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RESEARCH ARTICLE

A Comparison of Cosmetic Outcome of Periumbilical versus Intraumbilical Incision in Laparoscopic Appendectomy and Cholecystectomy-A One Year Randomised Controlled Trial

Dr. M. Sravya Keerthi, Dr. S. S. Shimi Kore, Dr. Manoj D. Togale*

Department of General Surgery, JN Medical College, KLE Academy of Higher Education & Research, Nehru Nagar, Belagavi, Karnataka 590010, India

*zapmanojtogale@yahoo.com

ABSTRACT

Laparoscopic surgeries are advantageous over open surgeries in terms of minimal tissue handling, earlier return of bowel function, less postoperative pain, better cosmesis, lesser duration of hospital stay, earlier return to full activity and decreased overall cost. The incidence of bowel injuries is 0.13%, vascular injuries is 0.05-2% and abdominal wall vascular injuries 0.2-2%. Therefore, safe abdominal entry in laparoscopy is a major concern. Considering the fact that initial entry to abdominal cavity is a blind procedure, there is no ideal entry site. Various entry points used are Umbilicus, Palmar's point, Jain point, Lee-Huang point, etc. The current study aimed to compare the better cosmetic outcome between trans umbilical and periumbilical incision for primary port insertion in cases of Laparoscopic Appendectomy and Laparoscopic Cholecystectomy. This is a one year RCT done in Department of General Surgery, KLEs Dr.Prabhakar Kore Hospital and Medical Research Centre, Belagavi, from January 2022-December 2022. A total of 100 patients operated for laparoscopic appendectomy and laparoscopic cholecystectomy were studied. The patients were divided into Group A and Group B based on type of incision taken either periumbilical or transumbilical. Postoperative cosmetic outcome was analyzed using POSAS score on post op day 3, 7 and 1-month follow up. The results are statistically significant ($P < 0.05$). Between the two incisions during POD# 3 and 7 there is significant difference between variables such as induration, erythema, SSI. In our study 3 cases had SSI in both the groups. Transumbilical incision has better cosmetic satisfaction compared to Periumbilical incision.

Introduction:

In this modern era of Laparoscopic and Robotic surgeries, as we all know it, the present day first laparoscopic surgery was done in the year 1981¹. Since then many laparoscopic surgeries are being performed for various conditions. Laparoscopic appendectomy and laparoscopic cholecystectomy are the most often performed surgical procedure worldwide. In the near future laparoscopic surgeries will be replaced by robotic surgeries². Laparoscopic surgeries or Robotic surgeries are advantageous over open surgeries in terms of minimal tissue handling, earlier return of bowel function, less postoperative pain, better cosmesis, lesser duration of hospital stay, earlier return to full activity and decreased overall cost². In this laparoscopic era, the main challenge is gaining entry into peritoneal cavity, as it is a blind procedure, associated with risks such as vascular injury and bowel perforation. The incidence of bowel injuries is 0.13%, vascular injuries is 0.05-2% and abdominal wall vascular injuries - 0.2-2%³. Therefore, safe abdominal entry in laparoscopy is a major concern. Considering the fact that initial entry to abdominal cavity is a blind procedure, there is no ideal entry site. Various entry points used are Umbilicus, Palmer's point¹⁶, Jain point⁵, Lee-Huang point⁶, etc. The umbilicus is the most preferred considering the following facts⁵: Fixed Peritoneum, Least Vascular, Thin (No muscle or fat between skin and peritoneum and the Cosmetic Major drawback being umbilicus is a dirty area, more prone for infection. It is shown in some studies that,

after sterile preparation for surgery, umbilicus is considered as clean as any other regions in the body. Therefore, risk of infection is same as other regions^{4,9,10}. At the umbilicus, two types of incision can be taken^{7,8,9}.

1. Transumbilical / Intraumbilical
2. Periumbilical (supraumbilical or infraumbilical)

Transumbilical incision is taken by everting umbilicus with graspers, then incising the skin vertically to reach the physiological hernia to enlarge it. The incision is then completed with Hasson's technique. Periumbilical incision taken by everting umbilicus with a grasper and a curvilinear or inverted 'U' shaped incision taken over superior or inferior crease¹² followed by vertical incision over the fascia. The incision is completed with the Hasson's technique. The type of incision to be taken can be decided by the surgeon based on the following factors Based on shape of umbilicus, Better ergonomics, Better cosmetic outcome and Less incidence of surgical site infection. Factors such as shape of umbilicus, ergonomics, incidence of surgical site infection has less significance between the two types of incision. Study conducted by Audrey Bouffard-Cloutier¹⁶, evaluated the preoperative 28% of population did not care about the appearance of umbilicus, but rest of them who gave importance to umbilicus preoperatively showed poor cosmetic scores postoperatively². Till date, very few studies have compared the cosmetic outcome between Transumbilical and Periumbilical incision. Therefore, this study was conducted

to compare the cosmetic outcome between the two types of incisions.

