Laparoscopic surgery in the elderly patient

Experience of a single laparoscopic unit

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Abstract

Background: Elderly patients represent a unique surgical challenge because of the associated complex comorbidity and diminished cardiopulmonary reserve. Therefore, minimally invasive surgery in the elderly may have a larger impact compared to the younger population. The aim of this study was to prospectively evaluate the experience of laparoscopic surgery in patients ≥70 years of age in our unit.

Methods: Two hundred and thirty-two patients (34 females and 98 males) older than 70 years who underwent various elective and emergency laparoscopic procedures between 1992 and 1997 were assessed prospectively. Preoperative comorbidity, operative results, and postoperative outcomes were analyzed.

Results: The median age of the patients was 76 years. The majority of patients were ASA class II. The mean hospital stay was 3.4 days. The overall morbidity and mortality rates were 10.8% and 3.4% respectively, and the conversion rate was 4.3%.

Conclusions: Our experience suggests that laparoscopic surgery in the elderly is safe, is associated with short hospital stay, and produces less morbidity and mortality. Therefore, it should be adopted widely if the expertise in the area of laparoscopic surgery is available for this group of patients.

Key words: Elderly — Laparoscopic surgery — Complications

The aging population in the Western world [30] will determine trends in health care in the following decades. Currently, 40% of all surgical activities are targeted toward treating patients older than 65 years of age [21].

Patients and methods

Between January 1992 and December 1997, 1389 consecutive patients underwent laparoscopic surgery. Of these, 232 patients were older than 70 years of age (134 females and 98 males), with a median age of 76 years (range, 70-95 years). The clinical conditions requiring surgery are summarized in Table 1. Forty-seven patients with acute cholecystitis underwent emergency laparoscopic cholecystectomy (LC), and the remaining 185 patients had other elective procedures (Table 1). Patients were followed up postoperatively for a minimum of 6 months.

All patients had routine full blood count, urea and electrolytes, liver function tests, respiratory function tests, electrocardiographs, and X-rays of the chest and abdomen. The anesthetic risk was assessed according to the American Society of Anesthesiologists’ (ASA) classification. Patients with acute pancreatitis also underwent a computerized tomography (CT) scan of the abdomen to classify them according to Balthazar criteria [5]. Patients with gastric neoplasm had a CT scan of the abdomen, gastrointestinal upper (GI) endoscopy, and contrast studies. Finally, those patients undergoing antireflux surgery had preoperative upper GI endoscopy, esophageal manometry, and 24-h pH monitoring.

In all cases, the surgical intervention was carried out using the French technique, with a pneumoperitoneum of ≤8 mmHg so as to avoid cardiovascular compromise. In two high-risk patients, a wall retractor was employed to lift the anterior abdominal wall for laparoscopic surgery. The surgical procedures performed are outlined in Table 2.

For gallstone disease, LC was conducted using three trocars (10-mm right periumbilical, 10-mm left paramedian, and 5-mm right iliac fossa). Routine intraoperative cholangiography was performed in all patients. In cases of acute cholecystitis and difficult dissection, a fourth
Table 1. Clinical conditions requiring laparoscopic surgery

<table>
<thead>
<tr>
<th>Clinical conditions</th>
<th>No. of patients (%)</th>
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<tbody>
<tr>
<td>Gallstones</td>
<td>118 (50.8)</td>
</tr>
<tr>
<td>Acute cholecystitis</td>
<td>47 (20.2)</td>
</tr>
<tr>
<td>Pancreatitis</td>
<td>21 (9)</td>
</tr>
<tr>
<td>Gastrointestinal reflux disease</td>
<td>29 (12.5)</td>
</tr>
<tr>
<td>Gastric neoplasm</td>
<td>12 (5.1)</td>
</tr>
<tr>
<td>Sigmoid colon carcinoma</td>
<td>5 (2.1)</td>
</tr>
<tr>
<td>Total</td>
<td>232</td>
</tr>
</tbody>
</table>

10-mm trocar was placed in the right subcostal area. In cases of acute pancreatitis, a fifth 10-mm trocar was also placed in the right subcostal area in the optimum position for the insertion of the choledochoscope and exploration of the common bile duct (CBD) for stone extraction. The CBD stones were retrieved either under direct vision or under fluoroscopy using Dormia basket. In the case of impacted stone in the duodenal papilla, an immediate postoperative endoscopic retrograde cholangiopancreatography (ERCP) was conducted. Every patient had a peripancreatic Penrose drain in situ, and abdominal CT scans were performed at 1-, 3-, and 6-month intervals to confirm resolution of pancreatic inflammation.

