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Research Article

**OUT COMES OF LAPAROSCOPIC APPENDECTOMY VERSUS
OPEN APPENDECTOMY IN EMERGENCY-A RANDOMIZED
CONTROLLED CLINICAL TRIAL****Dr. Zardad Khan¹, Azhar Hussain²**¹ Assistant Professor Surgery Divisional Head Quarter Teaching Hospital, Mirpur AK, ² Ameer ud Din Medical College Lahore.**Article Received:** August 2019**Accepted:** September 2019**Published:** October 2019**Abstract:**

Background: Acute inflammation of appendix, known as appendicitis can be due to infection or obstruction of appendix by stool, foreign bodies or cancer. The etiology of appendicitis is multifactorial and it is the most common presentation of acute abdomen.

Aim: The aim of this research is to compare the effectiveness and safety of laparoscopic and conventional open appendectomy in the treatment of acute appendicitis in local tertiary care settings on Pakistani population by comparing data pertaining to the two procedures especially with regards to post op pain, hospital stay duration, wound infection and cost effectiveness.

Methods: After the approval from Ethical review committee of Lahore General Hospital all cases of acute appendicitis were identified for this randomized controlled clinical trial as per the inclusion exclusion criteria. After written informed consent, appendectomy were done patient and patients were interviewed. Postoperative pain were measured by Numerical Rating Scale (NRS) in which the value 0 indicate no pain at all and 10 is equal the worst pain ever felt. Surgical record were used for preoperative and postoperative treatment, procedure done, and duration of hospital stay. Alvarado scoring system of clinical diagnosis for acute appendicitis

Results: We studied on 600 patients. 398(59.2%) were female, 202(40.7%) were male. 93.1% were married and 6.9% were unmarried. The number of laborers was 56.2%, housewives were 37.9% and government employed working ladies were 6%. On screening through ELISA or PCR, out of 600 subjects, only 4 (0.67%) were positive for hepatitis C infection. During study period, total 763 appendectomy were performed, of which 448 were open and 315 were laparoscopic. The post-operative hospital stay was 4.4 days in OA and 3.2 in LA (OR-0.47, CI95%).

Conclusion: Laparoscopic appendectomy is better than open appendectomy with regards to post op pain, hospital stay duration and wound infection.

Keywords: Laparoscopic appendectomy, open appendectomy, emergency.

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INTRODUCTION:

Acute inflammation of appendix, known as appendicitis [1] can be due to infection or obstruction of appendix by stool, foreign bodies or cancer [2]. The etiology of appendicitis is multifactorial and it is the most common presentation of acute abdomen. In United States life time risks of acute appendicitis is 8.6 percent in males and 6.7 percent in females hence it is regarded as one the most compelling cause of acute abdomen and a very common surgical emergency [3]. First case of appendectomy was recorded in 1735 and since then the procedure has been modernized [4]. Like all other procedures efforts are being made to make this procedure as minimally invasive as possible. In this regard, the advent of laparoscopic appendectomy has proved to be of focal importance in this journey to make the treatment of appendicitis minimally invasive.

Although open appendectomy is considered as the gold standard for treatment of appendicitis [5] but benefits of laparoscopic appendectomy cannot be undermined or ignored. Over the years many studies have been conducted to compare the various aspects of open appendectomy with those of laparoscopic appendectomy. Studies conducted in university of Catania Italy [6], Duke University USA [7], the gall bladder and laparoscopic center of surgery in Miami [8] all clearly indicate a superior outcome of laparoscopic procedure in comparison to open appendectomy especially with regards to post op pain, hospital stay, hospital expenses, wound infection. However, these studies also indicate a greater cost in case of laparoscopic appendectomy. Despite all these factors laparoscopic procedure has failed to obtain universal approval especially in Pakistan with open appendectomy being the main stay procedure with regards to acute appendicitis.

The aim of this research is to compare the effectiveness and safety of laparoscopic and conventional open appendectomy in the treatment of acute appendicitis in local tertiary care settings on Pakistani population by comparing data pertaining to the two procedures especially with regards to post op pain, hospital stay duration, wound infection and cost effectiveness. Our study findings will assess the applicability of laparoscopic appendectomy in public sector hospitals by establishing its importance in improving quality of life and decreasing post-operative complications based on our own experience on Pakistani population as most of the studies that have been carried out on this very topic are of western origin. As we know that there are many challenges regarding quality of life and patients care in local setup

as comparison to that of western setup. As laparoscopic surgery is not available in all the tertiary care hospitals of public sector and health authorities are trying to establish it, this gives another importance to our study in local context.