Materials and Methods:

One year randomized controlled trial was conducted in the Department of General Surgery, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum over a period, from January 2019 to December 2019.

Study design: The study design was single blinded randomized controlled trial.

Study period and duration: This study was conducted for the period of one year from January 2019 to December 2019.

Place: Study was done in the Department of General Surgery, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum attached to KLE University's Jawaharlal Nehru Medical College, Belgaum.

Sample size: A total of 100 patients divided into two groups of 50 each were studied.

Sampling procedure

Computer generated random numbers were used to assign the type of surgery to the patients that is, group A (patients undergoing periumbilical incision) and group B (patients undergoing transumbilical incision). Patients were blinded to the intervention. The sample size was taken as 100, with 50 in each group by applying the formula,

$$n = \frac{2(Z\alpha + Z\beta)^2 S^2}{(x_1 - x_2)^2}$$

where, n = sample size

$$Z\alpha = 1.96$$

$$Z\beta = 0.84$$

S = Standard deviation

$x_1 - x_2$ = effect size

Statistical analysis: Student's t- test if assumptions are fulfilled.

Substituting these values in the formula, N=50 and enrolment

PROCEDURE: In both the groups patient presenting to KLE hospital emergency and OPD with complaints of pain abdomen with suspicion of diagnosis of acute appendicitis, perforated appendix, calculus cholecystitis, perforated gallbladder was considered for the study. Under general anesthesia, after catheterization, patient positioned in supine and parts painted with betadine from nipple to mid-thigh and draped in a standard manner.

Intraoperative: Creation of pneumoperitoneum

Closed method: By using veress needle, by inserting veress needle at palmar's point or at umbilicus. 2 mm stab incision taken along the langer's line for insertion of veress needle. Intraperitoneal position of veress needle was confirmed by performing Hanging drop test and saline irrigation test.

Open modified Hasson's technique: In this technique 10mm trocar inserted through a transumbilical or supraumbilical or infraumbilical skin incision of approximately 10-11mm, underlying fascia identified and

opened with knife and grasped with Allie's forceps and 10 mm port is negotiated in to the peritoneum. Simultaneously the safe entry is confirmed by inserting telescope and visualization of peritoneal contents. Pneumoperitoneum created by attaching automated CO2 insufflator. Respective ports are placed according to the surgery performed. In case of laparoscopic appendectomy, two working ports are placed suprapubic and left iliac fossa. In case of laparoscopic cholecystectomy, another 10 mm working epigastric port is placed, and two

working ports are placed in mid clavicle and anterior axillary line. Ports placed and secured. Respective surgical dissection done. Specimen dissected. In case of laparoscopic appendectomy, specimen is retrieved through 10 mm umbilical port. In case of laparoscopic cholecystectomy, specimen is retrieved either from 10 mm epigastric and umbilical port. All cases Skin edges approximated using 3-0 Ethilon vertical mattress sutures.

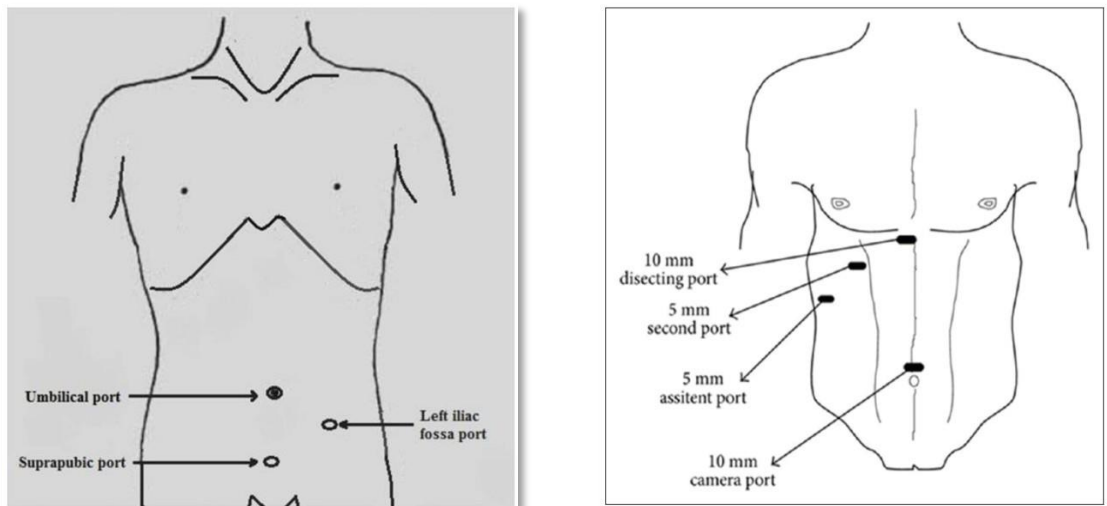


FIG 1: Port placement of A) Lap appendectomy B) Lap Cholecystectomy

ASSESSMENT: First dressing done on post op day #3, wound is inspected for any erythema, induration, collection, discharge, wound dehiscence. Wound Cleaned with spirit and sterile gauze applied.

