

# Compare the Outcomes of Periumbilical Versus Intraumbilical Incision in Patients Undergoing Laparoscopic Appendectomy

MUHAMMAD AKRAM DOGAR<sup>1</sup>, MUHAMMAD AZHAR HASSAN<sup>2</sup>, KHUMAIR ASIF<sup>3</sup>, IBRAHIM SIDDIQUI<sup>4</sup>, TAYYABA RASHEED<sup>5</sup>, LAIBA ZAHID<sup>6</sup>

<sup>1</sup>Professor, <sup>4</sup>House Officer, Department of General Surgery, Central Park Teaching Hospital Lahore

<sup>2</sup>Assistant Professor of Surgery, North Surgical Ward, Mayo Hospital/King Edward Medical University Lahore

<sup>3</sup>Associate Professor of Surgery, Akhtar Saeed Medical & Dental College Lahore

<sup>5</sup>4<sup>th</sup> Year MBBS Student, GMMMC Sukkur

<sup>6</sup>Lecturer, B.Sc. (Hons) Operation Theater Technology, Department of Health Professional Technologist.(DHPT), University of Lahore

Correspondence: Prof. Muhammad Akram Dogar, Email: makramdogar@gmail.com Cell: 0333-5434247

## ABSTRACT

**Aim:** To compare the outcomes of periumbilical incision versus intraumbilical incision in patients undergoing laparoscopic appendectomy.

**Study design:** Randomized controlled trial

**Place and duration:** Department of Surgery, Central Park Medical College and Allied Hospitals Lahore from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2019.

**Methods:** Two hundred patients of both genders with ages 15 to 60 years undergoing laparoscopic appendectomy were included in this study. Patients were equally divided into two groups, each group contains 100 patients, Group I received paraumbilical incision and group II received intraumbilical incision. Outcomes such as hospital stay, postoperative wound infection, nausea, and vomiting and patients satisfaction were examined and compared between both groups.

**Results:** In group I, 55 (55%) were males and 45(45%) were females with mean age 36.45±10.3 years and in group II, 59(59%) patients were males while 41(41%) were females with mean age 35.92±11.02 years. No significant difference was observed regarding hospital stay between both groups p-value >0.05. No significant difference was observed regarding postoperative wound infection between both groups I and II, 4(4%) versus 1(1%) with p-value >0.05. In group II, 1(1%) patient had postoperative nausea and 1(1%) had vomiting while in group I, 2(2%) patients had nausea and 4(4%) had vomiting. In group I, 96% patients were satisfied with the procedure while in group II, 98% patients were satisfied.

**Conclusion:** No significant difference was observed between both procedures regarding hospital stay, wound infection, nausea and vomiting and patients satisfaction. However, intraumbilical incision had fewer complications as compared to periumbilical incision.

**Keywords:** Laparoscopic appendectomy, Periumbilical incision, Intraumbilical incision, Wound infection

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## INTRODUCTION

Laparoscopic surgery is now a widely accepted treatment modality in many fields of general surgery<sup>1-3</sup>. The creation of pneumoperitoneum and the safe placement of the initial trocar are considered very important steps in laparoscopic surgery<sup>4</sup>. A periumbilical incision (a small incision on the superior or inferior border of the umbilicus) is a commonly used method for the initial approach of the laparoscope into the abdomen<sup>5,6</sup>. This periumbilical incision is most often U-shaped at the skin, with a linear fascial incision. It is placed below or above the umbilicus, and it cuts through the skin, the subcutaneous fat, and the fascia. In contrast, the intraumbilical incision is a vertical linear incision from the skin to the fascia, extending only the length of the umbilical ring. Since only the skin and fascia need to be divided, an intraumbilical incision may take less time, is easier to perform, and is theoretically less traumatic.

The intraumbilical incision is being used more frequently, with the increasing cases of single incision laparoscopic surgery (SILS), which has recently been proven to be a feasible alternative for conventional laparoscopic surgery with better cosmetic merit<sup>7,8</sup>. Since

the umbilicus is relatively deeper than the surrounding abdominal wall, it has more bacteria. A recent study found more than 1,400 types of bacteria from 95 umbilical bacteria cultures<sup>9</sup>.

The wound morbidity of perforated appendicitis is known to be higher than that of other simple laparoscopic procedures including nonperforated cases.<sup>10</sup> The present study was conducted aimed to compare the outcomes of periumbilical incision versus intraumbilical incision in patients undergoing laparoscopic appendectomy.

## MATERIALS AND METHODS

This randomized controlled trial was conducted at Department of Surgery, Central Park Medical College and Allied Hospitals Lahore from 1<sup>st</sup> July 2019 to 31<sup>st</sup> December 2019. A total of 200 patients of both genders with ages 15 to 60 years undergoing laparoscopic appendectomy were included. Patients were equally divided into two groups, each group contains 100 patients. Patients detailed demographics including age, sex, body mass index (BMI) and comorbidities were recorded. Patients with abdominal carcinoma, patients with abdominal surgery and those with no consent were excluded. Group I received paraumbilical incision and group II received intraumbilical incision. Outcomes such as hospital stay, postoperative wound

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infection, nausea, and vomiting and patients satisfaction were examined and compare between both groups. All the data was analyzed by SPSS 24. Chi-square test was done to compare the outcomes between both groups with p-value <0.05 was taken as significant.

