

Laparotomic approach in “achalasia surgery”

Have still a role in minimally invasive laparoscopic surgery era?



Ann. Ital. Chir., 2013 84: 511-514
pii: S0003469X13019489

Carlo Pignatelli, Eva Lieto

Department of General and Specialistic Surgery, II Division of General and Hepato-Biliary Surgery, II University of Naples, Italy

Laparotomic approach in “achalasia surgery”. Have still a role in minimally invasive laparoscopic surgery era?

Laparotomy can be considered as an access route among options that any oesophagus surgeon has to include in his technical experience. It can therefore either be chosen when the right indication emerges or be suggested as first line-procedure by the surgeon when he is sure that it can guarantee the best possible outcomes. Outcome that, in the Author's experience, show the surgical procedure Heller's extramucosal myotomy with anterior hemifundoplication according to Dor a well documented procedure the safety and effectiveness of which has been upgraded over time through new technical devices. Their effectiveness being equal, both techniques are widely acceptable and opting for one approach or the other depends on the expertise of the single surgeon who has to consider all the possible advantages for his patients.

KEY WORDS: Achalasia, Open Heller-Dor

Esophageal achalasia ¹, a rare neurodegenerative disease causing a total dyscinesia of the organ ², can now benefit from numerous therapeutic approaches (pharmacological, endoscopic and surgical approaches) ³ the application of which depends on the patient's general condition as well as on the stage and seriousness of the disease.

Owing to the extreme rarity of the pathology (1 patient/100.000) ⁴, to date, only a few randomized clinical trials have been performed in order to determine which is the best available therapeutic option ⁵. The surgical option is undoubtedly capable of ensuring the best long-term outcomes ⁶ even though, since esophageal achalasia is a functional pathology whose cause cannot be removed by surgical procedure which can only cor-

rect its main symptom (dysphagia), a definitive cure remains unobtainable ⁷. If on the one hand different case studies show a success rate higher than 90%, on the other, it is also true that after undergoing the surgery, the symptoms related to the disease may always reappear in the patient operated on for achalasia, especially in cases of overeating or emotional stress. Furthermore, in chronic cases involving the dilation of the stomach (also known as sigmoid megaesophagus) the tortuosity of the organ usually causes its delayed emptying,⁸ injection of botulin toxin, pneumatic dilation, mechanic dilation) can be an alternative to surgery ^{9,10} when surgery cannot be performed due to the patient's explicit refusal, the presence of severe co-morbidities or even in elderly patients with post-surgical recurrence.

Since, to date, the therapy has not yet achieved the objective of a definitive cure, no gold standard can be envisaged in the surgical treatment for achalasia. Furthermore, it has to be highlighted that functional surgery of the oesophagus aims at treating a rare disease and it is therefore still a highly specialized area which requires specific skills, sufficient experience to determine the right ther-

Correspondence to: Prof. Carlo Pignatelli, Via F. Crispi 128, 80122 Napoli, Italy (e-mail: carlo.pignatelli@unina2.it)

apeutic indication, as well as adequate supporting technical instrumentation (manometry, pH-metry, electrical impedance analysis, endoscopy, etc). This kind of surgery has to be performed with the utmost accuracy and precision, as it may also lead to serious complications and, consequently, it cannot be performed without all the required experience and training.

In theory, the surgical procedure has been completely codified⁵. Regardless of the access site (either abdominal or thoracic) and the procedure technique (open, thoracoscopic or laparoscopic), the surgery aims to solve the problem of dysphagia by preventing gastro-oesophageal reflux. All the available techniques allow this goal to be achieved with replicable results and low morbidity rates. In most cases, oesophagus surgeons prefer the abdominal way of access not only because this facilitates the access to the esophagus portion where the lower esophageal sphincter (LES) lies, but also because the major schools of specialized surgery have already codified all the steps involved in this type of procedure.