POSAS score calculated ²⁵. Then every alternate day dressing done on Post Operative day 5,7,9 using spirit and wound is inspected for any signs of infection, wound dehiscence, hypertrophic scar formation.

Outcome variables:

The following POSAS score was calculated for the patients. It has 2 components

1. Observer scar assessment scale
2. Patient scar assessment scale

The various components in observer scar assessment scale include:

- a) Vascularity
- b) Pigmentation
- c) Thickness

- d) Relief Is the scar more stiff
- e) Pliability d) Is the thickness of the scar different
- e) Is the scar irregularc

Various components in patient assessment scale include:

- a) Is the scar painful Each variable has a score between 1- 10, the lower the score, better is the scar. Lower the pain score, lesser pain associated with the incision
- b) Is the scar itching
- c) Is the color of the scar different

		Observer Scar Assessment Scale														
		<i>Normal skin</i>	1	2	3	4	5	6	7	8	9	10	<i>Worst scar imaginable</i>			
Vascularity			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Pigmentation			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Hypo _	Mixed _	Hyper _
Thickness			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Relief			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Pliability			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Total score Observer Scar Scale :																
		Patient Scar Assessment Scale														
		<i>No, no complaints</i>	1	2	3	4	5	6	7	8	9	10	<i>Yes, worst imaginable</i>			
Is the scar painful?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Is the scar itching?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
		<i>No, as normal skin</i>	1	2	3	4	5	6	7	8	9	10	<i>Yes, very different</i>			
Is the color of the scar different?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Is the scar more stiff?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Is the thickness of the scar different?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Is the scar irregular?			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Total score Patient Scar Scale :																

FIG 2: POSAS SCAR ASSESSMENT SCALE

STATISTICAL ANALYSIS: The data obtained was coded and entered in Microsoft Excel Spread sheet. The categorical data was expressed as rates, ratios and percentages and comparison was done using chi-square tests, Mann-Whitney U tests and Wilcoxon matched pairs test. Continuous data was expressed as mean \pm standard deviation. A 'p' value of less than or equal to 0.05 was considered as statistically significant.

RESULTS: In the present study, distribution of age groups in group A (periumbilical) and group B(transumbilical) are 10% v/s 16% <20 yrs, 32% v/s 35% between 21-30 yrs, 28% v/s 21% between 31-40 yrs, 18% v/s 15% between 41-50 yrs, 12% v/s 13% between 50yrs and above are comparable. The mean age in group A is 34.60 ± 12.22 years compared to 33.16 ± 14.73 years in group B, the youngest patient being 18 yrs of age. However the difference was statistically not significant ($p=0.2385$). 34% were males and 66% were females in group A and 47% were males and 53% were females. In the present study, based on diagnosis, 48% were cases of acute appendicitis in group A and 76% in group B. 50 % were cases of calculus cholecystitis in group A and 12% in group B. 2% were cases of chronic appendicitis in group A and 8% in group B. in group B 2% cases are diagnosed with perforated appendix and another 2% cases are diagnosed with perforated gallbladder. In group A 52% cases underwent Laparoscopic appendectomy v/s 86 % cases in group B and 48% cases underwent Laparoscopic

cholecystectomy v/s 14% in group B. 50% cases of Group A undergone supraumbilical incision and rest 50% have undergone infraumbilical incision, whereas 100% cases of group B undergone transumbilical incision. The incidence of SSI is equal in both the groups i.e. 3%, which is considered statistically insignificant ($p=1.0$). In the present study, the mean duration in minutes from time of incision to wound closure was compared, which shows it takes a mean time of 100.90 minutes in group A compared to 87.90 minutes in group B, which shows a 5% level of significance ($p<0.05$). From the results from the above table, POSAS score obtained at different times, POD#3 mean is 71.44 ± 7.51 in group A v/s 54.84 ± 12.81 in group B, whereas mean score on POD#7 is 67.32 ± 8.11 v/s 51.36 ± 13.01 between group A and group B and 61.98 ± 7.63 v/s 47.54 ± 13.34 on 1 month follow up between group A and group B. The results are statistically significant ($P<0.05$). The mean POSAS scores on day 3, day 7 and 1 month post operative (71.44 ± 7.51 , 67.32 ± 8.11 and 61.98 ± 7.63) in Group A (periumbilical incision) was significantly higher than those seen on postoperative day 3, day 7 and 1 month (54.84 ± 12.81 , 51.36 ± 13.01 and 47.54 ± 13.34 respectively) in Group B (transumbilical incision). The percentage of change in the POSAS score from day 3 to day 7 was slightly higher in Group B (6.35%) than Group A (5.77%). The percentage change from day 3 to 1 month postoperative was almost similar in both Group A and B (13.24% and 13.31%). However, patients in Group B with an

