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Original Research Article

Hospital based retrospective assessment of the efficacy of laparoscopic appendectomy and conversion rate of laparoscopic appendectomy to open appendectomy

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Abstract

Aim: To study the efficacy of laparoscopic appendectomy as well as conversion rate of laparoscopic appendectomy to open appendectomy.
Methodology: A Hospital based retrospective study of 100 patients who had undergone laparoscopic appendectomy at the department of general surgery was included for this study. The files of the patients were collected from the medical record section of hospital and studied. Categorical variables were presented as frequency. Ethical approval was approved by department research unit and department of surgery, Varun Arjun Medical College & Rohilkhand Hospital, Banthra Shahjahanpur U.P India.
Results: Out of 100 patients, Majority (61%) were between 20 years to 40 years of age followed by <20 and > 40 years of age (28% and 11% respectively). Most of the patients (64%) were presented with complains of pain localized in lower abdomen associated commonly with vomiting. Only 23% patients had post-operative complications, most common being pain at surgical site. The duration of hospital stay was shorter as 3 days for most of the patients (43%). Conversion rate from laparoscopic appendectomy to open appendectomy was only 10% with cause being uncontrolled bleeding, perforation of base of appendix and appendicular lump during period of this study.
Conclusion: Laparoscopic appendectomy in patients with acute appendicitis can be considered a safe procedure. There is no significant difference in postoperative complications between patients who undergo laparoscopic and open appendectomy. Although the duration of the laparoscopic operation is longer, the hospital stay is shorter, with earlier recovery.

Keywords: Laparoscopy, appendectomy, acute appendicitis

Introduction

Appendix is worm shaped vestigial structure attached to caecum of large intestine. Despite of having any important role in human body, it is very notorious site for many medical conditions most common being appendicitis which may sometimes surge for medical emergency. Appendicitis is an inflammation of the appendix, a finger-shaped pouch that projects from your colon on the lower right side of your abdomen [1]. Simply, appendectomy is surgical removal of appendix. Two types of procedure are practiced, open and laparoscopic appendectomy. The laparoscopic approach to appendectomy has gained wide acceptance over the last 15 years as a means of improved diagnostic accuracy and wound complication rate over open surgery [2].

Acute appendicitis is the most common abdominal surgical emergency, with an estimated lifetime risk of 7%-8% worldwide [3]. Appendicitis can be divided into uncomplicated and complicated appendicitis. Uncomplicated appendicitis is acute simple appendicitis without any signs of perforation, abscess, or necrosis. Complicated appendicitis is an intense inflammatory type with rapidly preceding necrosis, perforation, or both and subsequent abscess formation. Complicated appendicitis accounts for approximately 4%-25% of cases [4-6].

Emergency appendectomy (EA) has been the gold standard treatment for acute appendicitis due to the risk of its progression, such as evolution of unperforated appendicitis to perforated appendicitis [7]. However, EA for complicated appendicitis can result in excessive tissue manipulation to detach adhesions, leading to increased morbidity and risk of unnecessary expansion surgery, including ileocecal resection [6]. The standard management for these cases is conservative treatment (CT) with antibiotics and drainage for the peri-appendiceal abscess, followed by interval appendectomy (IA). The need for IA remains controversial because of the rate of recurrence and possible underlying malignancy, as well as perioperative risk [8, 9].

If intraoperative complications that cannot be handled with laparoscopy arise during laparoscopic appendectomy, conversion to open appendectomy is indicated. It is crucial to understand the circumstances in which such conversion is warranted [10, 11]. Laparoscopic technology advances and surgeons' expertise increases, many surgeons have successfully performed a multitude of laparoscopic procedures in presence of these relative contraindications. Hence the present study was conducted to assess the efficacy of laparoscopic appendectomy as well as conversion rate of laparoscopic appendectomy to open appendectomy.

Materials and Methods

A Hospital based retrospective study of 100 patients who had undergone laparoscopic appendectomy at department of general surgery was included for this study.

