Quality of life after Heller-Dor's cardiomiotomy

Qualidade de vida após a cardiomiotomia à Heller–Dor

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A B S T R A C T

Objective: To evaluate the surgical outcomes of Heller's Cardiomyotomy with Dor fundoplication by laparoscopy (HDL) and to assess its impact on patients' quality of life and on esophageal manometry data. **Methods:** 60 patients with esophageal achalasia, operated on between 2001 and 2007, were studied retrospectively. Before surgery, the demographics and the diagnostic test results were recorded. The patients submitted a dysphagia score for quality of life before and after surgery, and lower esophageal sphincter pressure (PLES) was measured. We also studied the difference produced in quality of life **Results:** 37 women and 23 men were followed. Mean age was 41.08 (12–87). There was no mortality and no conversions. The mean time of diet resumption was 1.6 day. The outcome was considered excellent in 80% of the series and intermediate in 20% of the series. The mean dysphagia score before surgery was 9.03 points, and after surgery, 1.7 point (maximum of 10 points), p=0.0001. The mean score decrease between pre- and postoperative scores was 7.33 points (87.17%). The mean PLES before surgery was 32.41 mmHg, and 12.7 mmHg after. **Conclusion:** HDL is a safe procedure and changed significantly the subjective quality of life scores, as well as the objective PLES means.

Key words: Esophageal achalasia. Quality of life. Laparoscopy. Fundoplication.

INTRODUCTION

Esophageal achalasia is an uncommon disease, with an incidence between 0.03 to 1 per 100,000 individuals[1]. It has no predilection for age or sex. This condition is the most frequently diagnosed esophageal motility disorder[2]. Depending on its etiology, it can be classified as idiopathic, chagasic, pseudoachalasia or associated with syndromic diseases. Infection by *Tripanossoma cruzi* in the South American countries, especially Brazil, has an important impact and we know that around 5% of the patients affected by Chagas' disease will develop achalasia[3].

In esophageal achalasia, the lower esophagel sphincter (LES) is hypertensive and the propulsion of the esophagus content is impaired by aperistalsis or uncoordinated peristaltic movements. Histologically, what occurs is the destruction or a decrease in the number of ganglion cells in the myenteric plexus[4-10].The affection is insidious and the main symptom is dysfagia (Df). Patients are emaciated and have poor quality of life, and leaves them unable to pursue their work activities. Treatment can be pharmacological, endoscopic or surgical. Among the surgical procedures performed, it is worth mentioning the Serra Dória and the Thal-Hatafuku techniques, which have been widely used in Brazil over the last 50 years, and esophagectomy for the very advanced cases [11-13].The surgical myotomy at the esophagogastric junction with or without an antireflux repair[3,14-20] is the most relevant procedure. Over the past 15 years, it has been performed through laparoscopy and considered to be the treatment with the best long-term outcome.

The purpose of the present study was to evauate the early and late outcomes of the surgical treatment of esophagus achalasia in patients submitted to Heller esophagocardiomyotomy associated with Dor partial fundoplication (HDL), based on the results of esophageal manometry (EMN) carried out pre- and postoperatively and on the review of questionnaires and quality of life scores returned by the operated patients.

METHODS

The retrospective study included 60 patients with achalasia who underwent Heller esophagocardiomyotomy plus Dor partial fundoplication by laparoscopy, or Laparoscopic Heller-Dor (LHD), in the period from January 2001 through September 2007. Fifty-four of those patients came from the General Surgery

Study conducted at the Hospital Universitário Clementino Fraga Filho of the UFRJ; Graduate Program in General Surgery of the Department of Surgery, School of Medicine of the UFRJ.

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outpatient clinic at the Hospital Universitário Clementino Fraga Filho (HUCFF), and six came from the Sorocaba Medical Center, Rio de Janeiro.

An evaluation protocol was used to record the following data: clinical history, specific tests, early and late pre- and postoperative assessment, quality-of-life questionnaires and a dysphagia score.

In the late postoperative period, already at the clinic, we recorded whether or not dysphagia persisted, as well as weight gain, postoperative morbidity and the need for complementary treatment. Esophageal manometry was conducted between the first and third postoperative month.

Quality of life evaluation

Two questionnaires were used to assess the patients' pre- and postoperative quality of life. The first questionnaire[21,22] was applied, evaluating the association of frequency and severity of dysphagia (Df) through a scale of points (pts).

