

Open Vs Laparoscopic Heller Myotomy in Management of Achalasia Cardia, Retrospective Analysis of 75 Cases

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ABSTRACT

Objective: To compare open transabdominal heller myotomy and Laparoscopic heller myotomy in terms of symptom control, safety and quality of life.

Methodology: Patients with a diagnosis of achalasia cardia who underwent open as well as laparoscopic Heller myotomy were included in the study. A record of all these patients, including age, sex, symptoms, diagnosis and details of surgery, postoperative results and follow-up, was made. Patients were divided into two groups and compared in terms of symptomatic control and quality of life.

Results Out of 75 patients, 33 were included in Group A (Open approach) and 42 in Group B (laparoscopic approach). The mean age of the patients was 33.82 + 5.37 years with age ranging from 25 to 47 years. Most common symptom was dysphagia which was present in 100% of patients followed by weight loss which occurred in 83.58% of patients. Mean operative time in Group A was 60.00 + 6.08 minutes, while in Group B it was 45.43 + 7.07 minutes (p=.000). Overall, 8 (12.30%) complications occurred in the study population, which was intraoperative mucosal injury. Over a follow-up period of 6 months, 30 (92.90%) in Group A were satisfied with the results, having no dysphagia or regurgitation, while in Group B, 39 (92.85%) had satisfactory results.

Conclusion: Laparoscopic Heller myotomy is a safe alternative approach used for the treatment of achalasia cardia as compared to the open approach in terms of symptomatic control and better quality of life.

Keywords: Achalasia Cardia, Fundoplication, Heller Myotomy, Motility disorder

Authors' Contribution:

^{1,2}Conception; Literature research; manuscript design and drafting; ^{3,4}Critical analysis and manuscript review; ^{5,6,7}Data analysis; Manuscript Editing.

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Introduction

Achalasia cardia is a primary disorder of the oesophageal motility. Its annual incidence is 0.5 to 1.2 cases in every 100,000 people.¹ It is characterized by the lack of peristaltic movement in the body of the oesophagus and the failure of the lower esophageal sphincter (LES) to relax properly.² The exact cause of this condition is not fully known,

but it is thought to result from a reduction or absence of inhibitory neurons and ganglia in the myenteric plexus of both the oesophageal body and the lower oesophageal sphincter.³ Patients usually experience symptoms such as trouble dysphagia, weight loss, chest discomfort, and occasionally heartburn or acid reflux

Diagnosis is typically made using an oesophagogram, upper gastrointestinal endoscopy, and high-resolution manometry, which is regarded as gold standard for confirming diagnosis of achalasia cardia.

The main aim of treatment is to disrupt the lower esophageal sphincter and reduce its pressure, allowing food to pass more easily through the esophagus by gravity.⁴ Treatment options vary from medical therapies to procedures like pneumatic dilation, botulinum toxin injections, per oral endoscopic myotomy, and surgical approaches such as Heller myotomy, which is currently regarded as the best treatment option.⁵ The first Heller myotomy was performed by Ernest Heller in 1913, and the traditional method involved a left thoracotomy. Over time, there has been a shift from open surgery towards minimally invasive techniques. As laparoscopic methods have become more common, laparoscopic Heller myotomy, especially when combined with an anti-reflux procedure, has gained popularity. Many studies have shown successful outcomes with this approach.⁶

This research outlines our experience with the surgical treatment of achalasia cardia via Heller myotomy, focusing on the transition from open to laparoscopic techniques and comparing the two in terms of symptom relief, complications, and impact on quality of life. We also aim to evaluate the effect of including an anti-reflux procedure, such as the Dorr procedure, on symptom improvement.

Methodology

This retrospective study included a total of 75 patients who underwent Heller myotomy over a period of 19 years from Jan 2006 to Dec 2024 at department of thoracic surgery of CMH Rawalpindi, Quetta, Lahore and Multan. Sample size was calculated using formula for estimation of a single population proportion, assuming 95% confidence interval and 80% study power. Based on published literature expected success rate of Heller myotomy

was taken as 90% with a margin error of 7% yielding minimum sample size of 71. To compensate for incomplete/missing records sample size was increased to 75 patients. A retrospective consecutive sampling technique was used where all patients with radiological diagnosis of achalasia cardia (bird beak appearance) and endoscopically negotiable lower esophageal sphincter with normal anatomy were included in the study whereas those with suspicion of carcinoma and who underwent procedures for achalasia cardia other than Heller myotomy were excluded from the study.