For patients with gastroesophageal reflux, Nissen–Rossetti fundoplication was performed using standard port configuration. In one patient with peptic ulcer disease, bilateral truncal vagotomy and pyloroplasty were also performed. In cases of gastric neoplasm, subtotal gastrectomy with Billroth II reconstruction was performed using the technique described previously [4]. For patients with left colon cancer, a laparoscopically assisted left hemicolectomy was carried out using standard port configuration.

Results

Of 232 patients included in the study, 175 patients (75%) were between 70 and 80 years old, 55 patients (24%) were between 81 and 90 years old, and only 2 patients (1%) were older than 90 years. According to ASA classification, 128 patients (55.2%) were in class II, 87 patients (37.5%) were in class III, and 17 patients (7.3%) were in class IV. The mean hospital stay was 3.4 days (range, 2–27 days). There were a total of 8 deaths, resulting in an overall mortality of 3.4% (Table 3). The overall morbidity was 10.8% (Table 4). In our series, the conversions rate was 4.3% (i.e., 10 patients). The reasons for conversion were technical difficulties (6), cholecystoduodenal fistula (2), Mirizzi syndrome (n = 1), and umbilical vein hemorrhage (n = 1).

Discussion

Disorders of the digestive system requiring surgical intervention are more prevalent in older patients, as is the prevalence of comorbid conditions, especially that of cardiac, respiratory, renal, and immune systems, which adversely affect the postoperative outcome [26, 36]. However, recent advances in anesthesia, coupled with better patient selection, better perioperative cardiac care, and widespread adoption of minimally access surgery, have led to more complex GI procedures being undertaken for elderly patients [20]. There remain some concerns when performing minimally invasive surgery in the elderly. The increase in intraabdominal pressure during pneumoperitoneum can lead to an increase in the systemic vascular resistance and central filling pressures with a decrease in cardiac index, which may be detrimental in elderly patients with limited cardiac reserves [14]. A high insufflation pressure may also compress the inferior vena cava, further compromising venous return and cardiac output. In view of these concerns, we used a low insufflation pressure of ≤ 8 mmHg to minimize any such cardiovascular problems.

Gallstone disease shows a linear increase with age and is the most common indication for abdominal surgery among the elderly [15]. Furthermore, in the elderly it presents late and is associated with much higher morbidity and mortality [32]. Therefore, a more aggressive approach to symptomatic cholelithiasis in the form of elective surgery is justifiable. This concept has been reinforced by the excellent results produced by LC in the elderly. Reported overall mortality rates after LC in elderly patients vary from 0% to 1.6% [9, 10, 12, 22–25, 27–29, 41]. This is substantially less than the mortality reported after open cholecystectomy (OC) in elderly patients, which varies between 0.8% and 13% [16, 18, 19, 38]. In our series, 186 patients underwent LC, of which 3 (1.6%) died. Our mortality rate for LC therefore compares favorably with that of the current literature (Table 5). The incidence of postoperative complications after LC (Table 4) was 7%, which is similar to other series (Table 5), and substantially lower than the rates of 18% to 35% after elective OC in elderly patients[13, 16–19, 26, 38]. Respiratory complication were the major problem occurring in only 3 (1.6%) patients. This is significantly lower than the incidence of pneumonia following OC in the elderly, which varies between 6% and 13%. Lastly, our 4.3% conversion rate of LC to an open procedure was lower than that of other reported series in elderly patients undergoing LC (Table 5). Difficulty in resolving the distorted anatomy was the cause in the majority of our patients.

Techniques for laparoscopic antireflux procedures and gastric and colonic surgery have been consolidated in recent years. Brunt et al. [7] found no mortality in 339 patients undergoing laparoscopic antireflux surgery. Thirty-six patients were aged 65 years or older and had a complication rate of 16.7% vs 4.3% in 303 patients younger than age 65. These results were comparable with those of a similar-sized retrospective comparison of elderly and nonelderly patients undergoing laparoscopic antireflux surgery [42]. We performed 29 Nissen fundoplications with no mortality and minimal morbidity, all of which responded to conservative treatment (Table 4).

The incidence of both benign and malignant disease of the colon increases with chronological age. A number