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RESEARCH ARTICLE
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COMPARATIVE STUDY BETWEEN CONVENTIONAL VERSES UNDER VISION CLOSURE FOR LAPAROSCOPIC PORT SITE-PROSPECTIVE STUDY

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Abstract
Objective. To study the comparison Between Conventional Versus Under Vision Closure For Laparoscopic Port Site-Prospective cross sectional interventional study
Methods: All patients admitted in Department of Surgery Shri B.M.Patil Medical College, Hospital and Research centre, Vijayapur between September 2016 to August 2018. The patient will be divided under 2 groups-the first group will undergo closure conventionally and second under vision**.**
Result: Total of 198 cases were considered out of which, the complications were tabulated and was seen that port site bleeding was seen in 5.1% in case and 7.1% in control, the p value was calculated to be 0.267. Port site infection was seen in 9.2% in case and 14.3% in control, the p value was calculated as 0.316. Port site hernia was seen in only 1 case in the control group, p value was found to be 0.551.
Conclusion: Port site complications are very minimally associated with laparoscopic surgeries. In our study we found only 1 case with herniation of small bowel. All the complications were managed with minimal intervention, and morbidity. Consideration of meticulous surgical technique during closure of the port can minimize these complications. There were 0.14% laparoscopic port site hernias, which is less. But designing a method for port closure, will reduce the incidence still further

Keywords: Conventional Verses Under Vision Closure, Laparoscopic Port Site,

Introduction

Laproscopy was introduced in the year 1987, by Mouret, now it is widely been accepted and applied in all branches of surgery. Incisional hernia can occur after any abdominal surgery and laparoscopic surgery is not immune to this complication. The hernia that follows laparoscopy usually occurs through the larger ports (size greater than 10mm ports), especially from the umbilical port.(1)
Port site hernia is a important and unrecognized complication in laproscopy which carries a high risk of strangulation due to the small size of defect involved. Hence the port closure is a important step after the surgery. Hence many methods have been tried to adequately close the port site.
Among all these factors, the single most important factor remains the improper closure of the fascial defects at the port sites. Computed tomography scans are helpful in its diagnosis and treatment. The

incidence of incisional hernia occurring at the port sites lies between 0.02-3.6% and usually remains unreported, until the development of complications.[2]

Predisposing factors include:

1. Previous laparoscopies
2. Extensive manipulation during surgery
3. Increased intra –abdominal pressure
4. Obesity
5. Use of sharp cutting-tip trocars
6. Rapid abdominal deflation at the end of surgery
7. Poor port removal technique
8. Wound extension
9. Male sex and infection of the wound.[3]

To avoid the complications associated with port site closure, over the period of time many techniques have been developed to ascertain that the fascial layer of the larger ports such as 10mm and 12mm are closed completely.

In 1968, Fear was the first to report ventral hernia at a trocar site after laproscopy. Trocar complication occur in approximately 1 to 6% of patients. He also mentioned that by incorporating the peritoneum into the fascial layer the incidence of trocar site hernia's reduce.[4]

This study was undertaken to compare between conventional verses undervision closure for laparoscopic port site.

METHODOLOGY

Source of data

- All patient's admitted in Department of General Surgery between September 2016 to August 2018 were included.

Sample size

TOTAL SAMPLE SIZE: 196(Each group consists of 98 patients)

With 95% level of confidence and margin of error ±1%.Considering 80% of admitted patients.

METHOD OF COLLECTION OF DATA:

- The patient will be divided under 2 groups-the first group will undergo closure conventionally and second under vision.
- Operative time will be noted in the groups, port site bleeding, infection and follow up for 3 months for port site associated hernia

Mode of selection of cases and method of analysis

Study design: - Prospective study

Study type: - Interventional

INCLUSION CRITERIA

Patients undergoing all abdominal laparoscopic surgery.

INVESTIGATION

Investigations or interventions required in this study are routine standardized procedures.

There are no animal experiments involved in this study.

