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Research Article

LAPAROSCOPIC APPENDECTOMY IN COMPARISON OF OPEN APPENDECTOMY WITH RESPECT TO SURGICAL SITE INFECTION

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Abstract:

Introduction: Laparoscopic surgery has gained in popularity and found application in almost every surgical specialty. The management of many diseases has benefited from the application of the laparoscopic approach. Laparoscopic appendectomy is one such procedure increasing in popularity since initially reported by Semm in 1983. **Aims and objectives:** The basic aim of the study is to analyze laparoscopic appendectomy in comparison with open appendectomy with respect to surgical site infection. **Material and methods:** This cross-sectional study was conducted in Allama Iqbal Memorial Teaching Hospital, Sialkot during July 2019 to January 2020. This study includes 100 patients diagnosed as appendicitis and operated. Their mean age was 33.32 ± 20.80 years. OA was performed through right lower quadrant transverse muscle-splitting incision. The thread ties were placed on the base of the appendix. **Results:** Of these 100 patients, 85 had acute appendicitis and 15 appendices were perforated. There were 71 patients in the LA group and 20 in the OA group; however, 9 patients had a conversion to an open procedure. The overall SSI rate was not different between the two groups (2.8% for the OA group vs. 4.6% for the LA group, respectively, $P=0.204$), but the superficial SSI rate was significantly lower in the LA group (3.2% vs. 0.6%, $P = 0.016$). **Conclusion:** It is concluded that advantages of diagnostic laparoscopy in patients with abdominal pain, combined with the benefits of laparoscopic appendectomy, suggest that all patients with suspected appendicitis should be considered for laparoscopic appendectomy provided appropriately trained personnel and adequate equipment are available.

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INTRODUCTION:

Laparoscopic surgery has gained in popularity and found application in almost every surgical specialty. The management of many diseases has benefited from the application of the laparoscopic approach. Laparoscopic appendectomy is one such procedure increasing in popularity since initially reported by Semm in 1983. Several studies have shown the advantages of laparoscopic surgery in terms of shorter hospital stay, rapid postoperative recovery, and better pain control. However, there have been concerns about the risk of infectious complications, particularly the development of intra-abdominal abscess and superficial wound infection. This risk is significantly increased in cases of perforated appendicitis [1].

Acute appendicitis is one of the most common causes of acute abdomen in all ages. It occurs more frequently in men than in women (male/female: 1.3/1); the mean and median ages related to this pathology are 31.3 and 22 years, respectively. Open appendectomy (OA), which was first described by McBurney in 1894, is the most frequently performed emergency abdominal operation in the world. However, the use of the laparoscopic appendectomy (LA) procedure has rapidly increased since it was first described by Semm in 1984. Although LA is commonly performed for acute appendicitis, it is not always the best treatment choice [2]. Many studies comparing LA and OA with respect to treatment and follow-up have been conducted. These studies have reported less postoperative surgical-site infection, decreased need for analgesics, much greater visualization, rapid healing, shorter hospital stay times, and earlier return to normal activity (RTNA) rates associated with LA. However, because of the high costs related to endostaplers, endoclips, and knottings, LA is not the most efficient operation technique [3].

Open appendectomy (OA), which was described first by McBurney in 1894, has been accepted as the gold standard of appendectomy for around 100 years. However, since its introduction by Semm in 1983, laparoscopic appendectomy (LA) has been conducted more frequently than OA due to its advantages of being minimally invasive [4]. In particular, more attention has been paid to recent remarkable innovative development and improvement in laparoscopic equipments, instruments and techniques. Laparoscopic surgery,

as mentioned in many studies, allows for safe and aesthetic operations and can shorten the length of hospital stay, accelerate postoperative recovery and produce less pain [5].

Aims and objectives

The basic aim of the study is to analyze laparoscopic appendectomy in comparison with open appendectomy with respect to surgical site infection.

