

Outcome Analysis of Laparoscopic Sutured Appendectomy versus Sutureless Appendectomy using Harmonic Scalpel

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Abstract: Background: Appendicitis is an inflammation of appendix that develops most common in adolescents and young adults. Acute appendicitis is the most common cause of 'acute abdomen' in young adults. Appendectomy is the most frequently performed emergency abdominal operation either open or laparoscopic methods. Objective: To compare the outcome of laparoscopic sutured appendectomy versus sutureless appendectomy using harmonic scalpel. Material and Method: Study was conducted from January 2021 to July 2022 in the department of general surgery of sarojni noidu medical college, Agra. All patients who are above 18 years with primary uncomplicated acute appendicitis were included in the study after taking prior informed consent. Total numbers of patients included were 108. Patients were divided into two groups randomly: Group A: It included 54 patients in whom laparoscopic appendectomy done by using suture. Group B: It included 54 patients in whom laparoscopic appendectomy was done by using sutureless harmonic scalpel. Conclusion: Laparoscopic sutureless appendectomy using harmonic scalpel had better outcome than laparoscopic sutured appendectomy.

Keywords: Acute appendicitis, Harmonic scalpel

1. Introduction

Appendicitis is an inflammation of the vermiform appendix. It is mostly caused by obstruction of the lumen due to hyperplasia of the lymphoid follicles at younger age or by obstruction of the lumen by faecoliths in older patients. Appendicitis is the most common surgical abdominal emergency. The lifetime risk of developing appendicitis is 8.6% for males and 6.7% for females, with the highest incidence in the second and third decades. The diagnosis is mainly clinical but appendicitis can mimic a variety of acute medical and surgical abdomino-thoracic conditions like acute mesenteric adenitis, gastroenteritis, testicular torsion, acute epididymitis, Meckel's diverticulitis, twisted ovarian cyst and lower lobe pneumonia etc. Early diagnosis of appendicitis is important to prevent morbidity and mortality due to its complications like abscess and perforation leading to peritonitis. Appendectomy is one of the commonly performed emergency operation worldwide. Since its introduction in 1894 by McBurney, Open appendectomy is gold standard procedure for acute appendicitis. Semm in 1983 first described laparoscopic appendectomy. Laparoscopic appendectomy (minimally invasive technique) was quickly adapted for appendectomy. The harmonic scalpel has been used successfully in a number of open and laparoscopic procedures. The advantages of this technology include minimal thermal spread, decreased tissue charring and smoke formation when compared with traditional electrosurgical instruments, and no risk of electrical injury due to the absence of electrical current within the patient. It is also a versatile instrument, allowing the surgeon to dissect, cut, and coagulate using one instrument.

2. Material and Methods

Prospective study was done among patients of acute uncomplicated appendicitis admitted through outpatient department and emergency department from January 2021 to

July 2022 in the department of general surgery Sarojni Medical College Agra. All patients in the department of surgery with a minimum follow up period of 6 months. The sample size of approximately 108 patients was taken which was further segregated randomly into two groups of 54 patients each.

Group A: It included 54 patients in whom laparoscopic appendectomy done by using sutured

Group B: It included 54 patients in whom laparoscopic appendectomy was done Sutureless using harmonic scalpel.

Inclusion Criteria:

Patients fulfilling following criteria were included in this study.

- 1) Patient should be healthy. (American Society of Anesthesiology)
- 2) Patient with simple, uncomplicated appendicitis
- 3) Patient planned for interval appendectomy.

Exclusion Criteria:

Patients fulfilling any of the following criteria were excluded from the study.

- 1) Appendicular lump
- 2) Appendicular abscess
- 3) Appendicular perforation

After taking informed and written consent, spinal anaesthesia was given.

To compare the outcome of laparoscopic sutured appendectomy versus sutureless appendectomy by using harmonic scalpel in terms of:

- 1) Length of surgery
- 2) Post operative complications using The Clavien-Dindo Classification
- 3) Cost efficacy

3. Results

The study was conducted in Department of General Surgery, Sarojni Naidu Medical College, for a period of 18 months from January 2021 to July 2022.

