

Minimal Access Surgery (Laparoscopic Cardiomyotomy) for Achalasia Cardia

Hemant Patil

Member of World Association of Laparoscopic Surgeons, Mumbai, Maharashtra, India

Abstract

Background: Primary motor disorder of esophagus is achalasia cardia which is progressive in nature and do not have any definitive cure. Esophageal cardiomyotomy is the palliative method of treatment which forms the backbone of the treatment line of management. Over a period of last few years *minimal access surgery* is gaining popularity as the primary modality of management for achalasia. We present our review study of laparoscopic cardiomyotomy and discuss the relevant issues.

Method: A retrospective analysis was carried out of various studies who presented the large series of patients who underwent *Minimal access cardiomyotomy (laparoscopic)* at their respected centers. All patient related factors, the surgical techniques, post-operative course and management including follow-up are discussed.

Results: Minimal access approach showed less postoperative pain, ileus, less requirement of intravenous nutrition ($P < 0.0001$) consequently hospital stay, interval resuming the normal routine activity were also shorter (5 to 15 for minimal access surgery group versus 10 to 20 days for the open heller cardiomyotomy group ($P < 0.0001$)).

Conclusion: Minimal access surgery for achalasia is becoming more and more popular over conventional open cardiomyotomy in view of its equal safety and efficacy with added advantage of less morbidity, mortality and better quality of life.

Keywords: Esophagus, achalasia cardia, minimal access surgery, laparoscopy, Heller's cardiomyotomy.

AIMS AND OBJECTIVES

The aim of this study was to compare the effectiveness and safety of minimal access cardiomyotomy and conventional Heller's cardiomyotomy in the treatment of esophageal achalasia cardia.

The following parameters were evaluated for both minimal access and open procedures:

1. Method of patient selection.
2. Operative techniques.
3. Operative time.
4. Intraoperative and postoperative complications.
5. Postoperative pain and amount of narcotics used.
6. Time until resumption of diet.
7. Postoperative morbidity.
8. Hospital stay.
9. Cost effectiveness and
10. Quality of life analyses.

MATERIAL AND METHODS

A literature search was performed using Pubmed, search engine Google, Springer link and Highwire press. The following search terms were used: minimal access cardiomyotomy, laparoscopic cardiomyotomy, esophageal achalasia cardia and Heller's cardiomyotomy. More than 500 citations found. Selected papers were screened for further references. Criteria for selection of literature were the number of cases (excluded if less than 20), method of analyses (statistical or nonstatistical), operative procedures (only universally accepted procedure were selected) and the institution where the study was done (specialized institution for minimal access surgery).

INTRODUCTION

Achalasia cardia is one of the most commonly diagnosed motor and functional disorder of the esophagus. Failure of relaxation of lower esophageal sphincter, poor body peristalsis and a high pressure zone at lower sphincter are the characteristic findings. Decreased number or absence of ganglionic cells in the Aurbach's plexus results in the major pathophysiological changes including uncoordinated peristalsis, esophageal stasis resulting into dilatation and elongation of the esophagus. Diagnosis can be done by Barium swallow, upper GI endoscopy with biopsy. Esophageal manometry and 24 hours pH study requires for decision of surgery.

CONTENT

He was Heller, who performed first esophagomyotomy in 1913. He described both anterior and posterior myotomy. In 1923 Zaaiger modified it by doing single anterior myotomy and proposed the same results. Laparoscopic era started with Pellegrini who performed the first minimal access surgery of cardiomyotomy by thoracoscopic approach in 1991. Since then various studies performed at various institutions to compare or to prove the efficacy of the minimal access surgery.

Hajdu Z et al³ in their studies 21 patients evaluated the results which states that laparoscopic approach leads to good functional results and seems effective and safe procedure in

the treatment of esophageal achalasia. A 3.3 years follow-up study by Yasser-Youssef, et al¹³ after laparoscopic Heller's myotomy proved that minimal access approach via laparoscopy offers an excellent long-term relief of the symptoms namely dysphagia and also stated that there was significant improvement in the quality of life and patient satisfaction.

Large single center study of 226 patients done by Palanivelu C et al¹⁴ suggested that average operative time for laparoscopic myotomy was 96 minutes. Mean postoperative hospital stay was 2.2 days. The overall morbidity was 4.4% and nil mortality was observed over mean follow-up 4.3 years. They concluded the study suggesting that minimal access surgery is a safe and effective treatment for achalasia cardia. 106 patients were studied by M Robert, et al¹⁵ proving that the morbidity rate with average follow-up of 55 months was very less. They stressed the importance of the minimal access cardiomyotomy which gives good functional results.

One of the oldest studies done by Ancona E et al¹ compared the open cardiomyotomy with laparoscopic cardiomyotomy. Laparoscopic approach took longer time than open procedure (mean 178 versus 125 minutes). No major morbidity or mortality was observed in any group. But when compared the postoperative pain, ileus and IV nutrition the minimal access technique was much superior ($P < 0.001$).