The surgical procedure, Heller's extramucosal myotomy¹¹, consists of an anterior extramucosal myotomy, near the cardial oesophagus, extended to the Helvetius fibres of the gastric body. This procedure allows the LES to be reset, leading to the resolution of the dysphagic symptom associated with the opening defect of the sphincter during deglutition, due to weak or absent peristaltic waves¹². The reflux prevention is obtained by preparing a plastic (so-called fundoplication, as it utilizes a part of the gastric fundus) that creates a new area of high pressure near the cardia. The available options of this procedure are chosen according to the personal experience of each surgeon and the different surgical guidelines. Although a few surgeons perform a total fundoplication^{13,14} where the gastric fundus is wrapped all the way around the cardia to form a cuff, partial fundoplications¹⁵ are the most commonly practiced ones (using either the anterior or the posterior portion of the gastric fundus which are fixed to the contralateral diaphragmatic pillar). In fact, in a still "diseased" oesophagus with impaired peristaltic activity, partial fundoplications, besides preventing the reflux, do not obstruct the progression of the alimentary bolus, which may influence the persistence of a troublesome post-operative dysphagia. Over the years, further technical devices aiming at improving the outcomes have been developed by all surgical schools dealing with functional surgery of the oesophagus. Today, the laparoscopic way of access⁷ is becoming the most widespread procedure due to its indisputable advantages: a shorter hospital stay, milder post-operative pain, quicker recovery of intestinal functions and better cosmetic results. However, open surgery still features among the various available therapeutic options for the treatment of achalasia¹⁶. First of all, it acts as a "parachute" of laparoscopy. It is in fact well-known that in a fair number of cases, usually in inverse proportion to the surgeon's experience, the conversion

from the laparoscopic way of access turns out to be inevitable, mainly because of technical problems that interfere with safe completion of the surgery. These problems are associated with adhesion phenomena concerning either the supra-mesocolic compartment (previous surgery) with consequent alteration of the normal anatomical relations, or the cardial esophagus itself (previous attempts of perendoscopic dilatation) which cannot be sufficiently isolated from the surrounding structures. Obviously, it can be considered the treatment of choice in the case of re-interventions following previous failures and, considering that the two techniques require different manual skills necessary to section muscle fibers, it also shows a lower rate of complications related to the perforation of the mucosa during the myotomy⁷.

Thanks to the widespread use of efficacious available analgesics, post-operative pain control is not a contraindication to laparotomy surgery, and no significant differences have been reported between the two surgical procedures in terms of return to normal feeding and symptom control. Furthermore, it is worth considering that a certain number of patients explicitly refuse the laparoscopic way of access and inducing the pneumo-peritoneum would be inadvisable for patients with different co-morbidities (mainly bronchopulmonary pathologies). It goes without saying that, by virtue of new insights and technological progress, surgical techniques are constantly evolving and this is why I wanted to teach my students, who normally perform this surgery laparoscopically, how to perform the open technique that I personally suggest to my patients after explaining all its technical implications and advantages in detail.

The long years of experience acquired by Prof. Lanzara, my great teacher, and his surgical school has made extramucosal myotomy with antireflux plastic surgery a well documented⁸ procedure the safety and effectiveness of which has been upgraded over time through new technical devices:

- a short median laparotomy in the area beneath the xiphoid, using a Rochas auto-static retractor, allows the appropriate exposure of the cardial region of the oesophagus;
- the section of the left triangular ligament of the liver makes the operative field perfectly accessible and makes it easy to perform the incision of the peritoneal reflection as well as the preparation of the diaphragmatic pillars by blunt dissection with the isolation of the oesophagus;
- the wide release of the viscus from the diaphragmatic hiatus and the lax cellular tissue of the mediastinum allows the mobilization of the oesophagus and the exposure of the tract that has to be myotomized;
- myotomy is performed by dissecting the longitudinal and circular muscle fibers, exposing the mucosa, starting from the arcuate fibers of the stomach (collar of Helvetius) at the bottom and moving upwards until the dilated (suprasphincteral) portion of the oesophagus is reached;