Patients were categorized retrospectively into Group A, consisting of those who had open abdominal Heller myotomy with fundoplication, and Group B, comprising those who underwent laparoscopic Heller myotomy with or without fundoplication. Patients in group B were further sub grouped into B1 and B2 based on whether they underwent fundoplication or not.

Data regarding age, sex, investigation performed, clinical presentation, stage of achalasia were recorded from the hospital record. Record was noted for surgical approach used and intra-operative details regarding duration of surgery, incidence of intraoperative mucosal injury, type of fundoplication was noted. Post-operative recovery, stay in hospital, improvement in symptoms and weight gain was noted as well. Patients were followed up for improvement of symptoms and recurrence over period of six months. Categorical variables were expressed in terms of frequency and percentages while quantitative data was expressed in terms of means and standard deviations. Quantitative variables were compared by using Mann-Whitney test. Chi Square test was used to compare qualitative variables. Statistical significance was $P < .05$. Data was analyzed using SPSS Version 20.0.

Ethical approval of the study was taken from the Combined Military Hospital, Rawalpindi (Sr No.520) on 01-02-2024.

Results

A total of 75 patients fulfilling the inclusion criteria were included in the study. Out of total 75 patients 33 were part of the group A (Open Trans abdominal Heller Myotomy) and 42 were in group B (Laparoscopic Heller myotomy). Out of all 36(48.00%) were males while 39(52.00%) were females. Mean age of the patients was 33.82 ± 5.37 years with age ranging from 25 to 47 years. Mean age in group A was 33.36 ± 5.57 years while in group B was 34.16 ± 5.26 years ($p = 0.528$). Most common symptom was dysphagia which was present in 100% of patients followed by weight loss which occurred in 83.58% of patients. Frequency of other symptoms is given in table I.

Table I: Frequency of Clinical Symptoms		
Clinical symptom	Group A(n=33)	Group B(n=42)
Dysphagia	33(100%)	42(100%)
Regurgitation of food	23(69.70%)	25 (59.52%)
Dull Chest pain	8(24.24%)	6 (14.28%)
Weight Loss	28(84.85%)	36(85.71%)
Foul breath	13(39.40%)	17 (40.48%)
Heart burn	22 (66.68%)	27(64.28%)
Respiratory symptoms	7 (21.20%)	11 (26.19%)

Table II: Comparison of Variables amongst Two groups		
Variables	Group A	Group B
Length of Hospital stay(days)	3.54 ± 0.57	1.84 ± 0.72
Pain	6 + 2(on VAS) Required iv analgesics. Perioperative local block	4 + 1 Local block Syp and tablets
Cosmetic	Not acceptable	Cosmetically acceptable
Length of incision	8 ± 3 cm	1 ± 0.5 cm
Cost	Less	More

For diagnostic purposes barium studies and upper GI endoscopy was performed in all patients, whereas CT scan chest with contrast was performed in 36(48.00%) patients when indicated. Due to Lack of availability manometric studies were performed in 22(29.33%) patients.

Patients included in Group A were those who underwent open transabdominal Heller myotomy with DOR fundoplication in all whereas those included in Group B underwent laparoscopic Heller Myotomy with Dor fundoplication in 16(38.09%) patients whereas 26(61.90%) had no anti reflux procedure. Mean operative time in Group A was 60.00 ± 6.08 minutes while in group B was 45.43 ± 7.07 minutes($p=.000$). Overall, 9(12.00%) complications occurred in the study population which was intraoperative mucosal injury. In group A 4(12.12%) cases of mucosal injury occurred while in group B as well 5 (11.90%) occurred($p=1.00$).

There was no operative mortality in the study population and no conversion to open procedure was done in group B. Comparison of few other variables amongst Group A and B are depicted in table II.

Over a follow up period of 6 months 30(92.90%) in Group A were satisfied with the results having no dysphagia or regurgitation while in group B 39(92.85) had satisfactory results. Unsatisfactory resolution of symptoms was seen in 3(9.09%) patients who underwent Open approach and in 3(7.14%) patients who had Laparoscopic Myotomy. Over follow up period of 6 months late recurrence occurred in 1 patient in group A which responded to sequential dilatation whereas one patient in group B underwent Redo laparoscopic Myotomy.

