Role of Laparoscopy in Appendectomy versus Open Technique: Comparative Prospective Study

Thesis

For Partial Fulfilment Of Master Degree In General Surgery

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List of Abbreviations

Abb.	Full term
CRP	*C-reactive Protein*
EA	*Epiploic Appendagitis*
GALT	*Gut-associated Lymphoid Tissue*
IgA	*Immunoglobulin A*
LA	*Laparoscopic Appendectomy*
VLA	*Video Laparoscopic Approach*
WBC	*White Blood Cell*

Abstract

The results showed that the operative time was significantly longer in the laparoscopic group (Group B) with mean time 85.3 minutes than open group (Group A) with mean time 60.2, *P* value was 0.001, also the overall post-operative complications showed no significant difference between the 2 groups with *PV*=0.127.However, post-operative wound infection was significantly higher in the open group (A) than the laparoscopic group (B), (25% infected in open cases and only 5% infected in laparoscopic cases) with *PV*=0.031.

While there was no significant difference between Group A and Group B regarding pelvic abscess, fecal fistula and Wound dehiscence.

Post-operative hospital stay, and time needed to return to normal daily activities were significantly lower in the laparoscopic group (B) than in the open group (A) with PV=0.002and 0.001 respectively.

Post-operative analgesia needed was significantly lower in the laparoscopic group (B) than in the open group (A) with PV=0.000.

There was no significant difference between both groups regarding post-operative time needed to start oral fluids with PV=0.146.

Keywords: C-reactive Protein - Epiploic Appendagitis - Immunoglobulin A

INTRODUCTION

The appendix is a small, worm-like, tubular appendage attached to the cecum of the colon. Appendicitis occurs when the appendix becomes blocked, and bacteria invade and infect the wall of the appendix ***(Saia et al., 2012).*** Appendectomy is one of the commonly performed procedures in General surgery. The incidence rate of appendicitis is about 7%.

The classic symptoms of appendicitis include: dull pain near the umbilicus or the upper abdomen that becomes sharp as it moves to the lower right abdomen, this is usually the first sign. Loss of appetite, nausea and/or vomiting soon after abdominal pain begins, low grade fever, Inability to pass gas, a sense that you might feel better after passing stool. Appendicitis signs include: tenderness and rebound tenderness over right lower quadrant ***(Stechman et al., 2009; Bregendahl et al., 2013; Tiwari et al., 2011).***

McBurney described the operative technique for right iliac fossa pain using Gridiron incision in 1894. This remained the technique for appendectomy and did not change much until almost a century later, when in 1983; Semm described the first laparoscopic appendectomy. Laparoscopic appendectomy for suspected appendicitis is considered safe and effective. It has gained popularity in recent years and has become one of the most widely performed procedures using the laparoscope globally. Many surgeons have demonstrated that a video

laparoscopic approach (VLA) to acute appendicitis is possible during several stages of the inflammatory process, depending upon the surgeon's experience ***(Swank et al., 2011; Von Holzen et al., 2012).***

We conducted this comparitive prospective study to compare the results of open appendectomy with laparoscopic appendectomy in terms of postoperative pain, rate of wound infection and hospital stay, reflecting on early return to work, to justify the increase in apparent cost of procedure.

Aim of the Work

The aim of this study was to compare the effectiveness and safety and outcome of laparoscopic versus conventional "open" appendectomy in the treatment of acute appendicitis.

Chapter 1
ANATOMY AND EMBRYOLOGY

1. Historical Background

The appendix was probably first noted as early as the Egyptian civilization (3000 BC). During the mummification process, abdominal parts were removed and placed in Canopic jars with inscriptions describing the contents. When these jars were uncovered, inscriptions referring to the "worm of the intestine" were discovered ***(Herrinton, 1991).***

Aristotle and Galen did not identify the appendix because they both dissected lower animals, which do not have appendices ***(Herrinton, 1991).***

Credit for performance of the first appendectomy goes to Claudius Amyand, a surgeon at St. George's Hospital in London in 1736.The first published account of appendectomy for appendicitis was by Krönlein in 1886. However, this patient died 2 days postoperatively. Fergus, in Canada, performed the first elective appendectomy in 1883 ***(Ellis et al., 1997).***

2. Embryology and development of appendix

The appendix and the caecum develop as outpouchings of the caudal limb of the midgut loop in the sixth week of human development. The appendix becomes distinguishable by its failure to enlarge as fast as the proximal caecum. This difference in growth rate continues into postnatal life. At birth

,the appendix is located at tip of the caecum,however unequal elongation of the lateral wall of caecum,the adult appendix originate from posteromedial wall of caecum,caudal to iliocecal valve(Soybel et al.,2000)

Congenital Anomalies:

Appendiceal variations are few, and are all rare.

- Absence of the Appendix: Congenital absence of the appendix is extremely rare ***(Hei, 2003).***
- Ectopic Appendix:

In cases of malrotation of the bowel, where the caecum fails to descend to its normal position, the appendix may be found in the epigastrium, abutting against the stomach or beneath the right lobe of the liver.In this situation, the symptoms and signs of acute appendicitis may mimic acute cholecystitis ***(Ellis et al., 1997).***

- ***Left-Sided Appendix:***

1. Situs inversus viscerum.
2. Non rotation of the intestine.
3. Wandering caecum with a long mesentery.
4. Excessively long appendix crossing the midline ***(Yang et al., 2011).***

- Duplication of the Appendix: A transient, appendix like structure, appearing during week 5, has been described. It has been suggested that persistence of this structure may explain certain forms of duplication ***(Williams et al., 1994).***

Types of duplication: Duplication of the appendix is an anomaly of extreme rarity and fewer than 100 cases have been reported.

Khanna (1983) and Wallbridge (1962), classified duplication of the appendix into three types:

- Type A: Partial duplication on single caecum.
- Type B: Two completely separated appendices on single cecum.
- Type C: Double caecum each bears appendix ***(Kim and McClenathan, 2001).***

○ Congenital Appendiceal Diverticula ***(Skandalakis et al., 2004).***

○ Heterotopic Mucosa in the Appendix ***(Haque et al., 1996).***

3. Anatomical description

In humans, the vermiform appendix is a small, finger sized structure, arising from the posteromedial caecal wall 1.7-2.5 cm below and behind the iliocecal valve ***(Blakemore et al., 2001).***