OBJECTIVES:

The objective of this research is to compare open appendectomy with laparoscopic appendectomy in patients with acute appendicitis with regards to:

- Postoperative pain
- Duration of hospital stay
- Wound infection
- Overall cost effective of procedure

HYPOTHESIS:

Laparoscopic appendectomy is better than open appendectomy with regards to post op pain, hospital stay duration and wound infection.

METHODS:**OPERATIONAL DEFINITION:**

- **APPENDICITIS:** Inflammation of appendix [1].
- **APPEDECTOMY:** Surgical removal of appendix [1].
- **OPEN APPEDECTOMY:** Removal of appendix through an incision in right lower abdominal wall [1].
- **LAPAROSCOPIC APPEDECTOMY:** Minimally invasive technique to remove appendix using three small incisions while watching an enlarged image of the internal organs on a screen.
- **POSTOPERATIVE PAIN:** Condition of tissue injury together with muscle spasm following surgery causing stimulation of pain fibers [9].
- **HOSPITAL STAY DURATION:** The amount of time in days that a patient spends in a hospital following surgery prior to uncomplicated discharge.
- **SURGICAL WOUND INFECTION:** Infection that takes place at site of surgery including deep cavity wound infections within 30 days of surgery. It involves purulent drainage with or without laboratory confirmation from site of infection [10].

RESEARCH METHODOLOGY:

- **SETTING:** The study were conducted in surgical unit 1 Lahore general hospital.
- **STUDY POPULATION:** The study includes all those patients suffering from acute appendicitis
- **STUDY DURATION:** For the period of six month.

- **STUDY DESIGN:** This is a prospective randomized controlled trial.
- **SAMPLING TECHNIQUE:** Two groups were drawn by random sampling as per inclusion exclusion criteria. One group will undergo open appendectomy and one will undergo laparoscopic appendectomy.
- **SAMPLE SIZE:** A total of 60 participants were included in the study of which 30 will undergo open appendectomy and 30 will undergo laparoscopic appendectomy. The patients shall be put in their relevant groups as per stratified random sampling technique.

INCLUSION CRITERIA:

1. All diagnosed cases of acute appendicitis that have undergone appendectomy in emergency operation theater.
2. Age above 12 to 60 years.
3. Alvarado scoring system of clinical diagnosis for acute appendicitis were used by using elements from the person's history, the physical examination and from laboratory tests if score were 7 or above:
 - Abdominal pain that migrates to the right iliac fossa
 - Anorexia (loss of appetite) or ketones in the urine
 - Nausea or vomiting
 - Tenderness in the right iliac fossa
 - Rebound tenderness
 - Fever of 37.3 °C or more
 - Leukocytosis, or more than 10,000 white blood cells per microliter in the serum
 - Neutrophilia or an increase in the percentage of neutrophils in the serum white blood cell count.

EXCLUSION CRITERIA:

1. Any case operated in any other operation theater or ward will not be included in the study.
2. Only simple acute appendicitis were included in the study.
3. No cases of perforated appendix or appendicular mass will not be included in the study.
4. Any case of conversion of laparoscopic appendectomy to open appendectomy will not be included in the study as well.
5. Patient with co morbidities should be excluded.

DATA COLLECTION TOOL: Structured questionnaires shall be utilized for data collection.

DATA COLLECTION PROCEDURE:

After the approval from Ethical review committee of Lahore General Hospital all cases of acute appendicitis were identified as per the inclusion exclusion criteria. After written informed consent, appendectomy were done patient and patients were interviewed. Postoperative pain were measured by Numerical Rating Scale (NRS) in which the value 0 indicate no pain at all and 10 is equal the worst pain ever felt. Surgical record were used for preoperative and postoperative treatment, procedure done, and duration of hospital stay. Postoperative mental status were evaluated by Hamilton rating scale for depression (attached). All prospective data were recorded on a data collection form (attached) which were used to estimate the cost effectiveness of the procedure.