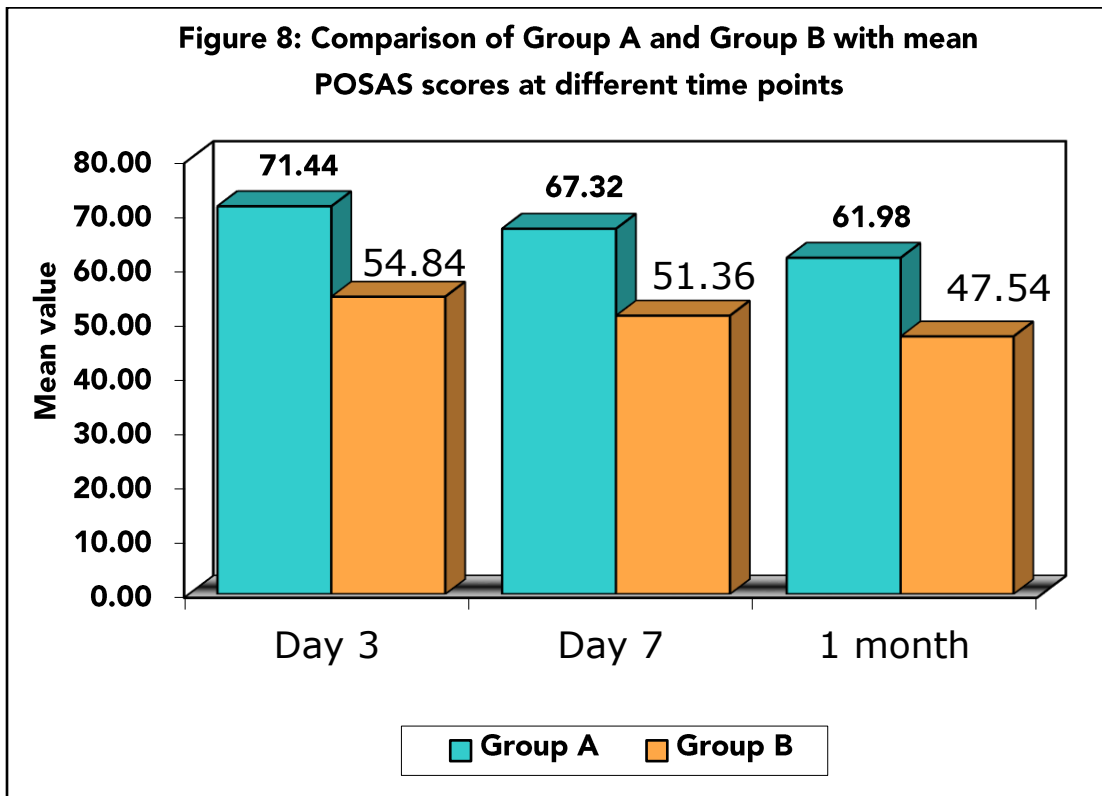
intraumbilical incision started with a significantly lower POSAS score on day 3. From the results from the above table, it is

noted that at different points of time, the difference between POSAS score between the two incisions is statistically significant.

Comparison of Group A and Group B with mean POSAS scores at different time points by t test

Time points	Group A		Group B		t-value	P-value
	Mean	Std.Dev.	Mean	Std.Dev.		
Day 3	71.44	7.51	54.84	12.81	7.9031	0.0001*
Day 7	67.32	8.11	51.36	13.01	7.3620	0.0001*
1 month	61.98	7.63	47.54	13.34	6.6456	0.0001*
Day 3 to Day 7	4.12	3.19	3.48	4.72	0.7950	0.4285
Day 3 to 1 month	9.46	5.21	7.30	6.14	1.8969	0.0608
Day 7 to 1 month	5.34	4.12	3.82	4.07	1.8564	0.0664

*p<0.05



From the results from the above table, POSAS score obtained at different times, POD#3 mean is 71.44 ± 7.51 in group A v/s 54.84 ± 12.81 in group B, whereas mean score on POD#7 is 67.32 ± 8.11 v/s $51.36 \pm$

