Day surgery for achalasia cardia: Time for consensus?

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ABSTRACT

INTRODUCTION Laparoscopic Heller's myotomy (LHM) is the most effective therapy for achalasia of the oesophagus. Most case series of LHM report a length of hospital stay (LOS) >1 day. We present 14 years of experience of LHM to examine the safety and feasibility of LHM as a day case procedure.

METHODS We retrospectively examined patients undergoing elective LHM for achalasia at our institution between 2000 and 2014. Demographics, episode statistics, prior investigations and interventions were collated. Outcomes, including LOS, complications and re-interventions, were compared for the periods before and after a consensus decision at our institution in 2008 to perform LHM as a day case procedure.

RESULTS Sixty patients with a mean age of 41±13 years were included, of whom 58% were male. The median LOS for all patients was 1 day (interquartile range [IQR] 0–2.25). Overall, LHM was performed as a day case in 27 (45%) cases, at 2/26 (7.7%) in the first period versus 25/34 (73.5%) in the second ($p<0.01$). There were no significant differences in age, gender or previous interventions between day surgery and non-day surgery groups. One patient required subsequent unplanned surgery, while six (10%) needed endoscopic treatment of recurrent symptoms within 12 months.

CONCLUSIONS LHM can be performed safely as a day case procedure. Complication rates are low, with only a small proportion of patients requiring endoscopic treatment for symptom recurrence within 1 year.

KEYWORDS

Achalasia – Esophageal – Ambulatory Surgery – Surgery, day – Laparoscopy

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Achalasia is a rare benign motility disease of the oesophagus, with a prevalence of 6–8 per 100,000.^{1,2} It is characterised by impaired oesophageal body peristalsis, and the resulting failure of lower oesophageal sphincter relaxation causes regurgitation, dysphagia and weight loss, alongside a potentially increased risk of oesophageal carcinoma.³ Treatment includes medical and surgical therapies, but current trends are moving towards early surgical intervention with Laparoscopic Heller's cardiomyotomy (LHM).^{4,5} Advocates of this approach would reserve endoscopic dilatation for patients that are medically unfit for surgery.⁶ The literature, including a meta-analysis of randomised controlled trials of LHM versus endoscopic pneumatic dilatation, favours LHM as first-line therapy.^{7,8} Some endoscopic enthusiasts have suggested that incision-less peroral oesophageal myotomy compares favourably with LHM as the treatment of choice for achalasia.^{9,10} However, there is a lack of long-term evidence to support such conclusions.¹¹

It is argued that endoscopic treatment is a minimally invasive day case procedure, in contrast to surgical cardiomyotomy, which is an invasive, inpatient surgical procedure

under general anaesthesia. This belief has to be tempered by the increased risk of oesophageal perforation with endoscopic dilatation and the frequent need for repeat procedures.⁷ Moreover, the mean length of hospital stay (LOS) for LHM reported in previous studies is >1 day.^{12–15} Nevertheless, the safe and effective performance of LHM as a day case lends further credence to surgery as a first-line therapy for achalasia of the oesophagus.¹⁵

We present 14 years of results from our surgical programme to examine trends in the performance and outcomes of LHM before and after a consensus agreement at our institution to treat LHM as a day case procedure.

Methods

All consecutive patients who had undergone LHM between January 2000 and October 2014 were identified from hospital episode statistics at a single upper gastrointestinal and minimally invasive centre in the UK. Patients treated up to July 2007 were described in a previous publication from the same unit.¹⁵ Individual medical records were examined

to collect data on patient demographics (age, gender, ethnicity and location of residence) and episode statistics (LOS, name and grade of operating surgeon), as well as preoperative investigations, readmission and outpatient clinic follow-up.

All operations were performed by one of six consultant surgeons. A standardised technique was followed: the distal oesophagus was mobilised and the gastro-oesophageal junction clearly demonstrated; myotomy was made from at least 5–6 cm above the gastro-oesophageal junction, extending to at least 2 cm below; and the procedure was completed with fundoplication.

Before 2008, the hospital pathway for patients undergoing LHM (including anaesthetic technique, hospital stay and follow up) was decided on a case-by-case basis, with no established protocol. In 2008, a consensus agreement was made by the upper gastrointestinal consultants at our institution to treat LHM as a day case procedure. The protocol, including patient suitability criteria, anaesthetic technique, postoperative pain and nausea management and outpatient follow up, mimicked that in routine use for day case fundoplication, and is reported in detail in a prior publication from the same institution.¹⁶ Patients considered unsuitable for discharge by 6 pm on the day of surgery (eg due to pain, nausea or social circumstances) were admitted for overnight stay. On discharge, a standard analgesia package was prescribed, and the patients were telephoned the day after surgery to monitor their progress. Outpatient follow up was similarly standardised.