These routine investigations are required and necessary for routine postoperative follow-up (after 3 months):

1. Ultrasonography of abdomen.

METHOD:

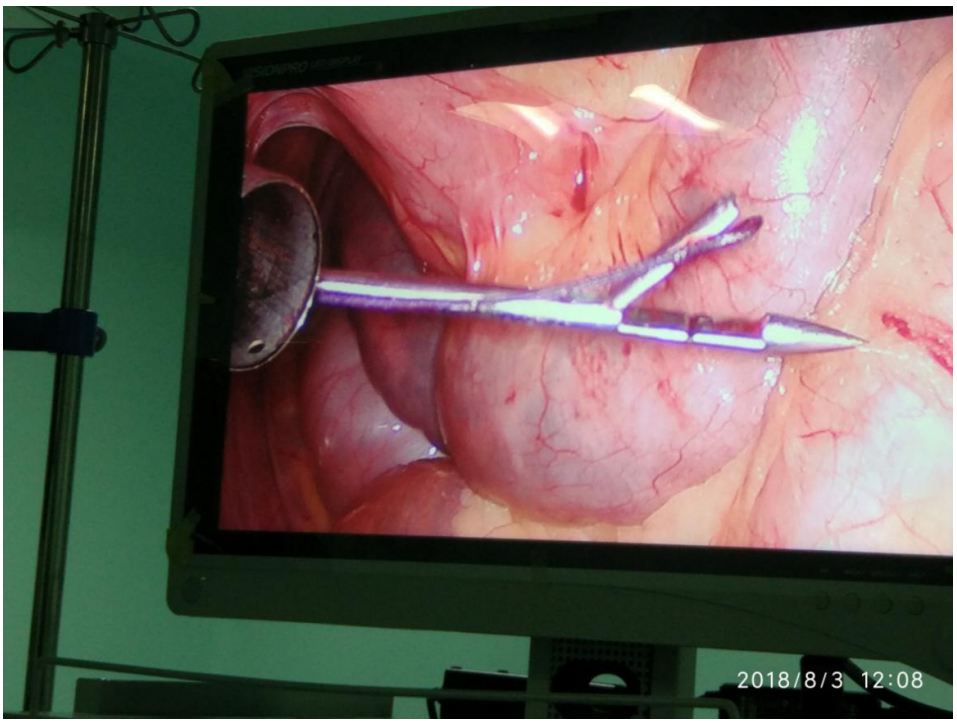
Detailed history of the patient is taken, after explaining the procedure to the patient in detail, the consent is taken from the patient and if the patient is minor consent is taken from the parent/guardian.

Preoperatively chest ultrasonography of the abdomen is done to confirm the pathology and the surgery is planned.

Method for cases to be closed under vision:-

At the end of surgery and removal of specimen, confirming that the operated site is clean. The 10mm umbilical port is visualized using a 4mm scope which is passed from the 5mm port. It is ensured that no adhesions and vessels are present at the 10mm port site, it is visualized clearly. Using cobbler needle and vicryl no.1 one side of the port is pierced and the end is left inside, care should be taken not to injure the bowel. From the other end the cobbler needle is again pierced from the other side, care should be taken not to injure bowel. And also ensure that all the layers are included. Once it is ensured that no bowel is included and all the layers are included, the trocar is removed and the two end's of the vicryl are tied outside.the time is started from the piercing of cobbler needle till vicryl is tied outside. Intraopertively we look for any port site bleeding and intraopertive complication like bowel injury, injury to vessels are tackled and noted, the time for port site closure is also noted in by this method we confirm that all the layers are included and post operative hernia chances are also reduced.

Post operatively the patient is followed up till 1 month to look for port site infection, followed by at 3 months for port site hernia.



Method for port site closure in control:-

At the end of surgery and removal of specimen, confirming that the operated site is clean. Haemostasis is achieved, the 10mm port is removed, and using allis forceps, both the side of rectus sheath are held and a deep bite is taken using vicryl no 1, to close the port site. The time needed to close the port is noted, and if their is any port site bleeding and any intraoperative complications. As this is a blind procedure, we are not sure if we have taken any bowel underneath and also if the port site is completely closed.

Post operatively the patient is followed up till 1 month to look for port site infection, followed by at 3 months for port site hernia.

STATISTICAL METHOD APPLIED

All characteristics were summarized descriptively. For continuous variables, the summary statistics of mean, standard deviation (SD) were used. For categorical data, the number and percentage were used in the data summaries. Chi-square (χ^2)/Freeman-HaltonFisher exact test was employed to determine the significance of differences between groups for categorical data. The difference of the means of analysis variables between two independent groups was tested by unpaired t test. If the p-value was < 0.05, then the results were considered to be statistically significant. Data were analyzed using SPSS software v.23.0.and Microsoft office.