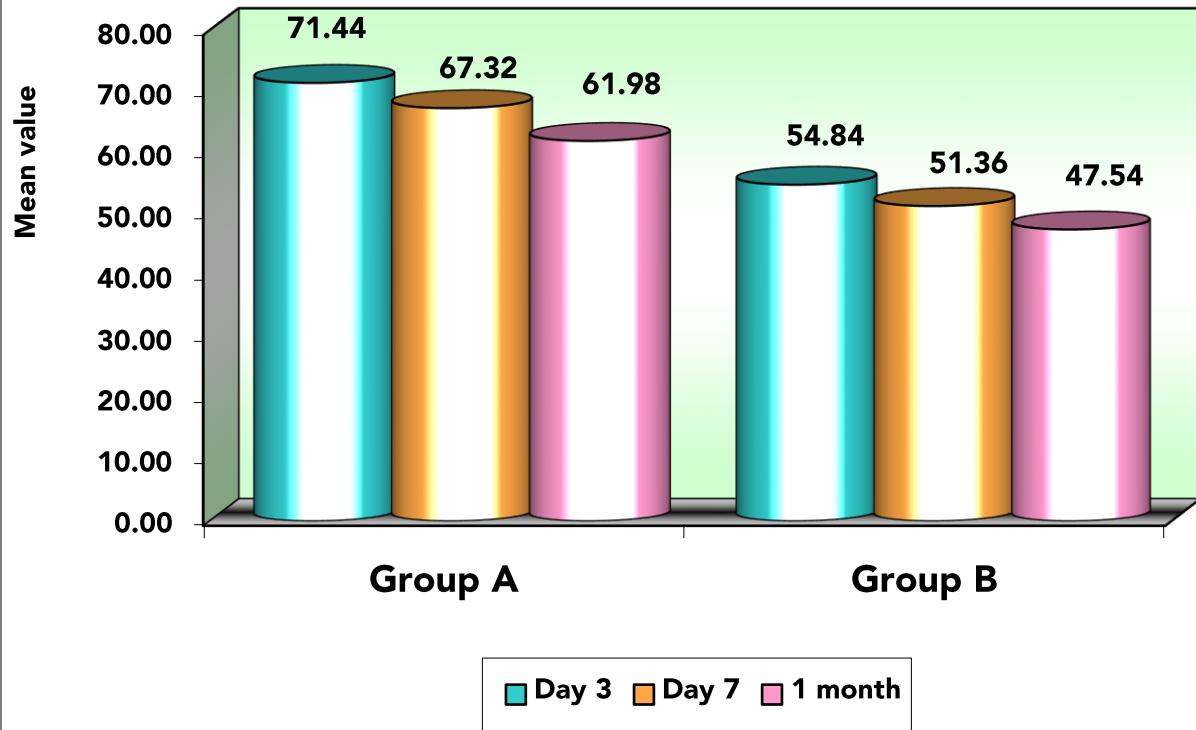
13.01 between group A and group B and 61.98 ± 7.63 v/s 47.54 ± 13.34 on 1 month follow up between group A and group B. The results are statistically significant ($P < 0.05$).

Comparison of dya3, day 7 and 1 month time points with mean POSAS scores in group A and group B by Dependent t test

Groups	Time points	Mean	Std. Dv.	Mean Diff.	SD Diff.	% of change	t-value	p-value
Group A	Day 3	71.44	7.51					
	Day 7	67.32	8.11	4.12	3.19	5.77	9.1449	0.0001*
	Day 3	71.44	7.51					
	1 month	61.98	7.63	9.46	5.21	13.24	12.8471	0.0001*
	Day 7	67.32	8.11					
	1 month	61.98	7.63	5.34	4.12	7.93	9.1678	0.0001*
Group B	Day 3	54.84	12.81					
	Day 7	51.36	13.01	3.48	4.72	6.35	5.2162	0.0001*
	Day 3	54.84	12.81					
	1 month	47.54	13.34	7.30	6.14	13.31	8.4042	0.0001*
	Day 7	51.36	13.01					
	1 month	47.54	13.34	3.82	4.07	7.44	6.6380	0.0001*

*p<0.05

Figure 9: Comparison of day 3, day 7 and 1 month time points with mean POSAS scores in group A and group B



The mean POSAS scores on day 3, day 7 and 1 month post operative (71.44 ± 7.51 , 67.32 ± 8.11 and 61.98 ± 7.63) in Group A (periumbilical incision) was significantly higher than those seen on postoperative day 3, day 7 and 1 month (54.84 ± 12.81 , 51.36 ± 13.01 and 47.54 ± 13.34 respectively) in Group B (transumbilical incision). The percentage of change in the POSAS score from day 3 to day 7 was slightly higher in Group B (6.35%) than Group A (5.77%). The percentage change from day 3 to 1 month postoperative was almost similar in both Group A and B (13.24% and 13.31%). However, patients in Group B with an

intraumbilical incision started with a significantly lower POSAS score on day 3.

From the results from the above table, it is noted that at different points of time, the difference between POSAS score between the two incisions is statistically significant.