DATA ANALYSIS:

SPSS windows version 22 were used to analyze the data. p value of less than 0.05 were considered statically significant. We will use student t-test to relate arithmetic means and parameters and Chi square test for categorical variables and Odds Ratio were calculated for different adverse events and complications.

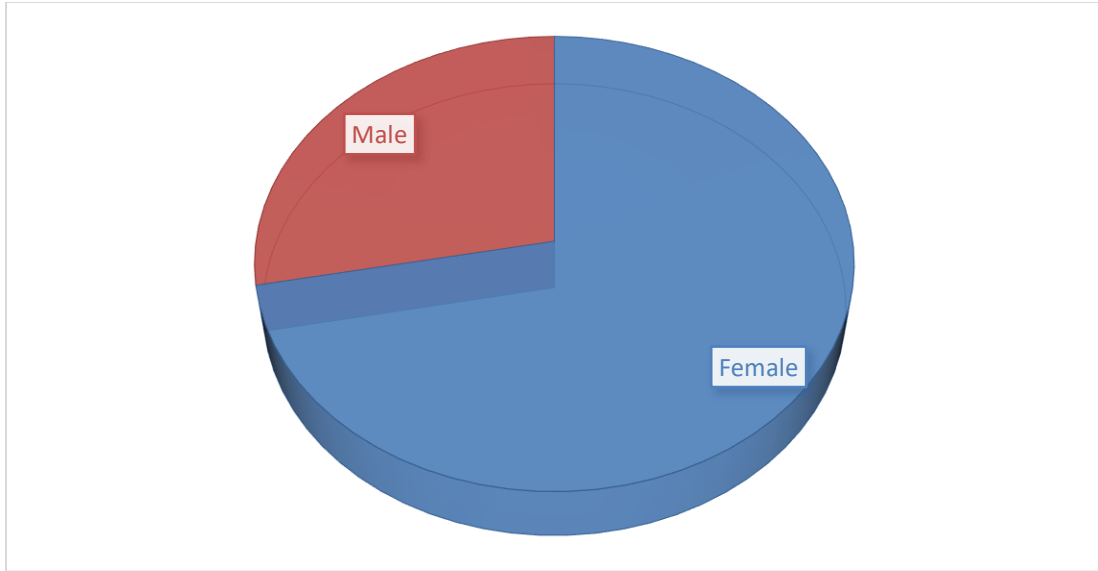
Frequencies were used to calculate for categorical variables like post op pain, hospital stay and wound infection and an effective comparison were established between the two procedures.

ETHICAL CONSIDERATION:

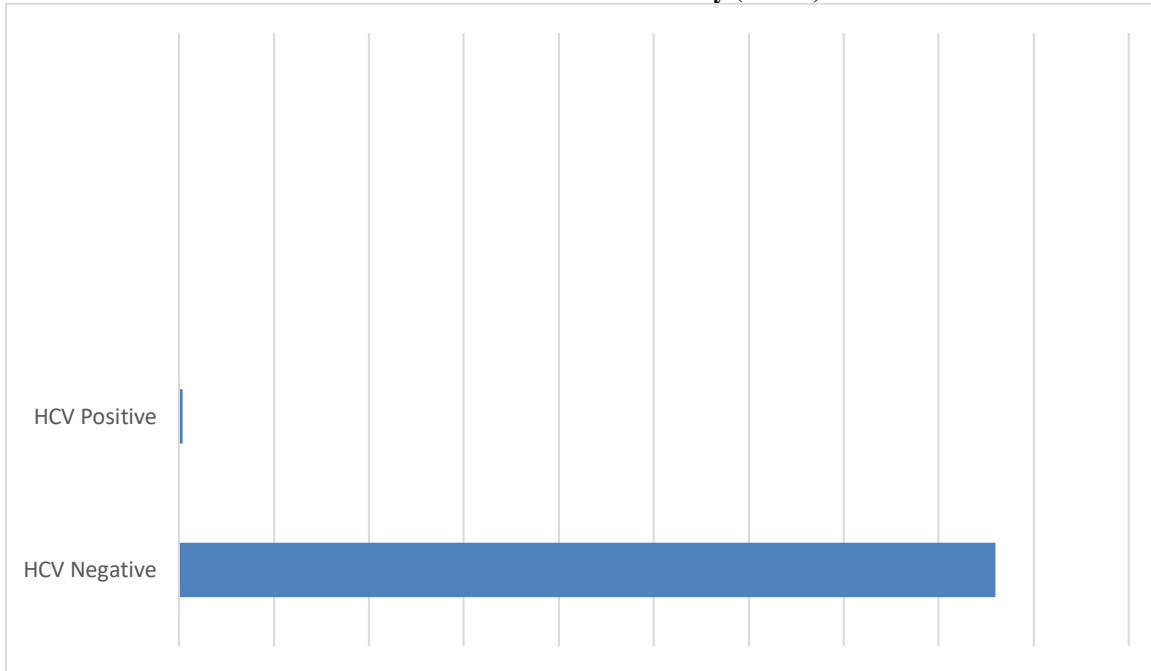
After the permission of the ethical review committee, the potential participants of the study who met the selection criteria were included in the study. The identity of any of the participants will not be revealed to any irrelevant individual.

