



# LAPAROSCOPIC APPENDECTOMY; CLIP CLOSURE OF APPENDICULAR BASE DURING LAPAROSCOPIC APPENDECTOMY: THE MAYO HOSPITAL LAHORE EXPERIENCE.

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**ABSTRACT... Introduction:** Appendicitis is a condition characterized by inflammation of the appendix and is considered to be the most common emergency encountered in surgical practice. Compared with the open technique for appendectomy, laparoscopic appendectomy has less operative time, hospital stay and rate of complications and has been deemed as a safe and feasible procedure for the treatment of acute appendicitis. The use of endoclips for stump closure has been described to be comparable to other existing techniques with regards to clinical outcomes. However, controversies exist in literature regarding operative time with endoclip application. **Objectives:** To assess mean operative time for laparoscopic appendectomy using specially designed Double Shankend (DS) endoclips and assessing advantages in the form of better cosmesis, less pain. **Study Design:** Cross sectional exploratory study using non-probability sampling technique. **Setting:** West Surgical Ward of Mayo Hospital Lahore. **Period:** Period of 9 months from April 2014 through to December 2014. **Materials and Methods:** 120 successive patients fulfilling inclusion criteria were enrolled in the study. Clinical data with respect to their demographic profile (age and sex) were recorded. Laparoscopic Appendectomy was performed or supervised by one consultant. Quantitative variables such as age and operative time was analyzed and mean and standard deviation were calculated. **Results:** Our study results showed the mean age of the patients to be  $25.84 \pm 8.09$  years. There were 63.3% males whereas 36.7% were females. The mean operative time of the patients was noted to be  $0.99 \pm 0.39$  hours. **Conclusions:** The study results lend credence to the fact that Laparoscopic Appendectomy with endoclips is a safe, effective technique and has an admissible short operative time which when combined with better cosmesis, lesser pain and faster recovery, give it validity and acceptability. Our results generated for the local population will influence our management strategy for acute appendicitis in our set up.

**Key words:** Acute Appendicitis, Appendectomy, Endoclips, Laparoscopic, Operative Time.

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## INTRODUCTION

The presentation of patients with acute appendicitis is a very frequent occurrence in the career of a surgeon, may it be at the level of internship, residency or private practice. Hence, appendectomy has become the most frequent surgery to be carried out in a surgical setting with figures described to be more than 130,000 per year in Germany and majority of these being performed laparoscopically.<sup>1</sup>

For more than a century, the technique described by Mcburney for treatment of acute appendicitis was prevalent all over the world till until recently

when a laparoscopic approach was devised and carried out successfully by Kurt Semm.<sup>2</sup> Subsequently, an influx of data began pooling up comparing the two methods and we have now, several studies and even a systematic review with meta-analysis describing both the techniques to be equally effective.<sup>3,4</sup> With these facts, the laparoscopic approach proved to be favorable as it offered lower rates of wound infection, a shorter hospital stay, faster recovery and return to normal everyday routine. Critics of the procedure have also some valid points that need attending in the form of longer operating times and hence, longer anesthesia, and higher costs. A major factor in

contributing for higher costs is the technique used for closure of stump in Laparoscopic Appendectomy (LA). Different techniques have been described in literature including Endoloop, endoscopic linear cutting staplers, harmonic scalpel, LigaSure system and Endoclip application.<sup>5-7</sup> Clips ranging from titanium clips and polymeric non absorbable clips have been used. Local data is also available for using the Liga Clip Extra by Ethicon for stump closure.<sup>8</sup> We have used a specially designed titanium double-shanked (DS-Clip) clip by Aesculap Division Bbraun for our study to determine its safety, feasibility and its impact on operative time for the technique of Laparoscopic Appendectomy.

### MATERIALS AND METHODS

A cross sectional exploratory study was carried out using non probability sampling technique. The study spanned from April, 2014 through to December, 2014 at West Surgical Ward of Mayo Hospital Lahore. A total of 120 clinically suspected cases of acute appendicitis with an Alvorado score >6 and aged between 13-40 years were enrolled in the study. Patients with a palpable mass in the right lower quadrant or presentation with perforated appendix and peritonitis were excluded.

Patients fulfilling inclusion criteria were admitted from the emergency department of Mayo Hospital, Lahore. A written informed consent was taken. Clinical data with respect to their demographic profile (age and sex) were recorded. Baseline investigations were carried out. Preoperative antibiotic prophylaxis comprising of intravenous ceftriaxone 1g and metronidazole 500mg was given at the time of incision. All patients were operated under general endotracheal anesthesia.

The procedure was carried out in a standard fashion. A 1.5 cm supraumbilical curvilinear incision was made and CO<sub>2</sub> insufflated into the abdominal cavity with the help of Veress needle before introducing the 10mm camera port. The patient was then placed into a steep Trendelenburg position and two 5mm working ports inserted in the suprapubic and left iliac fossa respectively. Appendix was located by following the taenia coli

down to its confluence at the base of the cecum. Harmonic scalpel was used for mesoappendix transection and skeletonizing the appendix. The DS Clips were then introduced with their applicator under direct vision and ligation of the base carried out before dividing the stump which was removed from the cavity using an endobag and sent for histopathology. Operative time was noted with the use of the DS Clips from the initial skin incision upto skin closure.

### RESULTS

In this study, a total of 120 patients were enrolled. The mean age of the patients was noted to be  $25.84 \pm 8.09$  years with minimum and maximum ages of 13 & 40 years respectively out of which 63.33% patients were males whereas 36.67% patients were females.