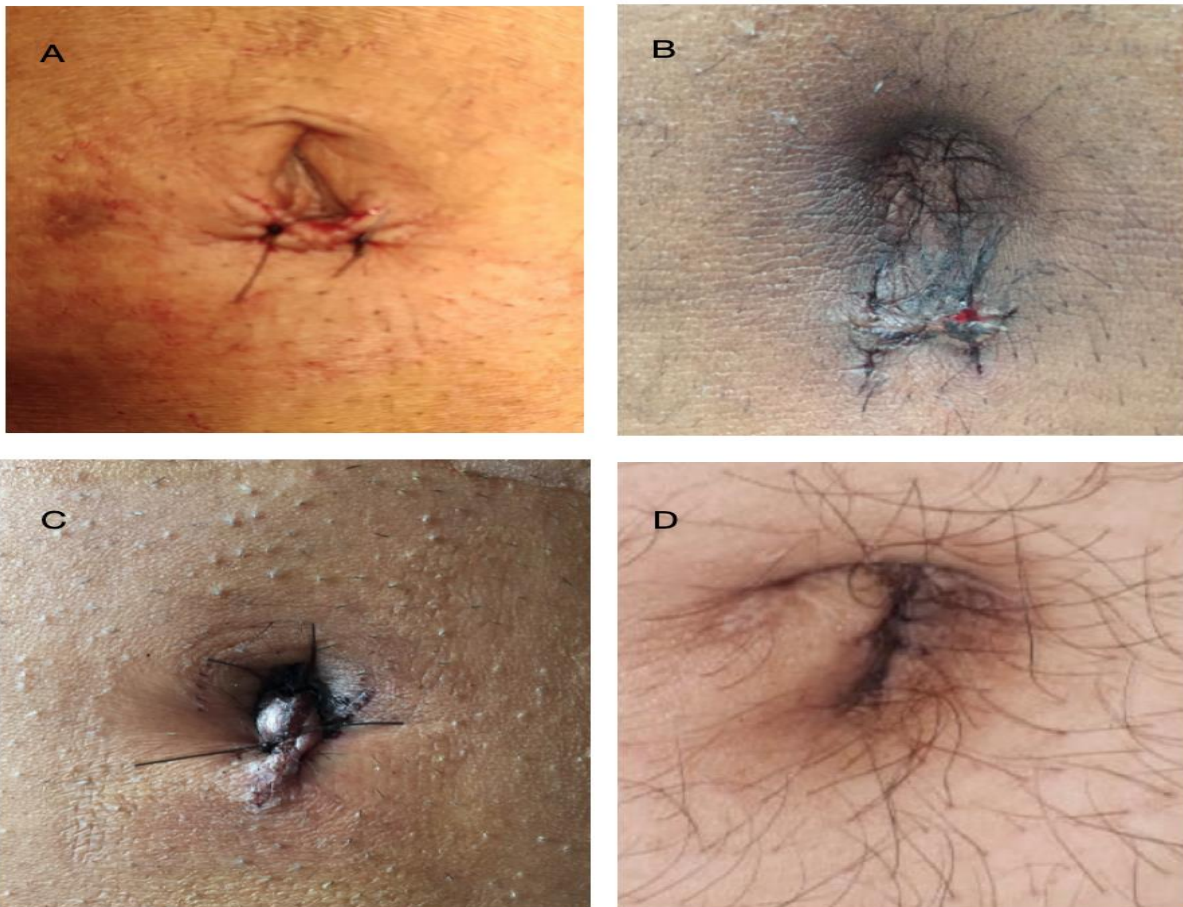


Image A: infraumbilical incision on POD 3; Image B: appearance of infraumbilical incision wound after suture removal image C: trans umbilical incision on POD 3; Image D: Appearance of infraumbilical incision wound after suture removal.

DISCUSSION: In daily practise, laparoscopic procedures are supplanting open procedures; intraperitoneal access is obtained through numerous entry points, including the umbilicus. Useful are Palmar's point⁴⁸, Lee-Huang's point⁶, and Jain's point⁵. Umbilicus is the preferable entry point for the first trocar. In general, two varieties of incisions are made: periumbilical and transumbilical. Although previous research indicates that transumbilical incision results in greater patient cosmetic satisfaction than periumbilical incision, most

surgeons prefer periumbilical incision for fear of complications such as wound infection or umbilical hernia. Comparative studies comparing the postoperative complications of transumbilical and periumbilical incisions have revealed similar outcomes for both groups. On the other hand, patients who undergo a transumbilical incision frequently exhibit cosmetic improvement. The purpose of our study was to compare the cosmetic appearance of the two incisions and the incidence of postoperative complications

such as pain, surgical site infection, and umbilical hernia.

Comparatively, the average ages of groups A and B were 34.60 12.22 years and 33.16 14.73 years, respectively. This nullified the age factor bias that can occur during wound recovery and is therefore a crucial cosmesis parameter.