RESULTS

In this study we had compared

Three criteria among which,

1) The mean duration of port closure in cases is 2min and standard deviation is 0.9, whereas in control the mean is 1.5 and standard deviation is 0.6. The p value was found to be <0.001 which is significant. Which shows that the time required to close port under vision is more.

PARAMETER	CASES		CONTROL		p value
	Mean	SD	Mean	SD	
DURATION OF PORT CLOSURE	2.0	0.9	1.5	0.6	<0.001*

2) The complications were tabulated and was seen that port site bleeding was seen in 5.1% in case and 7.1% in control, the p value was calculated to be 0.267. Which shows the port's closed by conventional method had more chances of port site bleeding.

COMPLICATIONS	CASES		CONTROL		p value
	N	%	N	%	
PORT SITE BLEEDING	5	5.1	7	7.1	0.267
INTRA OPERATIVE COMPLICATIONS	0	0.0	0	0.0	0.316
PORT SITE INFECTION	9	9.2	14	14.3	-
PORT SITE HERNIA	0	0.0	1	1.0	0.551
Total	98	100.0	98	100.0	

3) Port site infection was seen in 9.2% in case and 14.3% in control, the p value was calculated as 0.316 incidence rate is more in control group.

4) Port site hernia was seen in only 1 case in the control group, p value was found to be 0.551.

DISCUSSION

Port site complications can be divided into

1) Access-related complications
2) Postoperative complications,

They have been reported in all age groups and in both genders. The literature shows that obesity is associated with increased morbidity related to port site due to various factors like the need for longer trocars, thick abdominal wall, need for larger skin incision to expose fascia adequately, and limitation in mobility of the instrument due to increased subcutaneous tissue.[(1)]

The rapid advancement in science in CCD cameras and the flexible light sources have made the laparoscopic surgery more affordable and widely available. As a result, the use of laparoscopy has expanded to more sophisticated surgeries as well as management of malignancies. [(5)]

In our study we included total of 196 cases, which included 98 in each group, that is control and case study.

Comparison of total number of cases and sex:-

We compared the Total number of cases taken were 98, out of which 57 were male and 41 were female. The p value was found to be 0.387. And in control group 35 were male and 63 were female. The p value is calculated to be 0.553.

In a study conducted by Somukarthik et al total number of cases were 570 which included 307 male and 263 female.[1]

Comparison of distribution of age:-

According to age distribution maximum number of cases were seen in 21-30 yrs in case group and in control they were seen in between 31-40 yrs. The p value was calculated as 0.29. Mean of the age was calculated in both the groups, mean of the cases is 33.1 and standard deviation is 16.4 and mean of control group is 34.5 with standard deviation of 17.5 the p value was calculated to be 0.57.

Ina study conducted by Somukarthik et al the age of the patients were between 13 to 80 years.[1]

Comparison of sex according to cases and controls:-

According to sex distribution total number of male's in case group were 57 followed by females 41, whereas in control group males were 35 and females were 63. The p value was calculated to be 0.002 which is significant.

In study conducted by Somukarthik et al 307 were male patient s and 263 were female patient's.[1]

In a study conducted by G.G.Ravindranath et al which had 328 patients, 229 (69.8%) were females and 99 (30.2%) were males.[5]

Comparison mean duration of port closure according to cases and controls

The mean duration of port closure in cases is 2min and standard deviation is 0.9, whereas in control the mean is 1.5 and standard deviation is 0.6. The p value was found to be <0.001 which is significant.

In a study conducted by AbijitShetty et al, compared the time taken for port closure using hand closure technique and carter thomsan needle which showed mean of 15min in hand closure and 8min in carter thomsan, by which he concluded that the time taken is less for carter thomsan, but in our study the time taken is more in under vision facial closure.[6]

Comparison of diagnosis according to cases and controls

The total number of cases were 98 out of which maximum number of cases were acute appendicitis (39) followed by Cholelithiasis (15). In control group 98 cases were considered out of which maximum number of cases were Cholelithiasis (22) followed by acute appendicitis (21). So in total 60 cases were acute appendicitis and Cholelithiasis were 37 cases. The p value showed 0.013 which is significant.

In a study conducted by SomuKarthik et al it was found that total number of cholelithisis were 207 whereas appendicitis were 169.[1]

Comparison of type of surgery according to cases and controls

According to the total number of surgeries maximum were laparoscopic appendectomy (67) followed by laparoscopic cholecystectomy (21). In control maximum number of cases were laparoscopic cholecystectomy (53) followed by laparoscopic appendectomy (31). The p value was found to be 0.042 and was found to be significant.