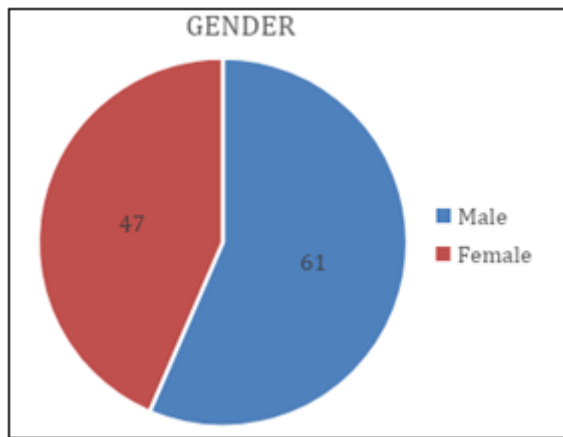
Total 108 appendectomies were performed by harmonic during this period out of which 88 were done as elective and 20 were done as emergencies case. Statistical analysis was done by Chi-square test with Yates correction

Gender Distribution

Out of 108 patients 61 (56.48%) patients were male and rest of 47(43.52%) patients were female. Appendectomies was done in all patient by harmonics

Table 1: Gender

	Harmonic	% Age
Male	61	56.48
Female	47	43.52
Total	108	100



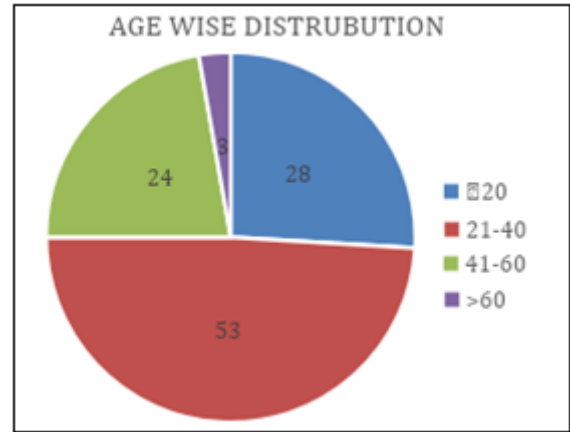
Age Distribution

The maximum age was 65 years and the minimum age was 12 years. The mean age and standard deviation (SD) were 31.22±13.35 years.

Maximum number of patients (53 patients) belonged to age group 21-40 years. Minimum number of patients (3 patients) was in age group >60 years.

Table 2: Age Wise Distribution

Age groups(yrs)	No.	%
≤20	28	25.93
21-40	53	49.07
41-60	24	22.22
>60	3	2.78
Total	108	100.00

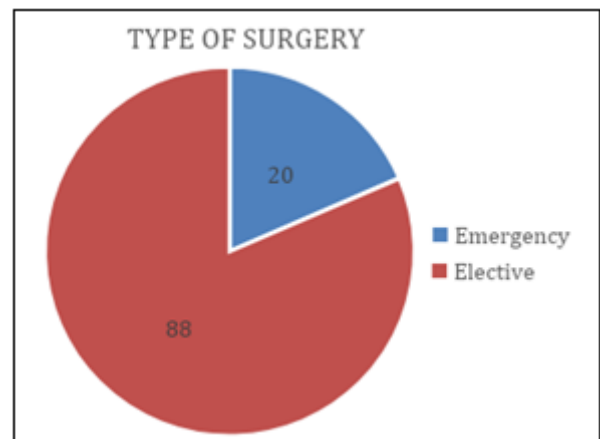


Type of surgery

Out of 108 appendectomies were performed by harmonic during this period out of which 88 were done as elective and 20 were done as emergencies case.

