Laparoscopic Cholecystectomy in Patients Over 80 years is Feasible and Safe: Analysis of 68 Consecutive Cases

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ABSTRACT

Background: Wide variations are reported in morbidity, mortality and conversion rates for laparoscopic cholecystectomy in the octogenarian population. As a retrospective review, this paper reports the experience of a district general hospital unit in the management of gallstone disease in an elderly population.

Methods: The case notes of all patients over 80 years of age undergoing laparoscopic cholecystectomy over a 7 years period were retrospectively analyzed. Primary outcome measures were conversion to an open procedure and complications of surgery.

Results: Sixty eight octogenarians (mean age of 84 years [range 80-96 years], 37 female) undergoing laparoscopic cholecystectomy were identified. Five (7.3%) operations were converted to open surgery.

The total number of patients having complications was 16 (24%), 8 (12%) being grade 1 and 8 (12%) grade 2. Forty eight (71%) patients had complicated gallstone disease. Grade 2 complications were related to the presence of CBD stones (p = 0.0003).

Conclusions: Octogenarians should be considered for laparoscopic cholecystectomy for symptomatic gallstones. Although the overall risk of complications remains higher in octogenarians, conversion rates can be low. Octogenarians with common bile duct stones may be best managed with ERCP as this group of patients appears to be at particular risk from surgical intervention.

Keywords: Octogenarian, cholecystectomy, conversion

INTRODUCTION

Improvements in perioperative care for the ageing population have resulted in an increasing number of elderly patients being considered for surgery. With an incidence of gallstone disease of 14 to 27%,[1] it is inevitable that significant numbers of elderly symptomatic patients are referred for surgery despite historical concerns over comorbid conditions and more complex gallstone disease.

Increased risks and complications of surgery in the elderly[2] may be reduced by minimally invasive surgery which is associated with a shorter hospital stay and fewer complications in elderly patients.[3] However, even with laparoscopic surgery the population over 80 years old undergoing laparoscopic cholecystectomy may have morbidity rates of 2.2-24% and mortality rates of up to 2.8%.[3-7]

The potential benefits of laparoscopic surgery may be lost if conversion to an open operation is necessary. If not unduly delayed, conversion carries similar risks to open cholecystectomy, whereas 'enforced' conversion usually following severe iatrogenic injury or bleeding is associated with higher morbidity and mortality.[8] Patients over 80 years generally have higher conversion rates of 2.2-37%,[3-5,9-11] the most significant factor being the increased incidence of complex pathologies related to gallstones. The incidences of acute and chronic cholecystitis, severe scarring and adhesions, common bile duct stones, gallstone pancreatitis, previous upper abdominal surgery and gallbladder cancers are all increased in the elderly population.[5,6,12]

This paper reports the experience of a district general hospital unit in the management of gallstone disease in a population over 80 years old.

MATERIAL AND METHODS

The records of all patients over the age of 80 years undergoing laparoscopic cholecystectomy between January 2000 and June 2007 were retrospectively analyzed. Age, sex and American Society of Anesthesiologists (ASA) grade and indications for surgery were recorded. The method of evaluation of bile duct stones was noted on preoperative ultrasound, MRCP or ERCP, or intraoperative cholangiography. The difficulty of surgical dissection of the gallbladder and Calot's triangle was assessed from the operating notes. "Difficult" dissections were considered as those where the operation note commented on dense adhesions of colon, duodenum or omentum, a thick walled gallbladder, empyema of the gallbladder or a shrunken fibrotic gallbladder. The mode of surgery was classified as either elective or emergency. For elective cases the patient with no acute symptoms had a planned admission either on the day of surgery

or the preceding day. Emergency cases were defined as those where admission was for acute symptoms, which persisted or worsened indicating urgent surgical intervention.

Laparoscopic cholecystectomy was performed using a three or four port technique. Cholangiography was performed selectively. Common bile duct (CBD) stones were managed with either laparoscopic bile duct exploration or postoperative ERCP according to the operating surgeon's preference. The grade of the operating surgeon was noted. The duration of the procedure was recorded from anesthetic charts.

Primary outcome measures were conversion to an open procedure and complications of surgery, including 30 days mortality. Complications were recorded according to a previously described classification:[13]

- Grade 1: minor complications treated with bedside therapy such as urinary retention.
- Grade 2: complications that require potentially morbid interventions such as treatment of arrhythmias, surgery or other invasive procedure.
- Grade 3: complications that result in a residual disability such as myocardial infarction or CVA.
- Grade 4: death.