In a study conducted by SomuKarthik et al it was found that total number of Cholelithiasis were 207 whereas appendicitis were 169.[1]

Comparison of port site bleeding

Port site bleeding was seen in 5.1% in case and 7.1% in control, the p value was calculated to be 0.267. In laparoscopic surgeries if there are any subcutaneous vessels which are not visualized properly, there are chances of injury, hence while removing trocar there can be intraoperative bleeding , in this technique these vessels are closed with the port and hence it can be assured that there is no port site bleeding.

In a study done by SomuKarthik et al which showed to have "Incidence of port site bleeding is 0.7%. Injury to epigastric vessels can be related to carelessness during the operative procedure usually during the placement of secondary trocars which should be placed under direct vision and with prior illumination of the abdominal wall. Bleeding from the abdominal wall may not become apparent until after the port is removed because the port may tamponade muscular or subcutaneous bleeding. In addition to visually inspecting the access site upon its creation, the site should also be inspected during and following removal of the port.

Bleeding points can usually be identified and managed with electrocautery. On occasions, the skin incision may need to be enlarged to control the bleeding. If persistent bleeding continues, a Foley catheter can also be inserted, inflated, and gentle traction applied to tamponade the site. Also, U-stitches can be placed into the abdominal wall under direct laparoscopic visualization using a suture passer with absorbable braided sutures. A number of specialized instruments have been devised for fascial closure at the port site and these may also be useful for managing abdominal wall bleeding".[(1)]

Comparison of port site infection

Port site infection was seen in 9.2% in case and 14.3% in control, the p value was calculated as 0.316.

In a study conducted by SomuKarthik et al which showed 10 cases to have port site infection out of 570 cases, and among 10 cases port site infection was found in laparoscopic cholecystectomy, and total extra peritoneal repair.[(1)]

In a study conducted by AbhijitShetty et al showed port site infection in 2 cases in hand closure technique and 1 case in carter thomsan needle.[(6)]

Similar was the case in a study by Adisa et al, where 75% of the cases had superficial infections. Similar cases were reported form other studies.[(7)]

Comparison of intra operative complication:-

In our study there were no intraoperative complication s in both case and control.

In a study conducted by SomuKarthik et al which showed, omentum related complications, which accounted for 0.4%. These complications are attributed to

1) Prior to removing the port the gas must be deflated completely
2) Inadequate closure
3) Larger incision than port.

This can be avoided by

1) All the ports should removed under vision
2) After release of gas the primary port should be removed with the camera
3) Appropriate size of incision
4) To adequately close the port.

Two patients had omentum-related complications at the port site (11.8%, n = 2). Those were immediate postoperative herniation/ entrapment of the omentum from the site of umbilical (camera) port and late (3 months post-surgery) herniation of the omentum from the umbilical port site scar (port site hernia). Both were associated with 10 mm ports and the fascia was closed by the conventional method.

Other documented omental complication include laceration, penetrating injury, omental bleeding and post operatively granulomas of the omentum.[(1)]

Comparison of port site hernia's.
Port site hernia was seen in only 1 case in the control group, p value was found to be 0.551.
In a study conducted by AbdulzahraHussain et al which showed [3]

Sl no	Type of case	Number of cases of port site hernia	Total number of cases
1	Nissen's fundoplication	1	456
2	Laparoscopic cholecystectomy	2	1621
3	Groin hernia repair	5	1833

In other study conducted by somukarthik et al which showed 1 port site hernia in laparoscopic appendicectomy out of 570 patients. The hernia was seen at umbilical port.[1]
In other study conducted by AbhijitShetty et al, which showed port site hernia in only 1 case p value was found to be 0.003.[6]

CONCLUSION

Port site complications are very minimally associated with laparoscopic surgeries. Complication at port site include
1) Wound infection
2) Herniation of small bowel
3) Bleeding
4) Entrapment of omentum.[8]

Percentage wise the complication s noted in our study were 5.1% in case study and 7.1% in control, there were no intraoperative complications, port site infection was seen in 9.2% in case and 14.3 in control and hernia at port site was seen in 1 laproscopic cholecystectomy which belonged to control group.
All the complications were managed with minimal intervention, and morbidity. Consideration of meticulous surgical technique during closure of the port can minimize these complications. There were 0.14% laparoscopic port site hernias, which is less. But designing a method for port closure, will reduce the incidence still further.

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