Outcomes

Patient outcome data used in this study included LOS and postoperative complications, comprising unplanned readmission within 30 days, unplanned surgery within 90 days, and further interventions within 12 months. Complications were classified using the Clavien-Dindo grade, based on the treatment required.^{17,18}

'Day surgery' was defined as patient discharge occurring on the same day as the surgical procedure (ie LOS=0 days), in line with the UK Department of Health¹⁹ and International Association for Ambulatory Surgery (IAAS).²⁰ Ethnicity was not independently defined, but instead taken directly from the computer records of patients who declared their ethnicity on admission. Distance lived from the hospital was calculated as the shortest calculated distance between the patient residential postcode and hospital postcode on Google Maps (<https://www.google.com/maps>).

Statistical analysis

Values were expressed as mean and standard deviation (SD) for normally distributed data, and as median and interquartile range (IQR) for non-normal data. Analyses included the Mann-Whitney U test for continuous non-normal data and the Student t-test for normally distributed continuous data. The periods before (2000–2007) and after (2008–2014) the establishment of the LHM day case procedure protocol at the NHS Trust were compared. Statistical significance was defined as $p < 0.01$.

Results

Sixty patients underwent elective laparoscopic Heller's myotomy (LHM) for achalasia between 2000 and 2014. Twenty-four of the patients, who were treated up to July 2007, were included in a previous publication.¹⁵ Patient age at the time of procedure was normally distributed, at a mean of 41 ± 13 years. Thirty five patients (58%) were male. Patient ethnicity was declared in 47 cases, with 34 describing themselves as 'British', 10 'Pakistani/Indian' and three 'Black/Caribbean'. Patients lived a median of 5 miles (IQR 3.75–13.2) from the hospital.

Preoperative assessment

Forty-four patients underwent preoperative endoscopy, of whom two (4.5%) had evidence of oesophagitis, and four (9%) evidence of hiatus hernia (all less than 5 cm in length). None had evidence of Barrett's oesophagus. Forty patients also underwent pre-operative barium swallow examination.

Manometry reports were available for 58 patients. Seven investigations were incomplete due to either patient intolerance or technical failure (ie inability to pass the catheter beyond the oesophagus). In patients who did not complete manometric assessment, endoscopic and contrast investigations were used for diagnosis. The mean distances of the proximal and distal positions of the lower oesophageal sphincter were 44.9 ± 3.57 cm and 48.1 ± 3.37 cm, respectively, at a mean length of 3.16 ± 0.80 cm. The mean pressure at the lower oesophageal sphincter was 25.5 ± 10.2 mmHg. All were reported as either non-relaxing or incompletely relaxing, with either weak or absent motility.

Previous interventions

Eleven (18.3%) patients had previously undergone endoscopic balloon dilatation to treat achalasia. All cases had recurrence of symptoms, and opted for definitive surgery. Two (3.3%) patients had also undergone prior botox therapy for the treatment of achalasia. None of the patients had undergone previous gastric or oesophageal surgery.

Length of stay

The median overall LOS for all patients was 1 (IQR 0–2.25) days. Twenty seven (45%) patients were discharged on the same day as admission (ie 'day case surgery'). There were no significant differences in median age, gender, distance from hospital, number of previous endoscopic or botox procedures, or declared ethnicity between the day case and non-day case patient groups (Table 1). The distribution of LOS is shown in Figure 1.

Twenty six patients were treated prior to the establishment of the LHM day case protocol (2000–2007), while 34 patients were treated afterwards (2008–2014). There were two (7.7%) day case procedures in the first period and 25 (73.5%) in the second ($p < 0.01$). There was a general trend towards reduction in LOS between the two periods (Table 2 and Figure 1).

Table 1 Patient characteristics in day case and non-day case patients

		Surgery		p-value
		Day case (n=27)	Non-day case (n=33)	
Median age (years)		40	41	0.772
Gender	Male	15 (56)	20 (61)	0.693
	Female	12 (44)	13 (39)	
Median distance from hospital (miles)		5.4	5	0.841
Previous endoscopic intervention		3 (11)	8 (24)	0.191
Previous botox therapy		1 (4)	1 (3)	0.885
Ethnicity	British	14 (52)	20 (61)	0.831
	Pakistani/Indian	5 (18)	5 (15)	
	Black/Caribbean	1 (4)	2 (6)	
	Not declared	7 (26)	6 (18)	
Year of surgery	2000	0	2	
	2001	0	3	
	2002	0	0	
	2003	0	6	
	2004	0	3	
	2005	0	4	
	2006	0	2	
	2007	2	4	
	2008	2	0	
	2009	3	2	
	2010	4	2	
	2011	3	1	
	2012	7	1	
	2013	4	2	
	2014	2	1	

All values n (%) unless otherwise stated

Table 2 Length of hospital stay for patients by time period

Length of stay	Time period	
	2000–2007	2008–2014
Day case procedure	2	25
Non-day case ≤48h	12	6
48–72h	5	2
72–96h	7	0
>96h	0	1

Adverse outcomes

One patient required unplanned surgery following elective LHM for a Grade IVa complication. He was a 22-year-old man who underwent elective surgery in 2009, and had a postoperative mediastinal leak requiring emergency repair, followed by subsequent oesophagectomy. He stayed in hospital for a total of 40 days.