Length of postoperative hospital stay was also recorded.

Statistical analysis was performed using Chi-square test for categorical variables and t-test for continuous variables. Significance was accepted at a level < 0.05.

RESULTS

Sixty eight patients over 80 years [mean age of 84 years (range 80-96 years), 37 female] were identified as having undergone laparoscopic cholecystectomy as a primary procedure. This represented 0.03% of all laparoscopic cholecystectomies performed during this period.

Significant medical comorbidity was recorded in 32 (47%) patients with ASA $\geq$ 3.

Forty eight (71%) patients had complicated gallstone disease, 23 (34%) with cholecystitis, 28 (41%) with common bile duct stones and 7 (10%) with pancreatitis. Thirty eight (56%) had a difficult dissection. Fifty five (81%) of operations were performed electively and 42 (62%) cases were performed by a consultant surgeon. Of the 26 cases started by specialist registrars, 12 had to be completed by consultants (Table 1).

The mean duration of surgery (excluding 1 case of a planned combined antireflux procedure) was 90 minutes (s.d. ± 47 minutes). Five (7.3%) operations were converted to open surgery. The total number of patients having complications was 16 (24%), 8 (12%) being grade 1 and 8 (12%) grade 2. The median length of hospital stay was 3 nights (interquartile range 2-7). Outcome measures are summarized in Table 2. Reasons for conversion to open surgery are summarized in Table 3.

Table 1: Demographics of octogenarians (n = 68) undergoing laparoscopic cholecystectomy

Age; years*	84 (80-96)
Sex; M : F	31 : 37
ASA grade;	
I	2 (3%)
II	50 (%)
> III	32 (47%)
Complicated gallstone disease	48 (71%)
Cholecystitis	23 (34%)
Common bile duct stones	28 (41%)
Pancreatitis	7 (10%)
Difficult dissection	38 (56%)
Timing of surgery	
Elective	55 (81%)
Emergency	13 (19%)
Operating surgeon	
Consultant	42 (62%)
Specialist registrar	14 (21%)
Specialist registrar, completed by consultant	12 (17%)

*Mean

Table 2: Outcome measures for octogenarians (n = 68) undergoing laparoscopic cholecystectomy

Duration of surgery; minutes*	90 (± 47)
Conversion to open surgery	05 (7.3%)
Complications	16 (24%)
Grade 1	08 (12%)
Grade 2	08 (12%)
Grade 3	00
Grade 4 (30 day mortality)	00
Length hospital stay; postoperative nights[]	03 (2-7)

*Mean and standard deviation
[] Median and interquartile range

Table 3: Reasons for conversion to open cholecystectomy

Reasons for conversion	*Number of cases*
Gallbladder carcinoma	1
Acute inflammation Calot's triangle	2
Chronic inflammation/ scarring	2

The grade 1 complications were: three cases of acute urinary retention, one minor respiratory tract infection, one wound infection, one urinary tract infection, one intraoperative bleed not requiring transfusion and one case of surgical emphysema complicating a difficult first port insertion. The grade 2 complications necessitated transfusion or operative intervention. One patient had laparoscopy and washout to investigate severe postoperative pain although no bile leak or perforation was identified. There were four cases of significant hemorrhage, two managed by transfusion and two requiring laparotomy and washout. One case of bile leak was managed with laparotomy, CBD exploration and removal of CBD stones. There were two (3%) cases of bile duct injuries, one presenting

as a postoperative bile leak managed by laparoscopy, washout and laparoscopic repair of a CBD injury. The second, a hepatic duct injury complicating laparoscopic bile duct exploration, was recognized at the time of surgery and repaired laparoscopically. The grade 2 complications are summarized in Table 4.

Subgroup analyses were performed for the cases converted to open surgery and those having grade 2 complications. These two groups were compared to the remainder of the cohort for significant differences in ASA grade (≥ III), age, sex, complications of gallstone disease, difficulty of dissection, timing of surgery and grade of operating surgeon. The converted cases had significantly higher incidences of emergency surgery and difficult dissections (Table 5). For patients with grade 2 complications there was a significant difference in the history or presence of CBD stones (Table 6).