MATERIAL AND METHODS:

This cross-sectional study was conducted in Allama Iqbal Memorial Teaching Hospital, Sialkot during July 2019 to January 2020. This study includes 100 patients diagnosed as appendicitis and operated. Their mean age was 33.32 ± 20.80 years (range, 2 to 92 years). OA was performed through right lower quadrant transverse muscle-splitting incision. The thread ties were placed on the base of the appendix. The tied-off appendiceal stump was dunk in again with purse-string suture. For LA, three ports were used. One 10-mm port for laparoscope entered at the inferior margin of umbilicus with either a vertical or semicircular transverse incision. Two additional 5-mm ports entered at the left lower quadrant and at the suprapubic area. Mesoappendiceal tissue was dissected and divided with monopolar electrocautery or ultrasonic scissor. Before transection of appendix, stump was doubly ligated with endoloops as an easy, safe and cost-effective procedure.

Statistical Analysis

The data were analyzed using the Statistical Package for the Social Sciences version 20.0 for Windows (IBM Corp.; Armonk, NY, USA). The Shapiro-Wilk test was used for the number of units in cases of normal distribution of variables. When measuring the differences between the groups, the Mann-Whitney U test was used when normal distribution was absent.

RESULTS:

Of these 100 patients, 85 had acute appendicitis and 15 appendices were perforated. There were 71 patients in the LA group and 20 in the OA group; however, 9 patients had a conversion to an open procedure. The overall SSI rate was not different between the two groups (2.8% for the OA group vs. 4.6% for the LA group, respectively, $P=0.204$), but the superficial SSI rate was significantly lower in the LA group (3.2% vs. 0.6%, $P = 0.016$).

Table 01: Demographic Details and Main Outcome Measures for Laparoscopic Appendectomy and Open Appendectomy

Demographics	Laparoscopic (n = 80)	Open (n = 54)
Age	24 (range, 10 to 63)	23 (range, 7 to 63)
Sex (M:F)	28:52	35:19
Severity		
Acute appendicitis	53	32
Perforated appendix	12	15
Normal appendix	15	07
Median operating time (minutes)	51.3 (range, 35 to 100)	40.6 (range, 30 to 95)
Conversion	9	
Wound infection	1	5
Intraabdominal abscess	1	1

Table 02: Surgical site infection in patients

	OA (n = 431)	LA (n = 318)	P-value
Superficial incisional	14 (3.2)	2 (0.6)	0.016
Deep incisional	4 (0.9)	3 (0.9)	0.978
Organ/space	2 (0.5)	4 (1.3)	0.228
Overall SSI	20 (4.6) ^{a)}	9 (2.8) ^{b)}	0.204

DISCUSSION:

Appendectomy for acute appendicitis is a common emergency surgical procedure.⁸ Open appendectomy has been the gold standard treatment for acute appendicitis since the description by Mc Burney in 1894. Although appendectomy is considered a safe operation, a potential for complications exists. Most noticeable among them are wound infection, intraabdominal abscess, adhesions, bowel obstruction, and pulmonary complications from general anaesthesia [6].

Since its first description in 1983, laparoscopic appendectomy has gained in popularity with accumulating evidence demonstrating the benefits of the laparoscopic approach in terms of shorter hospital stay, more rapid recovery, and better postoperative pain control. Furthermore, laparoscopy allows a complete and thorough assessment of the abdominal cavity and increases diagnostic accuracy, particularly in females where the rates of appendectomy with normal histology have been very high [7].

The development of a postoperative intraabdominal abscess (IAA) after appendectomy is a rare but serious complication and is associated with significant morbidity. Some reports have suggested an increased risk of an intraabdominal abscess after laparoscopic appendectomy compared with open surgery, whilst others have reported the opposite [8]. An advantage of laparoscopic appendectomy has been the reduced risk of wound infection, as the inflamed appendix is dissected and removed without

direct contact with the wound, especially if an extraction bag for specimen retrieval is used [9].

This study has limitations. Patients were not randomized, and the choice of procedure was operator dependent. This introduces a bias in that the surgeons with experience and special interest in laparoscopic surgery were more likely to opt for the laparoscopic approach. Surgery was performed by varying grades of surgeons including 3 consultants and 6 specialist registrars. The incidence of intraabdominal abscess formation was low, and to detect a significant difference between the 2 groups would require a large number of patients in a randomized controlled trial. Due to other advantages of laparoscopic appendectomy, such a trial is unlikely [10].

CONCLUSION:

It is concluded that advantages of diagnostic laparoscopy in patients with abdominal pain, combined with the benefits of laparoscopic appendectomy, suggest that all patients with suspected appendicitis should be considered for laparoscopic appendectomy provided appropriately trained personnel and adequate equipment are available.

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