Frequency of dysphagia: 0 pts = never; 1 pt = less than 1 day per week; 2 pts = 1 day per week; 3 pts= two to three days per week; 4 pts= four to six days per week, and 5 pts= daily.

Severity of dysphagia: 0 pts= none; 1 pt= very mild; 2 pts= mild; 3 pts= moderate; 4 pts= moderately severe, and 5 pts= severe (table1).

The score added up to 10 points and was estimated before and after surgery. Questionnaires were completed through the review of the medical records and interviews with the patients at the clinic or by phone.

The second questionnaire was conducted through direct interviews with the patients, who were asked to grade, in their own words, the intensity of dysphagia relief from 0 to 100.

Indication for surgery

Surgery was indicated for patients with achalasia who presented with megaesophagus grades I, II or III, and selectively in four cases of megaesophagus grade IV (Rezende classification[23]). Patients who had undergone previous surgery at the esophagogastric junction were excluded from the study.

Surgical technique

Heller esophagocardiomyotomy was performed by sectioning both the longitudinal and the circular muscle layers at the esophagogastric junction 6 cm on the distal esophagus and 2 cm on the gastric cardia, leaving the organ submucosa intact (Figure 1). The procedure always ended with the addition of a Dor partial fundoplication covering the submucosa at the site of the esophagocardiomyotomy[24].

Student's *t*-test was used in the comparison of means for quantitative variables, while the Wilcoxon rank sum test was used for medians. As for the qualitative variables, the chi-square and Fisher's exact test were applied. A value of *p* lower than 0.05 was considered to be statistically significant.

Failure of surgical treatment

Patients who, after 90 postoperative days, presented with persistent dysphagia and a score lower or equal to five were considered to be surgical treatment failure, as were those who needed complementary treatment, such as pneumatic cardia dilation (PCD), botulinum toxin injection or a redo myotomy.

RESULTS

Preoperative period

Of the 60 patients, 53 had negative serology for Chagas' disease (88.6%), five (8.3%) were positive. It was not possible to identify the serological status in two (3%) cases.

Dysphagia was the prevailing symptom: it occurred in 100% of individuals with varying severity. Dysphagia for solids occurred in 96% of cases, for puréed foods in 64%, and liquids in 20% of cases. Mean duration of dysphagia was 42.6 months (4–276 months). Regurgitation occurred in 33.3% of cases.

Weight loss was reported by 78.18 % of patients, with a mean weight loss of 10.3 kg (2–30 kg). Clinical malnutrition was reported for 8.5 % of individuals. Mean albumin level was 4.08 mg/dl and total protein, 7.6 mg/dl.

A preoperative mean of 4.7 points was found for frequency of dysphagia, and the mean for severity was

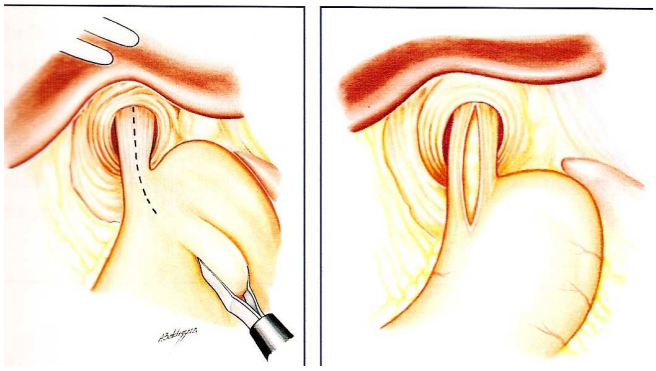

Figure 1 - *Myotomy area, 2 cm on the stomach and 6 cm on the esophagus.*

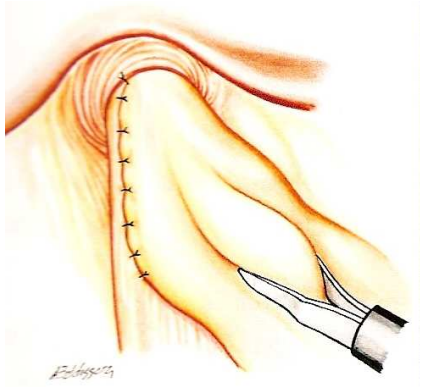

Figure 2 - *Final aspect of the anterior Dor fundoplication.*

Table 1 - Dysphagia Score (3,4).