Methodology

Ethical approval was approved by department research unit and department of surgery, Varun Arjun Medical College & Rohilkhand Hospital, Banthra Shahjahanpur U.P India. The data of the patients were collected from the medical record section of hospital and studied. Sample size was not based on any standard sample calculation technique as all the patients who had undergone laparoscopic appendectomy. Categorical variables were presented as frequency.

Results

Out of 100 patients, Majority (61%) were between 20 years to 40 years of age followed by

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<20 and > 40 years of age (28% and 11% respectively). Most of the patients (64%) were presented with complains of pain localized in lower abdomen associated commonly with vomiting. Only 23% patients had post-operative complications, most common being pain at surgical site. The duration of hospital stay was shorter as 3 days for most of the patients (43%).

Table 1: Demographic details and duration of hospital stay

Variables		Number (n=100)
Age	<20	28
	20-40	61
	>40	11
Gender	Male	57
	Female	43
Duration of Hospital Stay	1 day	2
	2 days	22
	3 days	43
	4 days	18
	5 days	15

Table 2: Conversion rate (from laparoscopic appendectomy to open appendectomy)

		Frequency (n)
Conversion	Yes	10
	No	90
Causes	Perforation of base of appendix	4
	Uncontrolled bleeding	3
	Appendicular lump	3

Conversion rate from laparoscopic appendectomy to open appendectomy was only 10% with cause being uncontrolled bleeding, perforation of base of appendix and appendicular lump during period of this study. Causes of conversion are perforation of base of appendix-4 patients, uncontrolled bleeding (slippage of clip)-3 patients and appendicular lump-3 patients.

Discussion

Today, laparoscopic appendicectomy is considered a safe and effective method to treat appendicitis. When a patient is admitted in the hospital with appendicitis, initially antibiotics must be started and then a decision must be taken on the need for appendicectomy. A large series of laparoscopic appendicectomy for acute appendicitis initially came from Germany and was published by Pier *et al*. [12]. Laparoscopic appendicectomy has several advantages over the conventional open method of appendicectomy. In the laparoscopic method, the patient's recovery is quicker, and the patient can also return to his or her routine work at the earliest. The amount of pain that the patient may endure is far less in the laparoscopic method than in the open method. Ortega *et al*., in their study of 135 patients, showed that the pain level was much less in the laparoscopic method as compared to the open method [13]. The problem of wound infection is also much less in the laparoscopic method. Marzouk *et al*. also showed in his study that the postoperative wound infection rate was much less in the laparoscopic method [14].

The length of hospital stay is significantly reduced if a laparoscopic appendicectomy is done as compared to the open method. In their studies, Ray-Offor *et al*. [15], Rbihat *et al*. [16] and Vellani *et al*. [17], showed that the length of hospital stay was much shorter for the patients who underwent laparoscopic appendicectomy. In our study also, most of the patients who underwent laparoscopic appendicectomy had a hospital stay of 3 days or less after surgery. The present findings of rate of conversion from laparoscopic appendectomy to open appendectomy was 11.1%. Likewise, the previous study by Gupta *et al*. also showed the

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decrease trend from laparoscopic appendectomy to open appendectomy [18].

Recent studies show laparoscopic appendectomy to be as safe as open appendectomy, with similar complication rates. Although the duration of the operation is longer for the laparoscopic procedure, the hospital stay is shorter [19]. Another advantage of laparoscopy is its efficacy as a diagnostic tool for investigating suspected appendicitis. The use of laparoscopy to diagnose the cause of abdominal pain is well established [20, 21]. There is also some evidence that postoperative adhesions occur less often with the laparoscopic technique [22]. Although the cost is higher for laparoscopic appendectomy than for the conventional approach in most countries, this expense could be offset by an earlier return of patients to normal, productive lives. Furthermore, the cost could be reduced by employing reusable trocars instead of disposable trocars and by modifying the preparation technique to the base of the appendix using bipolar coagulation and forceps instead of disposable linear staplers.

Conclusion

Laparoscopic appendectomy in patients with acute appendicitis can be considered a safe procedure. There is no significant difference in postoperative complications between patients who undergo laparoscopic and open appendectomy. Although the duration of the laparoscopic operation is longer, the hospital stay is shorter, with earlier recovery.

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