One (1.7%) patient presented to the emergency department within 30 days of surgery. He was a 39-year-old male who underwent day case elective surgery in 2012, and presented with symptoms of chest pain 2 days later. The cause of his symptoms was not identified, and he was discharged after simple analgesia.

Balloon dilatation was required within 12 months due to recurrent symptoms in six (10%) of all patients (Table 3).

Three required a one-off dilatation, two required dilatation twice, and one patient required four dilatations for symptom control. No patients required revision surgery.

Discussion

The main finding from this cohort is that LHM has been increasingly performed as a day case procedure. Following the establishment of routine day case protocol for LHM, day case surgery was performed in 73.5% of cases, versus only 7.7% in the prior 7 years, a finding that reflects the change in practice and learning curve of specialist experience at our institution. There were no significant differences in patient characteristics between day case and non-day case patients. The current study also demonstrates a

low re-intervention (balloon dilatation) rate of 10%, a finding comparable to the 7.7% reported in a recent meta-analysis.²¹ Furthermore, LHM was a safe procedure, with adverse outcomes rare: one patient (1.7%) suffered a complication. This is comparable to the complication rate of 2.1% reported in the meta-analysis.²¹

At present, the mainstream treatment options for achalasia include pneumatic dilatation and surgical LHM. The European Achalasia Trial randomised patients at 14 centres in five countries to either LHM or pneumatic dilatation (allowing up to three dilatations), and found comparable therapeutic success rates at 2-year follow up.²² A recent meta-analysis comparing these two procedures found that re-treatment was required for relapse in 43% cases of endoscopic balloon dilatation, but in only 7.7% of those undergoing LHM, with no statistical difference in complication rates.²¹ With improving minimally invasive surgical techniques, and shorter hospital stay, surgical LHM may therefore become an increasingly favourable option for the treatment of achalasia versus endoscopic therapy. The potential adoption of LHM as the 'gold standard' treatment for achalasia will need to go hand-in-hand with the development of optimal hospital pathways and health professional education.

Earlier single-centre studies have shown good results with LHM, and may increase the enthusiasm for the surgical approach to treatment of achalasia. Zaninotto *et al* reported outcomes in 100 patients treated between 1995 and 1998, with a median LOS of 4 days,¹² while Patti *et al* reported a mean LOS of 42 hours in 102 patients treated between 1995 and 2000.¹⁵ Some studies have demonstrated shorter hospital stays that approach that of a 'day case'. Sharp *et al* report a mean LOS of 1.3 days in 100 patients treated between 1992 and 2001,¹⁴ and this unit reported a mean LOS of 1.9 days for 24 patients treated between 2000 and 2007.¹⁵ In the latter publication, we suggested that LHM ought to be considered a true 'day case' procedure. Data from the current study is in keeping with that assertion, with the caveat that its retrospective and single-centre design may limit its generalisability. However, rather than synthesise new conclusions, these data instead add to a

Patient	Year	Age (years)	M/F	Ethnic Group	Prior botox	Prior endoscopic dilatation	LOS	Balloon dilatations (n)
1	2004	39	M	British	No	Yes	4	2
2	2010	22	M	British	No	No	Day case	2
3	2011	47	F	British	No	No	Day case	1
4	2012	38	M	Pakistani	No	No	Day case	4
5	2012	36	M	British	No	No	1	1
6	2013	64	M	British	No	Yes	Day case	1

Abbreviations: F, female; LOS, length of hospital stay; M, male

growing body of evidence in favour of a surgical approach to achalasia that is minimally invasive, safe for patients and approaching a true 'day case' treatment.

LHM for achalasia is a rare procedure, with each surgeon performing only a small number of cases in this cohort. Unlike laparoscopic cholecystectomy, which is a well-established 'day case' procedure, the rarity of LHM occurrences has not traditionally lent itself well to having a familiar and well-rehearsed in-hospital pathway. We propose that a 'day case' pathway for LHM is both safe and feasible for suitable patients, and advocate that this should be the standard of care in the United Kingdom. An important question to then address is: What is the best way to perform day case LHM? The patients in the current study were treated at a unit with a high volume of benign laparoscopic hiatal surgery, in line with an established day case protocol used for another procedure.¹⁶ Using such an approach may be advantageous for administrative, nursing and medical staff, due to its familiarity and lack of unnecessary duplication. Since LHM is a relatively uncommon procedure for a rare pathology, results from the current study may demonstrate that it is sensible to centralise LHM surgery to centres with a high volume of benign laparoscopic hiatal surgery. This may enable the establishment of well-defined and well-rehearsed patient pathways as the best mechanism in which to deliver such a service.

Conclusions

LHM is an uncommon procedure for a rare condition. Surgical treatment has increasingly been performed safely as a day case procedure over the last 14 years. Complication rates are relatively low, with only a small proportion of patients requiring endoscopic treatment of symptom recurrence within a year. It may be timely to call for a consensus agreement over the suitability of LHM as a day case procedure.

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Disclosures

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