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REVIEW

Emergency laparoscopy: Role and implementation

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Summary Laparoscopic surgery has emerged over the past two decades as the surgical approach of choice in the treatment of many digestive disorders. Laparoscopy has its place in the management of abdominal surgical emergencies since it provides the same benefits: less postoperative pain and shorter length of hospital stay when compared to laparotomy. However, its role in the management of abdominal emergencies has not yet been fully clarified. In this review, we focus on what has been validated concerning the role of emergency laparoscopy in the management of abdominal diseases.

Introduction

Laparoscopic surgery has emerged in the last two decades as the approach of choice for the treatment of many digestive disorders especially colonic and biliary [1,2]. However, its role in the management of abdominal emergencies has not yet be fully elucidated [3].

Non-traumatic abdominal emergencies refer to acute abdominal pain defined as any moderate or severe abdominal pain lasting less than seven days [3]. Laparoscopy in the management of acute pain has its place as it provides the same benefits as elective surgery: less postoperative pain and shorter duration of hospital stay when compared to laparotomy [4—6]. It must not be forgotten, however, that this is only a surgical approach, with its limits, and in the frame of emergency surgery, the priority remains rapid, effective single-stage resolution of the causal disease. In this update, we concentrate on what has been validated concerning the role of laparoscopy in the management of emergency abdominal disease.

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Non-specific abdominal pain

Acute abdominal pain is defined by its sudden and intense (localized or diffuse) character calling for emergency medical or surgical management because of its potential life-threatening risk. The most frequent causes of acute abdominal pain in the emergency setting are: non-specific abdominal pain (NSAP; 35%), appendicitis (17%), intestinal obstruction (15%), urinary tract (6%), biliary disease (5%), colonic diverticular disease/diverticulitis (4%) and pancreatitis (2%) [7].

NSAP is defined as acute abdominal pain lasting less than seven days for which diagnosis remains uncertain after initial clinical examination and appropriate diagnostic test [8]. In this situation of incertitude, diagnostic laparoscopy can be applied safely to selected patients [3].

What is unknown however is that the definition of ''optimal diagnostic workup'' before deciding on surgery is not resolved because there is no available validated algorithm or guidelines [9,10].

Generally speaking, all patients presenting to the emergency department for abdominal pain should have a meticulous history, a general physical examination, a complete blood profile (red and white blood counts, blood ionogram, kidney function tests, glycemia) and an urinary tract bacteriology (urinary dipstick ± cultures). Pregnancy tests are mandatory for all women of childbearing age. A complete liver profile (including serum lipase) should be ordered for all patients with epigastric or right upper quadrant pain.

An abdomino-pelvic CT scan is currently considered as essential before labeling any abdominal pain as NSAP [11,12].

Diagnostic laparoscopy (DL) therefore has its place in the etiologic and therapeutic armamentarium of emergency abdominal pain, as long as preoperative workup has been correctly performed and merits systematization.

Effectively, several studies have documented the feasibility and security of LD in this situation [6,13—15], with high diagnostic precision, ranging from 87 to 100% [14,16,17], avoiding non-therapeutic laparotomy in 36—95% of patients [3,14]. Morbidity ranges from 0—9% [3,6,18]; conversion from 0.15—13% [3,6,14—18]. Most severe complications stem from unrecognized small intestinal perforations [18]. Mortality directly related to surgery is nil or very low [13,16—19].

The contraindications to DL are the same as for exploratory laparotomy [14].

The value of early DL, relative to hospital surveillance, was evaluated extensively during the 1990s by randomized studies [20,21]. Results, however, were heterogeneous and difficultly transposable to real-life, most likely because of small numbers of the populations and the absence of long-term survival.

The available literature on DL has several biases: lack of homogeneity in the populations studied and frequent absence of high quality preoperative imaging that could have provided a diagnosis without resorting to an invasive procedure [3].

While DL has been regularly shown to be feasible, better methodologic studies are still necessary to precisely evaluate its role in the management of patients with NSAP.

Acute cholecystitis

The laparoscopic approach has become the ''gold standard'' for patients with acute cholecystitis [3,22]. Two questions remain:

- the ''ideal'' delay before operation;
- the place of percutaneous gallbladder drainage.

Arguments in favor of early surgery include less technical difficulties, arrest of disease and less complications [23]. Banz et al. [24] have shown that delay in performance of cholecystectomy led to higher conversion rates, more postoperative complications and significantly longer hospital stay. Conversely, other authors have underlined deceiving results of early surgery: more morbidity, in particular in patients with symptoms longer than 48—72 hours [24—26]. Finally, a shorter postoperative hospital stay seems to be the only undebatable advantage of early cholecystectomy [25]. While laparoscopy is recommended, this approach is not without any complications: the risk of main bile duct injury is higher with laparoscopy compared with laparotomy (0.46—0.47% vs. 0.19—0.20%) with a conversion rate over 5% [22].

The rational behind percutaneous drainage (cholecystostomy) is to arrest progression of the natural history of disease while treating associated disease, often severe in the elderly or patients in intensive care. Attesting to this idea, the number of cholecystostomies has increased nearly six-fold in the United States in recent years [27]. The procedure is technically easy. However, some series have shown a lack of clinical improvement and the need for emergency cholecystectomy in approximately 20% of patients [23]. Moreover, while not many major complications have been reported during percutaneous drainage, the complication rate once cholecystectomy is finally performed can be as high as 30% [23,27,28]. Last, this modality is debated because the indications are not well defined, non-protocoled, with a high re-admission rate leading to discuss once again what to propose to this group of patients [28].

Another widely debated question is the place of laparoscopy for severe cholecystitis (gangrenous, gallbladder empyema or perforation). In a recent review of the literature, laparoscopy was not associated with an increased risk of postoperative complications [2]. Therefore, if the experience of the surgeons allows, laparoscopy is acceptable in this setting in spite of a three-fold increased conversion rate [2,3].

Last, subtotal cholecystectomy is an acceptable solution in patients with intense inflammation of the gallbladder pedicule, which increases the risk of bile duct injury when dissecting the structures of Calot's triangle [29]. Several surgeons have staple-closed the gallbladder neck after anterograde dissection as an alternative with good results.

Acute appendicitis

Traditionally, male patients with a clinical history, suggestive symptoms and clinical examination strongly compatible with the diagnosis of acute appendicitis should undergo laparoscopy without any need for complementary investigations [3]. However, performing sonography and/or abdomino-pelvic CT scan, in less typical cases, seems to be able to reduce the rate of *appendicectomies blanches* and decrease the rate of unsuspected perforations [30].