the mean duration of a favourable response was 1.3 years (11). After a median follow-up of 2.4 years, only one-third of the patients were still in remission despite multiple injections. The response rate among patients older than 75 years was 75%, while it was 27% among individuals younger than 50 years (12). The short term safety and effectiveness of the procedure have been confirmed in a French multicentre study (25).

Based on these early results it seems reasonable to consider the use of the toxin in the elderly patients and in those at risk for more invasive procedures (26). It remains to be clarified how long the effects of the injection will last and whether repeated injections will prove to be safe in the long term.

SURGERY

Extramucosal myotomy of the distal esophagus and cardia has been shown to achieve good symptomatic relief in about 95% of patients with idiopathic, previously untreated achalasia. When dissection of the cardia is minimal and an anterior antireflux procedure is added, gastroesophageal reflux is rare (16).

The advent of minimally invasive surgery in the management of benign esophageal disease, by lessening the surgical trauma to the chest and abdominal wall, has made surgery a more attractive option as a primary treatment (27-30). It has been shown that an extramucosal myotomy of the esophagus and cardia combined with a Dor fundoplication can be performed safely and effectively through laparoscopy, with clinical and functional results similar to that obtained with the open approach (31).

The operation is performed through a five-port access. Careful attention to technical details of the procedure is critical for a good surgical outcome. The incision of the lesser omentum is performed taking care to preserve the hepatic branch of the vagus nerve. Dissection is limited to the anterior surface of the esophagus and of the diaphragmatic crura to prevent postoperative reflux by preserving the anatomical relationships of the cardia.

The myotomy is started on the distal esophagus using an L-shaped hook until identification of the submucosal plane, and then continued with the Sugarbaker pericardiomyotomy scissors. Intraoperative endoscopy helps to identify the submucosal plan, to evaluate the length of the myotomy and to divide residual muscle fibres; additionally, it allows detection of possible mucosal tears that may be safely sutured laparoscopically. The incision is carried out for about 6 cm on the esophagus and 2 cm on the gastric side including the oblique fibres. An incomplete myotomy on the stomach represents the most common reason for a failed operation (32). The cardia is not mobilized except in patients with sigmoid esophagus; in such circumstances, it is preferable to reduce the redundancy in the abdomen and to close the crura posteriorly. The anterior fundic wall is then sutured to both the muscle edges of the myotomy and cranially to the crura. The addition of an anterior antireflux repair sutured to the muscle edges aids in preventing postoperative reflux and healing of the myotomy. After an uneventful Heller myotomy and Dor fundoplication, a gastrographin swallow study is performed on the first postoperative day. The patient is then allowed to drink and to have a soft diet, and is discharged the following day.

EFFECT OF PREVIOUS TREATMENT ON SURGICAL OUTCOME

Patients unsuccessfully treated by endoscopic dilation or intrasphincteric botulinum toxin injection are often referred for surgery. Transient tissue damage in the mucosa-submucosa layer has been documented by high resolution endoscopic ultrasonography (33), but it is unknown whether previous endoscopic treatment may cause histopathological changes leading to periesophageal inflammation, difficult identification of the circular or sling fibres, or difficult dissection of the submucosal plane. Recently, it has been found that patients who previously responded to botulinum toxin show a marked fibrotic reaction at the gastroesophageal junction leading to a higher rate of intraoperative mucosal tears and postoperative dysphagia (34,35).

The increase in technical difficulties encountered at operation after injection therapy can be offset by adequate surgeon’s experience; however, these preliminary observations suggest that injection of botulinum toxin should be reserved...
to patients who are not candidates for pneumatic dilation or laparoscopic Heller myotomy.

CONCLUSIONS

Pneumatic dilation and Heller myotomy are the two best established therapeutic options in achalasia. Which is the initial approach of choice is still matter of controversy. Although the efficacy of surgery is more predictable, in the absence of a large multicentre, controlled trial, it seems reasonable to state that when expertise in both procedures is available the patient should be clearly informed about the potential risks of each procedure and should make his or her own decision.

The impact of minimally invasive surgery in the treatment of achalasia has been almost as profound as in the treatment of cholelithiasis. The results of laparoscopic Heller myotomy combined with a partial fundoplication show equal efficacy and markedly reduced morbidity compared with the open surgical approach. It is for this reason that, in the near future, laparoscopy could emerge as the initial therapeutic approach of choice in achalasia.

REFERENCES