RESULTS:

We studied on 600 patients. 398(59.2%) were female, 202(40.7%) were male Pie.1. 93.1% were married and 6.9% were unmarried. The number of laborers was 56.2%, housewives were 37.9% and government employed working ladies were 6%. On screening through ELISA or PCR, out of 600 subjects, only 4 (0.67%) were positive for hepatitis C infection Bar.1. During study period, total 600 appendectomy were performed, of which 300 were open and 300 were laparoscopic. The post-operative hospital stay was 4.4 days in OA and 3.2 in LA (OR-0.47, CI95%) Table 1.



Pie.1.Gender distribution of study (n=600)



Bar.1.HCV status distribution of study (n=600)

Table.1.Outcomes of laparoscopic appendectomy versus open appendectomy in emergency (n=600; CI 95%)

Outcome	LA	OA	Mean(OR)
	<i>Undergraduate</i>		
Operating time(min)	34±6	38 ±6	-7(0.77)
Surgical wound infections	23	50 ±6	32(1.89)
Pain score	2	7	+3.5(4.07)
Hospital Stay duration (days)	3.2	4.8	-1.2 (0.47)
Resumption of food intake (hours)	39	69	-31 (2.1)

DISCUSSION:

First case of appendectomy was recorded in 1735 and since then the procedure has been modernized [4]. Like all other procedures efforts are being made to make this procedure as minimally invasive as possible. In this regard, the advent of laparoscopic appendectomy has proved to be of focal importance in this journey to make the treatment of appendicitis minimally invasive.

A prospective randomized trial was published in the literature, which concluded that there is no significant difference in outcome between suction and irrigation combined and suction alone during LA in case of perforated appendicitis. In this study the incidence of residual abscess was found to be same in both group with perforated appendicitis. Duration of hospital stay was also not different [11-12].

Although open appendectomy is considered as the gold standard for treatment of appendicitis but benefits of laparoscopic appendectomy cannot be undermined or ignored. Over the years many studies have been conducted to compare the various aspects of open appendectomy with those of laparoscopic appendectomy. Studies conducted in university of Catania Italy, Duke University USA, the gall bladder and laparoscopic center of surgery in Miami all clearly indicate a superior outcome of laparoscopic procedure in comparison to open appendectomy especially with regards to post op pain, hospital stay, hospital expenses, wound infection.

During study period, total 763 appendectomy were performed, of which 448 were open and 315 were laparoscopic. The post-operative hospital stay was 4.4 days in OA and 3.2 in LA (OR-0.47, CI95%). As we know that there are many challenges regarding quality of life and patients care in local setup as comparison to that of western setup. As laparoscopic surgery is not available in all the tertiary care hospitals of public sector and health authorities are trying to establish it, this gives another importance to our study in local context. Laparoscopic appendectomy is way better than OA in the treatment of acute appendicitis in local tertiary care settings on Pakistani population with regards to post op pain, hospital stay duration, wound infection and cost effectiveness [13-14].

CONCLUSION:

Laparoscopic appendectomy is better than open appendectomy with regards to post op pain, hospital stay duration and wound infection.

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