Dysphagia Score				
Frequency of dysphagia 0-5 pts	**pts**	**Severity of dysphagia 0-5 pts**	**Pts**	**Total**
Never	0	None	0	
Less than 1 day weekly	1	Very mild	1	
1 day weekly	2	Mild	2	
2 a 3 days weekly	3	Moderate	3	
4 a 6 days weekly	4	Moderately severe	4	
Daily	5	Severe	5	10 pts

4.1 points. The overall mean of scores in the preoperative period was 9.03 points (maximum of 10 points).

Twenty-one patients underwent preoperative PCD, which accounts for 35.5% of the series. The total of PCDs was 35, with a mean of 1.66 dilation/patient (1–4 sessions).

Individuals were classified as follows: grade I, 16.07% of the individuals;; grade II: 57.1%; grade III: 21.4%, and grade IV: 3.57%. Upper gastrointestinal endoscopy showed normal esophagus mucosa in 62% of cases, esophagitis in 13.95% and peptic disease (gastric or duodenal) in 27.9 % of cases. The mean preoperative rest pressure of LES (PLES) of all the study cohort was 32.1 mmHg (4.7–60.6 mmHg).

Perioperative period

The surgical procedure was HDL in 100% of the cases. No conversions occurred . Mean operative time was 147 min (90–260 min). The mean extension of the esophagocardiomyotomy was 6 cm on the esophagus and 2 cm onto the stomach. In four patients, there occurred a punctate perforation on the distal esophagus mucosa, identified during surgery. The rhaphy of the mucosa was performed, and it was covered with gastric serosa in the Dor procedure. In 14 patients (23.3%), the short vessels between the stomach and spleen were ligated.

Postoperative period

Diet was initiated on the first postoperative day (POD) in 74% of cases. Hospital discharge took place on POD 2 for 61.8% of the patients. Mean time for diet start was 1.6 day and the mean time for postoperative discharge was 4.45 days.

Out of the 60 patients operated on, 48 were considered to be surgical treatment success, which represents 80 % of the series. Twelve patients with intermediate outcomes were classified as surgical treatment failure, which accounted for 20 % of the series.

The postoperative dysphagia score was applied, and the mean for frequency of dysphagia was 0.9 point, while the mean for severity of dysphagia was 0.8 point for an overall mean of 1.7 point. The mean overall decrease in the dysphagia score between the pre- and postoperative period was 7.33 points, which represents a 81.17% decrease. The value of *p* was 0.0001 (Figure 3).

The evaluation of quality of life (QL) improvement was carried out by the patients, who, in their own words, revealed a mean improvement of 84.09%. The percentage of patients who indicated an improvement >90% in QL was 76%, while 10.2 % of them showed an improvement between 80% and 90% in QL, and 10% of the cases had an improvement <80 % in QL.

Postoperative PLES assessment showed an overall mean of 12.7 mmHg. Lower esophageal sphincter pressure was found to be <15 mmHg in 55% of the patients, 15 to 20 mmHg in 42% of cases, 20 to 30 mmHg in 7.8 % of the individuals and in no instance was it > 30 mmHg (figure 4).

Mean follow-up was 15.89 months (2–60 months). Postoperative symptoms were reported by 31.5% of the patients. Among those symptoms are dysphagia,

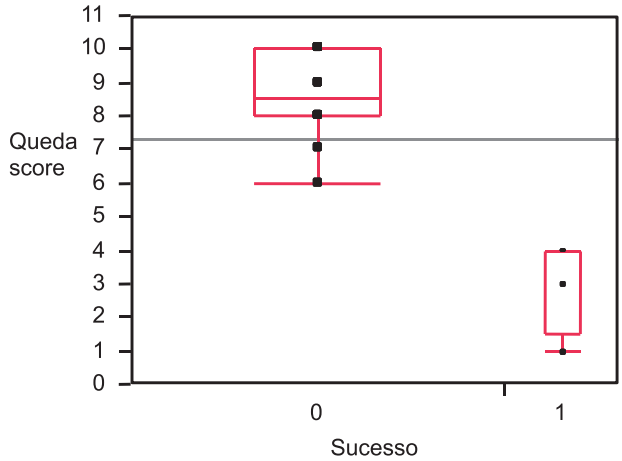

Figure 3 - *Plotting of the decrease in the dysphagia score Pre- and Postoperative x Success (0) and failure (1).* p *=0.0001.*