The periumbilical incision was performed more frequently on females. Sixty-six percent of Group A patients were female. Since umbilical hernia is more prevalent in females⁴², with a female to male ratio of 3:1, this may be a significant factor in the surgeons' decision to use a periumbilical incision (which is believed to result in fewer complications) in females.

Surgeries involving the gallbladder typically utilised a supraumbilical incision. This was due to the shorter working distance achieved with this type of incision.

As seen in most other studies comparing periumbilical and infraumbilical incisions, the infection rate at the surgical site was comparable in our study. In both Group A and Group B, 3 (6% of patients) contracted a surgical site infection. This finding contradicts the widespread belief among surgeons that infraumbilical incisions carry an increased risk of SSI.

The mean duration of surgery was substantially longer for patients undergoing a periumbilical incision (104.90 minutes) than for those undergoing a transumbilical incision (87.70 minutes). This may be an incidental discovery from our research. Previous

research has demonstrated that infraumbilical incisions require less time to perform. However, in our circumstance, the expertise of the surgeon can be a confounding variable.

The POSAS (Patient and Observer Scar Assessment Scale) evaluated the scar on postoperative days 3, 7, and 30. Six parameters of scars were included in the observer component: vascularity, pigmentation, thickness, relief, pliability, and surface area. The patient component included six parameters: discomfort associated with the scar, itchiness, colour, stiffness, thickness, and irregularity.

The mean POSAS scores on postoperative day 3, day 7 and 1 month were significantly higher in Group A (periumbilical incision) compared to Group B (transumbilical incision) (71.44 7.51, 67.32 8.11, and 61.98 7.63, respectively). These results were consistent with most comparative studies examining incision characteristics.

The percentage change in POSAS score from day 3 to day 7 was marginally greater in Group B (5.65%) than in Group A (5.77%). The percentage change from day 3 to one month postoperatively was nearly identical in Group A and Group B (13.24 and 13.31 respectively). On day 3, however, Group B patients with infraumbilical incisions had a substantially lower POSAS score. This indicates that both types of incisions heal at the same rate, and that no incision heals quicker than the other when all other parameters are held constant. In their study, Audrey Bouffard- Cloutier, Alex Pare, and Nathalie McFadden¹⁴, Canada, measured the patient's cosmetic satisfaction,

incidence of surgical site infection, and operative time as primary outcomes, as well as the patient's valuation of the aesthetic aspect of the umbilicus. CSS was evaluated using an inverted 10-point facial grimace-type scale, obtained 30 days post-op and 180 days post-op, and the incidence of Surgical Site Infection was assessed by reviewing the 4–6-week post-op evolution notes of the attending surgeons; operative time was extracted from the patient's electronic medical record. They included a total of 63 patients, 56 of whom produced analyzable data, and compared 27 patients in the PUI group to 27 patients in the TUI group. In this study, the cosmetic satisfaction scores, incidence of surgical site infections, and operative times are comparable between the two groups. The 28% of patients who prioritised the aesthetics of their umbilicus prior to surgery have experienced a significant decline in their cosmetic satisfaction score (CSS). It was observed that a preoperatively higher CSS led to a substantial postoperative CSS decline." In the preceding research, they used CSS, which is a subjective score, whereas in our study, we employed the POSAS scale, which combines objective and subjective evaluation and yields more significant results. South Korea's Jun Suh Lee et al.,⁸ conducted a retrospective study on 280 patients, comparing 159 patients treated with infraumbilical incision to 121 patients treated with periumbilical incision. Primarily, wound complication rates were compared alongside operation duration and postoperative hospital stay, with the conclusion that "there is no significant difference between postoperative

complications between the two incisions." Similarly, in our study, pain scores on the POSAS scale were comparable between groups, and the incidence of SSI was comparable between groups.

Mehmet Baki Senturk et al. enlisted 105 patients undergoing laparoscopic surgery for their prospective Canadian Task Force classification II-130 study. They conducted the research to determine which of the umbilical entry routes for intraperitoneal access yields a more aesthetically pleasing outcome. Patients' demographics, BMI, entry site of the trocars (infra-trans-supraumbilical), type of incision (vertical or transverse), duration of the operation, and scar properties at follow-ups were prospectively collected and analysed. At week 12 postoperatively, another surgeon assessed the scar using the Vancouver scar scale to evaluate the healing of the port entry site in the umbilical region, including evaluations of vascularity, pigmentation, pliability, height, and cosmetic appearance. A total of 105 patients were included in the study, with a mean age of 39.79 ± 11.99 years, whereas the mean age of our 100 patients is 34 ± 12.22 years. They found no statistically significant difference in cosmetic outcomes between patients who underwent transumbilical, infraumbilical, and supraumbilical incisions.