**RESULTS**

In group I, 55(55%) were males and 45 (45%) were females with mean age 36.45±10.3 years and in group II, 59 (59%) patients were males while 41 (41%) were females with mean age 35.92±11.02 years. No significant difference was found regarding BMI between group I and II (23.42 vs 23.36 kg/m<sup>2</sup>) p-value >0.05. In group I 10(10%) patients had diabetes mellitus, 8(8%) had hypertension and 6(6%) had anemia. In group II, 12(12%) had diabetes mellitus, 10% had hypertension and 4% had anemia, no significant difference was observed (p=>0.05) (Table 1).

No significant difference was observed regarding hospital stay between both groups (2.8±0.6 Vs 2.1±0.3 days) p-value >0.05. No significant difference was observed regarding postoperative wound infection between both groups I and II, 4(4%) versus 1(1%) with p-value >0.05. In group II, 1(1%) patient had postoperative nausea and 1(1%) had vomiting while in group I, 2(2%) patients had nausea and 4(4%) had vomiting. In group I, 96% patients were satisfied with the procedure while in group II, 98% patients were satisfied (Table 2).

**Table 1:** Demographic information of the patients

Variable	Group I	Group II	P value
Age (years)	36.45±10.3	35.92±11.02	0.08
<b>Gender</b>			
Male	55 (55%)	59 (59%)	NS
Female	45 (45%)	41 (41%)	
Mean BMI	23.42	23.36	0.1
<b>Co-morbidity</b>			
DM	10 (10)	12 (12)	NS
Hypertension	8 (8)	10 (10)	
Anemia	6 (6)	4 (4)	

**Table 2:** Comparison of outcomes between both groups

Variable	Group I	Group II	P value
Hospital stay (days)	2.8±0.6	2.1±0.3	0.1
Wound infection	4 (4%)	1 (1%)	0.08
Nausea	2 (2%)	1 (1%)	0.1
Vomiting	4 (4%)	1 (1%)	0.2
<b>Patients satisfaction</b>			
Satisfied	96 (96%)	98 (98%)	0.6
Unsatisfied	4 (4%)	2 (2%)	0.2

**DISCUSSION**

Laparoscopic appendectomy is the commonly performed surgical intervention in all over the world because of its better outcomes such as less hospital stay, less complication, shorter operative time and better cosmetic results<sup>11,12</sup>. Many of techniques have been applied for laparoscopic appendectomy, out of which single incision laparoscopic appendectomy resulted better outcomes with fewer rate of complications as compared to conventional appendectomy.<sup>13,14</sup> In present study we used two different techniques (intraumbilical versus periumbilical incision) in patients undergoing laparoscopic appendectomy and

compare the outcomes between both groups to analyze which one is better. In this regard 200 patients were included. Majority of patients 114(57%) were males while 43% were females and majority of patients were ages above 30 years. These results were similar to many of previous studies in which male patients were high in numbers 55% to 65% as compared to females and most common age group was 35 to 50 years<sup>15,16</sup>.

In present study we found no significant difference regarding body mass index and comorbidities between both groups (p=>0.05). A study conducted by Lee et al<sup>17</sup> reported similarity in which they no significant difference was observed regarding BMI between both groups, they also reported that in intraumbilical group hypertension found in 13.8% and diabetes found in 6.3% patients while in periumbilical group 12.4% patients had hypertension and 10.7% had diabetes.

In present study no significant difference was observed regarding hospital stay between both groups (2.8±0.6 Vs 2.1±0.3 days) p-value >0.05. A study conducted by Rajkhowa et al<sup>18</sup> reported mean hospital stay in intraumbilical group was 5 days and in periumbilical group mean hospital stay was 5 days.

In our study no significant difference was observed regarding postoperative wound infection between both groups I and II 4(4%) Vs 1(1%) with p-value >0.05. A study conducted by Audrey Bouffard-Cloutier et al<sup>19</sup> reported similarity and reported that periumbilical incision had high rate of wound infection as compared to intraumbilical, however no significant difference was observed with p-value >0.05. Another study conducted by Awan et al<sup>20</sup> demonstrated that patients received intraumbilical incision method had fewer rate of port site infection as compared to transumbilical method (5% Vs 5.9%). In group II, 1 (1%) patient had postoperative nausea and 1 (1%) had vomiting while in group I, 2(2%) patients had nausea and 4(4%) had vomiting. These results were comparable to some previous studies<sup>21,22</sup>.

**CONCLUSION**

No significant difference was observed between both procedures regarding hospital stay, wound infection, nausea and vomiting and patients satisfaction about cosmetic results. However, intraumbilical incision had fewer complications as compared to periumbilical incision.

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