- in order to verify the completeness of the myotomy
- which is essential to keep dysphagia under control – intraoperative manometry¹⁷⁻²⁰ is performed to make sure that the pressure of the LES is equal to zero;
- the intraoperative use of an endoscope⁸ placed within the cardia is not only a guide when searching for the LES but also allows for the monitoring of the integrity of the oesophageal mucosa, exposed after the myotomy, by performing hydropneumatic testing;
- the reconstruction of the His angle, through 4-5 stitches between the left edge of the myotomy and the gastric fundus, is already a first step towards the creation of a high pressure area which hampers the reflux;
- the confection of an antireflux wrap with anterior hemifundoplication according to Dor²¹: the anterior wall of the gastric fundus is shifted in front of the herniated oesophageal mucosa after the myotomy and attached to the right edge of the myotomy itself with 4-5 stitches placed about 1 cm apart. This is an excellent way to prevent the reflux without hampering the transit of the alimentary bolus
- the fixation of the lower edge of the wrap to the small gastric curve prevents any possible displacement of the fundoplication and so-called telescopic phenomenon⁸;
- using manometry allows pressure values of the wrap to be calibrated within the range of 20-25 mmHg, which is a very good compromise between reflux prevention and the absence of post-operative dysphagia;
- once haemostasis has been checked, the procedure does not include the use of drainage and the intradermal suture of the skin improves the cosmetic outcome of the scar. On the very first day after surgery the patient is allowed to drink and feed on liquid nourishment, he is then rapidly discharged three or four days after surgery.

The above illustrated technique, supported by the countless experiences of our school, provides excellent results also in terms of long-term follow-up: long myotomy acts as a protection from a new onset of dysphagia and the Dor wrap from GERD.

The qualitative outcome of the laparoscopically performed surgery needs an adequate learning curve in order to ensure overlapping results, not least because, as previously stated, being an extremely rare disease with different therapeutic options, achalasia does not account for a vast area of application of this procedure, which, on the contrary, has been the case for cholecystectomy where laparoscopic treatment can really be considered the gold standard.

From randomized clinical studies and the meta-analysis by Campos⁵, it can be inferred that the two different routes of access in the myotomy and antireflux wrap procedure for the treatment of achalasia mainly yield overlapping outcomes in terms of safety and symptom control. Complications depend on the learning curves and, as already pointed out, problems underlying a longer post-operative period after laparotomy surgery may be

overcome by a cautious use of analgesics and short laparotomies without drainage.

In conclusion, laparotomy can be considered as an access route among other options that any oesophagus surgeon has to include in his technical experience. It can therefore either be chosen when the right indication emerges or be suggested as first line-procedure by the surgeon when he is sure that it can guarantee the best possible outcomes. Their effectiveness being equal, both techniques are widely acceptable and opting for one approach or the other depends on the expertise of the single surgeon who has to consider all the possible advantages for his patients.

Riassunto

La miotomia extramucosa sec. Heller con plastica anti-reflusso sec. Dor con controllo monometrico ed endoscopico intraoperatorio, condotta per via laparotomica per la terapia chirurgica dell'acalasia, conserva a tutt'oggi, in era di chirurgia mininvasiva, una sua validità. Rappresenta, infatti, una alternativa alla laparoscopia, sia in caso di conversione dell'intervento, sia come opzione di prima scelta garantendo risultati sovrapponibili sia in termini di ospedalizzazione che di controllo dei sintomi.

Quindi deve essere utilizzata quando se ne ravvisi l'indicazione ma può essere ragionevolmente proposta in prima istanza da parte del chirurgo che, attraverso di essa, sia certo di offrire al paziente il miglior risultato possibile; vale a dire che, a parità di efficacia, l'accesso laparotomico e quello laparoscopico sono ugualmente accettabili e la loro esecuzione dipende dalla esperienza del singolo chirurgo in ordine ad un vantaggio per il paziente.