Table 3: Type of Surgery

Type	Case (Harmonic)	% Age
Emergency	20	18.52
Elective	88	81.48
Total	108	100

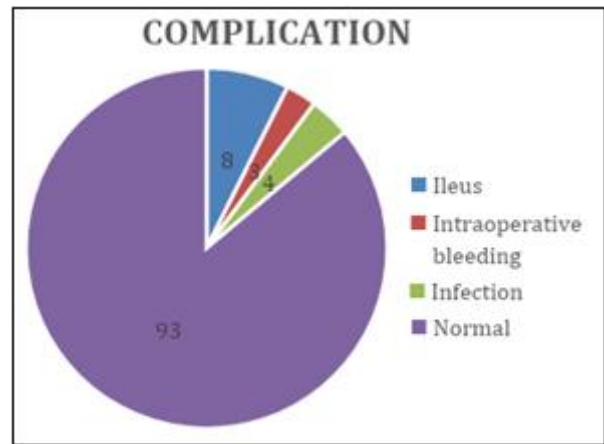
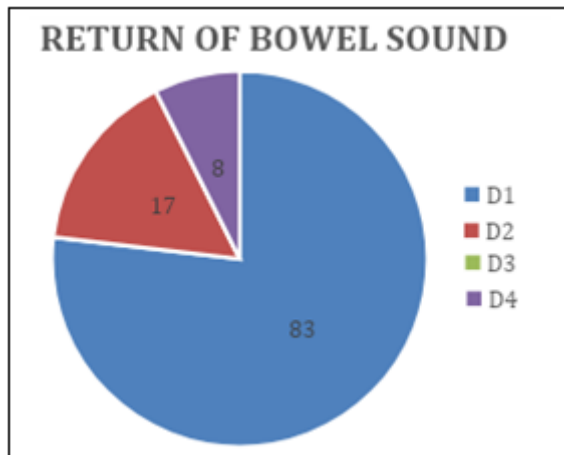


Return of Bowel Sound

Out of 108 appendectomies done by harmonics return of bowel sound occurs on day 1(POD1) in 83 cases (76.85%) and 17 cases it occurs on day 2(POD2). We did not consider return of bowel sound on day 3 as we consider it as post operative paralytic ileus. Therefore we check bowel sound on post op day 4 and it occur in 8(07.41%) cases, and we allow oral soft diet on next day of return of bowel sound and discharge the patient on same day in evening.

Table 4: Return of B.S.

Return of B.S.	Harmonic	% Age
D1	83	76.85
D2	17	15.74
D3	0	0
D4	8	7.41

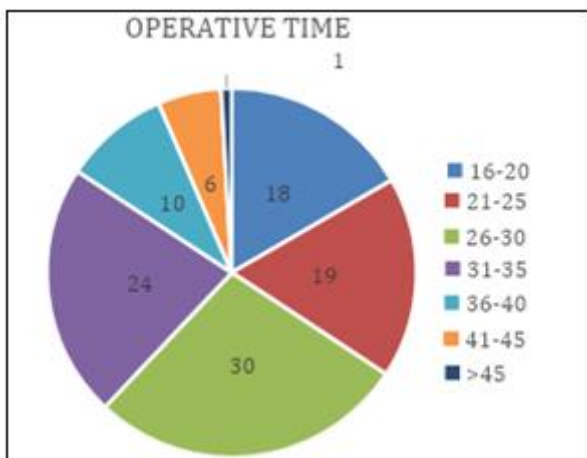


Operative Time

Mean operative time for 108 appendectomies by harmonics was 28.463±7.19 min and maximum and minimum time taken was 48 min and 17 minute.

Table 5: Operative Time

Operation Time in Minute	Frequency of Patients(Harmonic)	Percentage of Patients (%)
16-20	18	16.7
21-25	19	17.6
26-30	30	27.8
31-35	24	22.2
36-40	10	09.2
41-45	6	05.6
>45	1	0.9
TOTAL	108	100



Complication

Complication include in both per operative and post operative periods. Out of 108 appendectomies no complication occurs in 93cases. Per operatively haemostatic clip was used in 3(2.8%) cases and in post op period surgical site infection occur in 4(3.7%) case and post operative ileus occur in 8(7.4%) cases

Table 6: Complication

Complication	Case(Harmonic)	%
Ileus	8	7.4
Intraoperative bleeding	3	2.8
Infection	4	3.7
Normal	93	86.1
Total	108	100

4. Conclusion

Data from literature and our results indicate that the management of appendicular base with harmonics during laparoscopic appendectomy appears to be simple, safe alternative. It is associated with low complication rate. Because of these advantages laparoscopic appendectomy by harmonics is most frequently used in our department. Our techniques of the appendicular stump closure by harmonic scalpel is effective and safe.

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