Minimal access approach through thoracoscopy and laparoscopy was also compared by Cade R² which also mentioned that minimal access approach are very safe. Laparoscopic Heller's myotomy has comparable success to open Heller's myotomy and causes less early detriment in the quality of life and should be the primary treatment in all fit patients was the conclusion of the study by Katillus M, Velanovich V⁴ 62 patients underwent minimal access esophagomyotomy in a study done by Luketich et al⁵ at their institute also proved that laparoscopic approach offers very good results. Abir et al⁶ in their review of current status and controversies of management for achalasia stated that laparoscopic Heller's myotomy is generally accepted as the procedure of choice for esophageal achalasia.

Another study done by Desai KM, Soper NJ⁷ from USA supported that the laparoscopic myotomy provides good symptomatic relief. If we considered the safety factor, minimal access approach is very safe in elderly as shown by Kilic A et al¹⁶ also in pregnancy, study by Palanivelu C et al.¹⁷ Minimal access approach is advancing day by day. Now even the cardiomyotomy can be performed with the help of Robot – study by Chaer RA et al⁸ and study by Undre S et al.⁹ Satisfactory clinicoradiological results were obtained by Tello E et al¹⁰ in their study of 20 initial cases. Laparoscopic approach had the advantage of reduced cardiopulmonary compromise, less pain, less morbidity and shorter hospital stay as per Wang QS et al.¹¹ Minimal access surgery has replaced other modality of treatment for achalasia quoted by Bonavina L.¹²

DISCUSSION

Minimal access cardiomyotomy (laparoscopic cardiomyotomy) has got a lot of attention around the world. Several controlled trials have been conducted, some are in favour of laparoscopy others not. The goal of this review was to ascertain that if minimal access cardiomyotomy is superior to conventional and if so, what are the benefits and how it could be instituted more widely. There is also diversity in the quality of randomized trials. The main variable in these trials are following parameters:

1. Number of patients in trial
2. Withdrawal of cases
3. Exclusion of cases
4. Blinding
5. Intention to treat analysis
6. Publication biases
7. Local practice variations
8. Prophylaxis, antibiotics used
9. Follow-up failure.

CONCLUSION

The advent and the success of minimal access surgery have changed the treatment algorithm of the esophageal achalasia. Minimal access cardiomyotomy for achalasia is becoming more and more popular over conventional open cardiomyotomy in view of its equal safety and efficacy with added advantage of less morbidity, mortality and better quality of life.

REFERENCES

1. Ancona E, et al. Esophageal achalasia: Laparoscopic versus conventional open Heller-Dor operation. *Am J Surg* 1995; 170(3):265-70.
2. Cade R. Heller's myotomy: Thoracoscopic or laparoscopic? *Dis Esophagus* 2000;13(4):279-81.
3. Hajdu Z, et al. Laparoscopic cardiomyotomy in the treatment of achalasia. *Magy Seb* 2000;53(2):43-47.
4. Katillus M, Velanovich V. Heller myotomy for achalasia: Quality of life comparison of laparoscopic and open approaches. *JLS* 2001;5(3):227-31.
5. Luketich JD, et al. Outcome after minimally invasive esophagomyotomy. *Ann Thorac Surg* 2001;72(6):1909-12; discussion 1912-13.
6. Abir F, et al. Surgical treatment of achalasia: Current status and controversies. *Dig Surg* 2004;21(3):165-76. Epub 2004 Jun 24.
7. Desai KM, Soper NJ. Laparoscopic management of idiopathic esophageal achalasia. *Rev Gastroenterol Mex* 2004 Aug; 69 Suppl 1:7-13.
8. Chaer RA, et al. Robotic assisted laparoscopic pediatric Heller's cardiomyotomy: Initial case report. *J Laparoendosc Adv Surg Tech A* 2004 Oct;14(5):270-73.
9. Undre S, et al. Robot assisted laparoscopic Heller cardiomyotomy: Preliminary UK results.

10. Tello E, et al. Laparoscopic Heller's myotomy for classic achalasia: Results of our initial series of 20 patients. *Surg Endosc* 2005;19(3):338-41. Epub 2005 Jan 10.
11. Wang QS, et al. Laparoscopic Heller-Dor operation for patients with achalasia.
12. Bonavina L. Minimally invasive surgery for esophageal achalasia. *World J gastroenterol* 2006;12(37):5921-25.
13. Yassar-Youssef, et al. Relief of Dysphagia after Laparoscopic Heller Myotomy Improves Long-term Quality of life *journal of Gastrointestinal Surgery* March 2007;11(9): 309-13.
14. Palanivelu C, et al. Minimally invasive management of achalasia cardia; results form single center study *JLS* 2007;11(3);350-57.
15. M Robert, et al. Results of Laparoscopic Heller's myotomy without anti-reflux procedure in achalasia. Monocentric prospective study of 106 cases. *Surgical Endoscopy* April 2008; 22(4):866-74.
16. Kilic A, et al. Minimally invasive myotomy for achalasia in the elderly. *Surg Endosc* 2008;22(4);862-65, Epub 2007 Nov 20.
17. Palanivelu C, et al. Laparoscopic Heller's cardiomyotomy for achalasia of the cardia in pregnant patient. *Ann Acad Med Singapore* 2008;37(5);442-43.