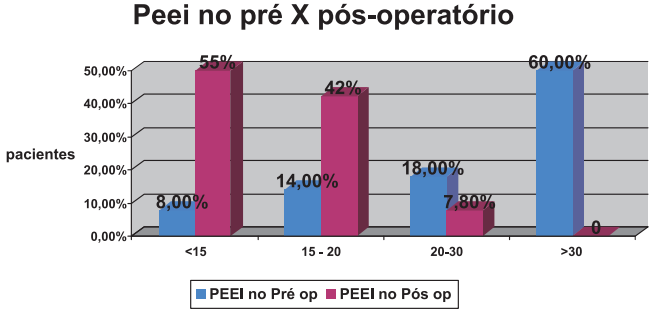

Figure 4 - *Comparison of preoperative and postoperative PLES.*

choking, regurgitation, hiccups, pyrosis and nausea. The most frequent symptom was dysphagia, present to some degree in 25% of cases. Pneumatic cardia dilation was performed in five patients postoperatively, representing 8.3% of the series. Two patients exhibited long-term morbidity – incisional hernias, representing 3.3% of cases (Table 2).

DISCUSSION

The study undertaken was retrospective with prospective data collection. The data were obtained from the review of medical records and direct interviews with the patients. Surgical outcome was excellent in 80% of the patients, and 20 % of them were classified as treatment failure. If the PLES outcome, as given by the postoperative EMN, is analyzed separately, considering that the surgical end point was the return of the PLES to a near-normal value, we find that only 7.8 % of the cases continued to present PLES above 20 mmHg. Most individuals (92.2%) exhibited a drop in PLES to near-normal values. We found studies in the literature with excellent and good outcomes between 78% and 93%[21-23,25]. However, we could not find in the literature a unified criterion to classify success and failure of the surgical procedure. Some authors use a decrease in PLES[26] as the criterion, while others use criteria based on symtoms listed in questionnaire schemes with a scale of points[21,22] similar to the one chosen for the present study. Some authors draw on reports of dysphagia relief as an improvement parameter[27,28]. There is yet another group who is not concerned about defining the adopted criterion precisely, and mention terms such as "relief of dysphagia" or resolution of the symptoms[29]. This lack of homogeneity is understood to be a consequence of the actual clinical difficulty, that is, identifying failure of treatment. This difficulty is even greater when it comes to patients who, after 90 postoperative days, still exhibit dysphagia with significant frequency and severity, but returned to their daily life and work activities and are gaining back weight. The fact is that those patients benefited from the operation, yet did not attain the ideal outcome[25]. On adopting this failure criterion based on a dysphagia questionnaire, the option favored an already published parameter with a higher clinical sensitivity[21,22,30,31]. However, this choice entailed having an increased number of cases classified as failures, which actually exhibited a partial improvement. In fact, none of the 12 patients classified as treatment failure cases required reoperation. They were managed with pneumatic dilation or a dietary change.

The criterion to indicate reoperation for the patients submitted to Heller esofagocardiomyotomy is not very clear in most studies. Few patients required reoperation in the available series; the great majority was treated by PCD or the botulinum toxin[21,22,27-30,32-34].

The dysphagia score applied was based on the frequency and severity of dysphagia, measured pre- and postoperatively. We found that the great majority of patients had a high preoperative score: 84.7% of the individuals were between 8 and 10 points. Postoperatively, that tendency was reversed. The mean overall score decrease was 7.33 points, a 81.17% decrease. We can conclude that the surgical treatment, Laparoscopic Heller-Dor, was capable of influencing the quality of life in a relevant way, radically changing the chief symptom, dysphagia[28,30].

In 12 patients, a decrease lower or equal to five points was observed in the dysphagia score. Those patients were counted as treatment failure cases. In that group, the

Table 2 - Surgical outcomes.