Table 4: Summary of grade 2 complications from laparoscopic cholecystectomy (n = 8)

Grade 2 complication	*Intervention*	*Number of cases*
Postoperative hemorrhage	Blood transfusion	2 (3%)
Postoperative hemorrhage and peritonism	Laparotomy and washout of hematoma	2 (3%)
Postoperative peritonism	Laparoscopy no bile leak/hematoma	1 (1%)
Bile-leak and peritonism	Laparotomy, CBD exploration and extraction of stones	1 (1%)
Bile duct injuries	Laparoscopic repair	2 (3%)

Table 5: Comparison of the timing of surgery and the difficulty of dissection between cases converted to open surgery and those completed laparoscopically

	Converted (n = 5)	*Laparoscopic (n = 63)*	*p-value*
Timing of surgery			
Emergency	3	10	0.016
Elective	2	53	
Dissection			
Difficult dissection	5	33	0.039
Straight forward dissection	0	30	

Table 6: Comparison of the incidence of common bile duct stones between patients suffering grade 2 complications and those with either grade 1 or no complications

	Grade 2 complications (n = 8)	*Grade 1 or no complications (n = 60)*	*p-value*
Common bile duct stones	8	20	0.0003
No common bile duct stones	0	40	

DISCUSSION

This series demonstrates that laparoscopic cholecystectomy is safe and efficacious in the patients over 80 years. Thirty seven (54%) of our patients with an age range 80 to 91 years left hospital within 5 days without complications from surgery. Symptomatic gallstones can have a significant impact on an individual's quality of life and with the increasing life expectancy and quality of health of octogenarian patients, a substantial number will realize the benefits of surgery.

Our conversion rate of 7.3% compares favorably with previous studies. Lower conversion rates (2.2%) have only been quoted for cohorts with a small proportion of urgent cases (4.4%). The importance of the learning curve of the operating surgeon is well-documented for the incidence of bile duct injury, conversion rates and morbidity associated with laparoscopic cholecystectomy.[8] Increasing confidence and experience in the techniques of laparoscopic dissection are likely to have contributed to the low conversion rate in this series. An improvement in conversion rates over time has been noted previously for elderly patients (65-79 years) although not in patients over 80 years.[6]

Whilst we have shown favorable outcomes this data does reaffirm that laparoscopic cholecystectomy in the elderly can be a challenging surgical undertaking. Thirty two (47%) patients had serious comorbidity with an ASA grade ≥ III. Forty eight (71%) had complex gallstone disease and 38 (56%) a complex surgical dissection.

The high percentage of ASA grades ≥ III is not unexpected in our population and in keeping with previous octogenarian populations undergoing laparoscopic cholecystectomy.[5,6] The associated comorbidities would account for the prolonged median length of hospital stay of 3 (i.q. range 2-7) nights seen in our patients. The ASA grade however did not show any association with either conversion to open surgery or grade 2 complications from surgery.

The high incidence (71%) of complicated gallstone disease was consistent with the previous studies of laparoscopic cholecystectomy in the elderly,[5,6,12] partly explaining a difficult dissection in 38 (54%) cases and in defining outcomes for these patients. In the group of patients requiring conversion to open surgery there was a significantly increased number of emergency procedures ($p = 0.016$) and difficult dissections ($p = 0.039$) with dense adhesions or scarring around the gallbladder and Calot's triangle. Difficult dissection is probably the commonest cause for conversion.[8] Whilst complicated gallstone disease should alert the surgeon to a potentially difficult dissection, even patients reporting only biliary colic may have difficult dissections, as in 9 of our cases.

The grade of operating surgeon (consultant vs specialist registrar) starting the operation was not related to conversion rates or grade 2 complications ($p > 0.05$). However almost half

of the cases started by a specialist registrar had to be completed by a consultant, underlining the need for senior surgical involvement in these cases.

The complication rate (24%) was comparable to rates of 2.2-26% from previous studies of laparoscopic cholecystectomy in octogenarians.[3,5-7] The grade 2 complications were all directly related to cholecystectomy. The most striking feature of these cases was the statistically significant incidence of CBD stones ($p = 0.0003$). Whilst the bile duct injuries and bile leak can be directly related to the presence of CBD stones, this was not an exclusive factor. Three patients in our series underwent laparoscopic bile duct exploration, one of which was complicated by a hepatic duct injury. The debate concerning ERCP or laparoscopic bile duct exploration has favored laparoscopic exploration,[14] dependent upon local expertise and availability. Little of the existing data comes from octogenarians and this series suggests that the risks of an operative approach are higher.

CONCLUSION

Patients over 80 years should be considered for laparoscopic cholecystectomy for symptomatic gallstones. Although the overall risk of complications remains higher in these patients, conversion rates can be low. Patients over 80 years with common bile duct stones may be best managed with ERCP as this group of patients appears to be at particular risk from surgical intervention.

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