Nozaki et al.⁴³ demonstrated that a U-shaped infraumbilical incision that is traditionally made along the umbilical ring and the standardised site for accessing the abdominal cavity for laparoscopy are well known; however, this type of incision results in a larger postoperative scar or umbilical deformity.

Therefore, the umbilical depression was excised, and a midline longitudinal skin incision was made on the umbilicus. The extent of the incision was within the depression of the umbilical cord. Scar retreated into umbilicus and was barely discernible. Considering that the transumbilical incision scar can be concealed within the umbilicus, the transumbilical incision is preferable to the periumbilical incision.

Kim et al.⁴² favoured a supraumbilical incision for access to the peritoneal cavity because, based on the complaints of female patients regarding their postoperative scarring, they believed it produced superior cosmetic outcomes. The scar from the supraumbilical incision was scarcely noticeable. Three months after surgery, both patients and surgeons were pleased with the cosmetic results of the supraumbilical entry, and the scar had blended into the natural umbilical crease. In our study, 60% of female patients underwent periumbilical incision, consistent with the article; however, the cosmetic score is higher in the periumbilical group compared to the transumbilical group. This may be because female patients place a greater emphasis on the aesthetic appearance of the umbilicus. The position, shape, size, and profundity of the umbilicus affect the overall aesthetics of the abdomen, and the incisions made around the umbilicus have a significant impact on the overall aesthetic outcome and patient satisfaction postoperatively. Depending on the morphology of the umbilicus and the incidence of postoperative complications, the surgeon can select the

type of incision that will result in a scar that is less noticeable postoperatively. Various postoperative complications, such as surgical site infection, incision dehiscence, and umbilical hernia, may have an impact on the final cosmetic result. Early studies have demonstrated that there is no significant difference between the incidences of postoperative complications in either group; therefore, the purpose of this study was to compare which group had superior cosmetic outcomes.

Additionally, it is important to remember that the type of suture material, skin staples, and type of sutures placed, such as vertical mattress, inverted mattress, subcuticular, and glue, can impact the cosmetic outcome and proper wound healing. According to our research, all cases of skin approximation were performed using vertical mattress sutures with Ethilon 3-0. Earlier studies demonstrated that there was no difference in cosmetic outcome between the use of different suture materials for the periumbilical incision.

Sinha utilised all three techniques and discovered that the transumbilical incision, as opposed to the supra and infraumbilical incisions, results in a scar with a better cosmetic appearance and a virtually normal looking umbilicus⁴⁶. Transumbilical camera port insertion does not leave a lesion but has a higher rate of complications. Numerous paediatric surgeons use supraumbilical or infraumbilical port incisions due to complications associated with transumbilical port insertion, such as wound site infection and trocar site hernia⁴⁷. According to our

investigation, the cosmetic outcome of transumbilical incision is superior to other techniques with postoperative complications.

In a study conducted by Akhila Vasudeva, Vidyashree G Poojari, Shanthala Rudrappa, and Jyothi Shetty²¹, it was determined that, even though subcuticular suture theoretically promotes faster wound healing, objective wound variables such as induration, erythema, discharge, and incidence of surgical site infections were equally distributed between the two groups. In order to eliminate confounding variables such as type of suture material, length of incision, surgeon expertise, and type of skin sutures, all patients in group A are operated on by a single surgeon, while all patients in group B are operated on by a different surgeon. In all instances, the same suture material, 3-0 Ethilon, is utilized, as well as intermittent mattress sutures.

Several factors that influence the overall cosmetic outcome of the two incisions, including the size of the blade, the length of the incision, the type of suture material, and the type of sutures, are considered for all cases in both categories. Prior studies suggested that periumbilical incision results in inferior aesthetic outcomes; our study correlates with the hypothesis but yields comparable results. In our study, the incidence of post-operative complications such as surgical site infection, wound dehiscence, umbilical hernia, and hypertrophic scar formation did not differ significantly.

Our research demonstrates that infraumbilical incision is more aesthetically pleasing than

periumbilical incision. Since the rates of complications and surgical site infections are comparable between infraumbilical and periumbilical incisions, infraumbilical should be preferred over periumbilical for increased patient satisfaction.

CONCLUSION:

Transumbilical incision provides greater cosmetic gratification than periumbilical incision. Although most patients place little importance on the appearance of the umbilicus, those patients who did so preoperatively had lower cosmetic satisfaction scores after surgery. Since the appearance of the umbilicus is a significant concern for a subset of patients undergoing laparoscopic surgery, the surgeon should discuss the various types of incisions and their outcomes with the patient prior to the procedure in order to increase patient satisfaction.

Corresponding author:

Dr. Manoj Togale

Department of General Surgery,

J N Medical College, KLE Academy of Higher
Education and Research, Belagavi, Karnataka.

Email: zapmanojtogale@yahoo.com

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Conflict of Interests

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