Discussion

There are various treatment options for achalasia cardia, including endoscopic techniques like Endoscopic pneumatic dilation and per oral endoscopic myotomy, as well as surgical interventions such as Heller myotomy, performed

using both open and laparoscopic methods.^{7,8} Nitrates, calcium channel blockers, and botulinum toxin injections are typically reserved for patients who are not optimal candidates for surgery due to higher surgical risks (9), as these methods often yield inconsistent, short-lasting results and have a high relapse rate.¹⁰

In this study, the occurrence of achalasia was slightly higher in females (52.30%), which aligns with findings from Gouda BP et al and Gaber et al while Carlsen et al reported a higher incidence in males.^{11,12,13} The average age of patients in this study is 33 years; in contrast, Gouda BP et al. reported average 49 years. Patients suffering from achalasia cardia can exhibit a wide array of symptoms, ranging from dysphagia to respiratory issues, which was consistent with the findings in this study and has also been noted in the existing literature.¹⁴

Heller Myotomy is recognized as the gold standard for treating achalasia cardia, and since the first laparoscopic myotomy was performed in 1991, numerous studies have confirmed the effectiveness of this approach reporting a success rate exceeding 90%, which was similarly observed in our study.^{15,16,17} Various studies comparing open and laparoscopic Heller myotomy have shown comparable success rates in symptom resolution during follow-up, with less impact on quality of life regarding pain, functional disability, and cosmetic outcomes a finding echoed in this study as well.¹⁸

Complications associated with Heller myotomy can include inadequate myotomy, leading to ongoing dysphagia, gastroesophageal reflux disease (GERD) due to the myotomy, inadvertent vagotomy, and mucosal injury, which are typically identifiable during surgery and can be sutured without long-term consequences.¹⁹ In our research, mucosal injuries were the primary intraoperative complication seen in both groups, occurring slightly more often in the open approach, highlighting the advantages of the laparoscopic method. Fortunately, there were no long-term repercussions from the injury during follow-ups. Additionally, the

open approach has a reported perioperative mortality of 1.2%, compared to zero for the laparoscopic approach; however, in this study, there were no intraoperative fatalities, regardless of the approach used.²⁰

Another point of discussion following Heller myotomy is whether to include fundoplication due to the possibility of gastroesophageal reflux symptoms after a satisfactory myotomy,²¹ regardless of the technique used. In our study, we decided not to perform an anti-reflux procedure in 62% of patients in group B, and there were no notable GERD symptoms during follow-up visits. There is a difference of opinion on the type of fundoplication, as Nissen fundoplication has been linked to a higher rate of postoperative dysphagia.²² Typically, either an anterior 'Dor' fundoplication or a posterior 'Toupet' fundoplication is performed. At our centre, we routinely conduct Dor fundoplication, as was the case in this study, arguing that it reinforces the myotomy. In contrast, Nihedan et al²³ preferred the Toupet fundoplication, claiming that the posterior Toupet is superior in keeping the myotomy separated, preventing re-approximation. The choice between Toupet or Dor fundoplication is largely based on personal preference and experience, with both techniques offering specific advantages.

In this research, patients were monitored for six months, and the overall satisfaction rate exceeded 90%, regardless of whether the approach was open or laparoscopic. Only one patient (3.03%) in group A (open Heller myotomy) experienced a recurrence, while one patient (2.38%) in group B (laparoscopic group) had unresolved symptoms and required a repeat laparoscopy. Capovilla et al reported a symptom relapse in 10% of patients on long term follow-up and need for redo surgery in minority of patients.^{24,25}

Conclusion

Laparoscopic Heller myotomy can be performed safely and yields similar control of symptoms as

open Transabdominal Heller myotomy, while also offering improved quality of life outcomes due to reduced pain, quicker recovery, shorter hospital stays, enhanced aesthetic results, and high levels of patient satisfaction. To mitigate postoperative GERD symptoms, it is essential to incorporate a partial fundoplication procedure with the Heller myotomy, which in our study was the DOR's anterior fundoplication.

Limitations: This study has few limitations being retrospective in nature and short-term post operative follow up of patients. Prospective studies with longer follow up duration can be conducted for providing more robust results. Moreover, due to lack of availability of manometric facility it was not done in all patients and reflux symptoms were also judged clinically without subjective measurement with the help of PH studies. Despite these limitations this is first study from Pakistan comparing open and laparoscopic approach for performing Heller Myotomy.

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