References

1. Hurst AF: *The treatment of achalasia of the cardia: so-called "cardiospasm"*. Lancet, 1927; i:618.
2. Lanzara A: *Moderno inquadramento nosologico dei disordini dell'attività motoria dell'esofago*. Chir Gastroenterol, 1985; 19:573.
3. Abir F, Modlin I, Kidd M, Bell R: *Surgical treatment of achalasia: Current status and controversies*. Dig Surg, 2004; 21:165.
4. Ruffato A, Mattioli S, Lugaresi ML et al.: *Long term results after Heller-Dor operation for oesophageal achalasia*. Eur J Cardiothorac Surg, 2006; 29:914.
5. Campos GM, Vittinghoff E, Rabl C, Takata M, Gadenstatter M, Lin F, Ciovia R: *Endoscopic and surgical treatments for achalasia. A systematic review and meta-analysis*. Ann Surg, 2009; 249:45.
6. Del Genio A, Di Martino N, Izzo G, Landolfi V, Nuzzo A, Zampiglio P: *Surgical therapy of esophageal achalasia*. Ann Ital Chir, 1990; 61:239.
7. Douart R, Gaudric M, Chaussade S, Couturier D, Houssin D, Dousset B: *Functional results after laparoscopic Heller myotomy for achalasia: A comparative study to open surgery*. Surgery, 2004; 136: 16.

8. Pignatelli C, Pezzullo A, Galizia G, Lieto E: *Acalasia esofagea: Esperienza di una Scuola*. Atti Soc It Chir, 1993;621.
9. Csendes A, Braghetto I, Henriquez A, Cortes C: *Late results of a prospective randomized study comparing forceful dilatation and oesophagomyotomy in patients with achalasia*. Gut, 1989; 30:299.
10. Vantrappen G, Janssens J: *To dilate or to operate? That is the question*. Gut, 1983; 24:101.
11. Heller E: *Extramucose cardioplastie beim chronischen Cardiospasmus mit Dilatation des Oesophagus*. Mitt Grengelb Med Chir, 1913; 2:141.
12. Pignatelli C, Pezzullo A, Galizia G, Lieto E, Canfora F, Piatto A: *Cardiasmiotomia extramucosa sec. Heller con plastica antireflusso sec. Dor per megaesofago cardioacalastico*. Arch Surg, 1992; 127:222.
13. Del Genio G, Rossetti G, Bruscianno L, et al.: *Laparoscopic Nissen-Rossetti fundoplication with routine use of intraoperative endoscopy and manometry: technical aspects of a standardized technique*. World J Surg, 2007; 31(5):1099.
14. Rossetti G, Bruscianno L, Amato G, et al.: *A total fundoplication is not an obstacle to esophageal emptying after Heller myotomy for achalasia: Results of a long-term follow up*. Ann Surg, 2005; 241(4): 614.
15. Balaji NS, Peters JH: *Minimally invasive surgery for esophageal motility disorders*. Surg Clin N Am, 2002; 82:763.
16. Ancona E, Anselmino M, Zaninotto G, et al.: *Esophageal achalasia: laparoscopic versus conventional open Heller-Dor operation*. Am J Surg, 1995; 170:265.
17. Lanzara A: *Manometria esofagea intraoperatoria. Dieci anni di esperienza personale*. Min Chir, 1983; 38:1673.
18. Pignatelli C: *Controllo manometrico intraoperatorio nel corso di interventi chirurgici sull'esofago per malattia funzionale*. Giorn It Chir, 1980; 36:119.
19. Del Genio A, Izzo G, Di Martino N, Maffettone V, Landolfi V, Martella A, Barbato D: *Intraoperative esophageal manometry: our experience*. Dis Esophagus, 1997; 10(4):253.
20. Del Genio A, Maffettone V, Gomez Sanz R, et al.: *Intraoperative esophageal manometry in the surgical treatment of achalasia*. Rev Esp Enferm Dig, 1991; 79(1):3.
21. Hunter JG, Trus TL, Branum GD, Waring JP: *Laparoscopic Heller myotomy and fundoplication for achalasia*. Ann Surg, 1997; 225:655.