Overall outcomes	n	%	Min.	Cha	Days	Observation	
Laparoscopic Heller-Dor	60	100					
Conversion	0	0					
Mean operative time			147				
Hemotransfusion	1	1,6		03			*
ICU stay	3	5			08		*
Reoperation	3	5			08		*
Surgical complication	3	5					*
Cavity drain	4	6,6					*
Fistula	1	1,6				Fistula de ceco	**
Morbidity	2	3,3				Hérnia incisional	**
Mortality	0	0					
Mean follow-up						15,89 meses	
Success	48	80					
Failure	12	20					

** The three reoperated patients were the only ones in the series who were admitted to the ICU, used a drain in the abdominal cavity, and one patient developed a fistula.*

*** Patient number 10 in the series was reoperated on because of a right iliac artery injury by Veress needle, identified in the immediate postoperative. After emergency surgery, the patient developed five days later an enterocutaneous cecal fistula , which responded to non-surgical treatment.*

mean decrease in QL was 3.08 points with a percent reduction of only 30.6 %. In the success group, the mean postoperative score was 0.6 point with a mean decrease of 8.4 points (93.3%). The relation between the mean decrease in the success/failure scores yields $p<0.0001$, an understandable result, since the failure group did not achieve the desired improvement in dysphagia.

Cardiomyotomy is the main operative time of HDL. We believe, as do those authors who advocate an extended myotomy on the esophagus and onto the stomach [21,22.35], this technique is essential to enhance esophageal emptying. Oelschlager [35] published a series comparing the length of cardiomyotomies and found in those with extended myotomies a mean PLES of 9.5 mmHg versus 15.8 mmHg ns with shorter myotomies, and 17 % of those individuals with short myotomies presented with dysphagia recurrence versus only 3% in the series with extended cardiomyotomy. Some authors have made use of a perioperative gastrointestinal endoscopy in order to achieve a total myotomy in the regions of the cardia, and the same objective has guided the use of perioperative esophageal manometry [27,32,36].

The addition of an antireflux procedure, namely, the Dor fundoplication, aims to protect the esophagus from postoperative GERD. Covering the esophageal myotomy serves to protect the exposed mucosa and prevent scar fibrosis, as previously proposed by Pinotti[21]. The debate over whether or not to add fundoplication remains heated. Gupta[34], in his series, performed esophagocardiomyotomies without fundoplication and found no statistical difference in the incidence of reflux as measured by pH monitoring, comparing pre- and postoperative results. Richards [21] conducted a prospective, randomized, double-blind trial comparing Heller esophagocardiomyotomy alone with Heller plus the Dor procedure. He found results supporting the use of HDL.

All studies reviewed which aimed to evaluate HDL and its variants concluded that it a safe procedure, requiring short hospital stay, and providing a high sucess rate, including a significant impact on the chief symptom: dysphagia. Near-zero morbidity and mortality rates also recommend this surgery in the management of achalasia [17,21,22,27,28,30,32-34,37].

Heller-Dor cardiomyotomy proved effective in changing lower esophageal sphincter pressure, reversing the preoperative pattern, and showed a positive effect on the quality of life of the patients in the present study.

R E S U M O

***Objetivo**: Avaliar os resultados da cardiomiotomia de Heller associada à fundoplicatura de Dor por Laparoscopia (HDL) no tratamento cirúrgico da acalásia do esôfago, através de scoress de qualidade de vida e dados da esofagomanometria. **Métodos**: Foram estudados retrospectivamente 60 pacientes operados por acalásia do cárdia, de 2001 a 2007, sendo analisadas no pré-operatório as características desta população e os resultados das provas diagnósticas. Aplicamos um scores de disfagia e de qualidade de vida no pré e pós-operatório e realizamos o estudo do comportamento da pressão do esfíncter esofageano inferior (PLES) no pré e pós operatório de todos os pacientes. **Resultados**: Eram 37 do sexo feminino e 23 do masculino. A idade média foi 41,08 anos (12 a 87). Não houve mortalidade cirúrgica, nem conversões. Tempo médio de início da dieta foi de 1,6 dias. Considerado resultado excelente em 80% da série, resultados intermediários em 20%. A média do scores de disfagia no pré operatório foi de 9,03 points e a média de pós, foi de 1,7 points (máximo de 10 points), p=0,0001, sendo observada drop entre pré e pós-operatório de 7,33 points, 81,17%. A média da PLES no pré-operatório foi de 32,41 mmHg e no pós 12,7 mmHg. **Conclusão:** A cirurgia HDL é procedimento seguro de ser realizado e apresentou bons resultados, sendo capaz de modificar os scoress de qualidade de vida subjetivos, e os dados objetivos da PLES, de forma significativa.*

***Descritores**: Acalásia esofágica. Qualidade de vida. Laparoscopia. Fundoplicatura.*

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