The breakdown of the population statistics revealed that 82 cases had age <30 years in which 51 patients were males and 31 patients were females. Similarly, 38 cases had age >30 years in which 25 were males and 13 were females.

The mean operative time of the procedure was noted as  $0.99 \pm 0.39$  hours with minimum and maximum operative time of 0.40 and 1.70 hours respectively (Table-I). It was  $1.00 \pm 0.40$  hours in male patients while the mean operative time in female patients was  $0.96 \pm 0.38$  hours. Statistically there was insignificant difference between gender and operative time i.e. p-value=0.599 (Table-II). Patients undergoing surgery described good pain control and better cosmetic advantage which come with laparoscopy surgery.

Operative Time (hours)	n	120
	Mean	0.99
	SD	0.39
	Minimum	0.40
	Maximum	1.70

**Table-I. Mean operative time**

		Sex		P Value
		Male	Female	
Operative time (hours)	n	76	44	0.599
	Mean	1.00	0.96	
	SD	0.40	0.38	

**Table-II. Operative time with respect to gender**

## DISCUSSION

Acute appendicitis is the most common surgical emergency. Laparoscopy is the gold standard approach in many surgical procedures: This consideration is still controversial with respect to appendectomy. However, with emerging trends in the fields of laparo-endoscopic surgery, its safety and effectiveness has been given due credit.<sup>9</sup> Mashat et al concluded in their study that LA is a safe and an effective procedure in acute appendicitis. They demonstrated their results of study in terms of mean operative time, conversion to Open Appendectomy, mean hospital stay and complications without mortality and described them to be comparable to those quoted in international series and hence, recommended LA to be the first line of treatment for all patients with appendicitis.<sup>10</sup>

Various techniques have been evaluated in different studies including the use of endoloops, staplers, endoclips and harmonic scalpel to cater to appendix stump closure during LA. The use of endoclips seems charming as it gives an easier approach to the technique and is described by Rickert et al to have comparable outcomes with other techniques.<sup>6</sup>

On this note, the technique of appendiceal stump closure by metal endoclip was evaluated in our study with the help of various clinical studies<sup>11,12</sup> which established the feasibility of using clips in patients with uncomplicated appendicitis.

A meta-analysis that compiled 11 studies demonstrated that from the 2175 operated patients with complicated acute appendicitis, 92 (4.2%) had infection related to the wound.<sup>13</sup> Katkhouda et al reduced its frequency from 2.4% to 0.4%, with the implementation of a laparoscopic approach and some simple per-operative measures such as exposure of the appendicular base; concern with fragments, gaps and the appendicolith; inspection, irrigation and aspiration of the bottom of the peritoneal cavity; and the use of endobags.<sup>14</sup>

The results concerning age in our study showed that the mean age of the patients was  $25.84 \pm 8.09$

years with minimum and maximum ages of 13 & 40 years respectively. The reported mean operative time in various studies ranged from 28 minutes (0.46 hours) to 103.03 minutes (1.72 hours).<sup>15,16</sup> The operative time which was found to be  $54 \pm 20.75$  min i.e.  $0.90 \pm 0.35$  hrs by Rickert et al which when compared to other studies by Ates et al ( $41.27 \pm 12.2$  min i.e.  $0.69 \pm 0.20$  hrs) as well as local data ( $39.75 \pm 25.75$  min i.e.  $0.66 \pm 0.43$  hrs) show a considerable difference in operative time.<sup>5,8</sup> The variation in operative time may be attributed to difficult dissection, surgical expertise and advanced pathology.

Carlos Augusto Gomes et al showed the mean operative time of  $67.4 \pm 28.1$  min i.e.  $1.1 \pm 0.46$  hrs<sup>12</sup> whereas Katsuno et al., showed a higher mean operative time which was  $116.7 \pm 45$  min i.e.  $1.95 \pm 0.75$  hrs.<sup>17</sup> Another study carried out by Lin et al, 2006<sup>18</sup> on 99 patients showed the mean operative time  $96.1 \pm 43.1$  min i.e.  $1.6 \pm 0.71$  hrs while reports from So et al demonstrated that the mean time was  $73 \pm 25$  min i.e.  $1.21 \pm 0.41$  hrs, in which all patients were operated by trained surgeons.<sup>19</sup>

The mean Operative time of the patients in our study was described to be  $0.99 \pm 0.39$  hours with minimum and maximum operative time of 0.40 and 1.70 hours respectively. Comparing our results with most other studies available, we have displayed a shorter mean operative time which approves the utility of instituting clip closure of the appendix stump with regards to our prevalent set up and local population.

Adding to the favorable profile of this procedure, there is less postoperative pain as well as a shorter recovery time after laparoscopic surgery than after the open procedure.<sup>15,20</sup> It was also associated with minimal hospitalization, rapid convalescent times<sup>21</sup> and a trend towards better physical activity.<sup>20</sup>

## CONCLUSION

The study results lend credence to the fact that Laparoscopic Appendectomy with endoclips is a safe, effective technique and has an admissible short operative time which when combined with

better cosmesis, lesser pain and faster recovery, give it validity and acceptability. Our results generated for the local population will influence our management strategy for acute appendicitis in our set up.

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**Attitude** is a little thing,  
that makes a big **difference**.

”

*“Winston Churchill”*

#### AUTHORSHIP AND CONTRIBUTION DECLARATION

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