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Laparoscopy in the acute abdomen



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A B S T R A C T

Laparoscopy has become a routine procedure in the management of acute abdominal disease and can be considered both an excellent therapeutic and additional diagnostic tool in selected cases. However, a high level of expertise in laparoscopic and emergency surgery is required. Hemodynamic instability, huge abdominal distension, fecal peritonitis and perforated cancer are relative contraindications for the laparoscopic approach. In recent years, abdominal emergencies have increasingly been managed successfully by laparoscopy. In acute appendicitis, acute cholecystitis and perforated peptic ulcer, randomized controlled trials have proven that the laparoscopic approach is as safe and as effective as open surgery, with fewer complications and a quicker post-operative recovery. Other indications such as blunt and penetrating trauma to the abdomen, small bowel occlusion and perforated diverticular disease are under debate, indicating that more randomized controlled trials comparing laparoscopic and open surgery are still necessary.

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An acute abdomen results usually from peritoneal irritation due to inflammation or rupture of an abdominal organ or obstruction of a hollow organ. In hospital practice, patients with acute abdominal pain either go spontaneously to the emergency room or are sent there by their family doctor with a provisional diagnosis, which reportedly has no more than a 50% chance of being correct [1]. After an accurate diagnostic workup including blood sample, ultrasound and/or computed tomodensitometry (CT), an etiologic diagnosis can be established, leading or not to a surgical indication. In some patients, the reason for the acute abdomen remains unclear and there are two options: either the patient is

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observed clinically and re-examined after a few hours to detect any change, or a diagnostic laparoscopy (DL) is performed. However, laparoscopy should not be considered as a routine diagnostic tool for every case of acute abdomen, as it carries its own morbidity and requires a general anaesthesia.

Although it is incorrect to hypothesize that all patients with acute abdominal pain would benefit from laparoscopic surgery, it is evident that over the years an increasing number of patients has been managed successfully in emergency thanks to the laparoscopic approach [2]. The aim of this review was to define the best indications for laparoscopy in acute abdominal disease.

Is laparoscopy safe in a patient with abdominal sepsis?

In the early nineties, the routine use of laparoscopy in case of abdominal sepsis was controversial for several reasons: risk of bacteraemia and endotoxemia, risk of hypercapnia and risk of missing purulent abdominal collections. However, many authors have since demonstrated its safe use [3,4].

Animal studies showed that the influence of pneumoperitoneum on bacteraemia and endotoxemia was controversial and no conclusion could be drawn [5]. In the vast majority of published series, pneumoperitoneum did not appear to increase massive bacteraemia and/or septic shock. In a recent comparative study including 115 consecutive patients with generalized peritonitis from perforated peptic ulcer (PPU), open peptic ulcer repair increased the incidence of bacteraemia, endotoxemia and systemic inflammation compared with laparoscopic repair. Moreover, it was hypothesized that early enhanced postoperative systemic inflammation might cause transient decrease in immunologic defence after laparotomy leading to enhanced sepsis in these patients [6]. Similar results were reported by the same author in patients with generalized appendicular peritonitis [7].

In routine practice, when performing a laparoscopy for sepsis, it is preferable to keep the intra-abdominal pressure under 12 mmHg and sometimes between 6 and 8 mmHg in very high-risk patients. Moreover, intravenous antibiotic therapy should be started in all cases of suspected sepsis prior to inducing a pneumoperitoneum. By taking these measures, both the dissemination of infection and the negative hemodynamic effects of a pneumoperitoneum are limited. A good collaboration with the anaesthesiology team is also mandatory. Concerning the risk of missing purulent collections, it is advised to explore the entire abdominal cavity by rotating the operating table to each side, as well as by putting the patient in the Trendelenburg position to check the Douglas pouch and the intermesenteric spaces.

Indications and contraindications

Irreversible septic shock and/or huge abdominal distension due to ileus, as well as suspected perforated cancer are currently considered contraindications for a laparoscopic approach. Fecal peritonitis is also usually considered as a relative contraindication. Lack of expertise in laparoscopy is an absolute contraindication in emergency surgery. In high-risk patients, whether to use a laparoscopic approach or not will depend on how the patient responds to the pneumoperitoneum. In case of abdominal distension, the quality of exposure will influence the decision to proceed with a laparoscopy.

The best indications for laparoscopy in case of an emergency are appendicitis, cholecystitis and PPU. The use of laparoscopy in cases of perforated diverticulitis, small bowel obstruction (SBO) and abdominal trauma is still under debate. Laparoscopy can also occasionally be used in cases of post-colonoscopy perforation, mesenteric ischaemia, complicated Meckel's diverticulum, intra-abdominal abscess inaccessible to percutaneous drainage, postoperative peritonitis, necrotic pancreatitis.

Acute appendicitis

Appendicitis is the most common abdominal emergency. To establish the diagnosis, investigations such as C-Reactive Protein, White Blood Count, ultrasound and sometimes CT are helpful in addition to clinical exam.

Laparoscopy is also useful as a diagnostic tool. In 14–27% cases of suspected appendicitis, another diagnosis is found at laparoscopic exploration, such as salpyngitis, ovarian cyst, diverticulitis, ileitis,

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