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A COMPARATIVE STUDY OF STANDARD IPOM AND IPOM WITH CLOSURE OF DEFECT IN THE LAPAROSCOPIC MANAGEMENT OF INCISIONAL HERNIAS

General Surgery

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ABSTRACT

INTRODUCTION: A ventral hernia is a protrusion through the anterior abdominal wall fascia. These defects can be categorized as spontaneous or acquired. Acquired hernias typically occur after surgical incisions and are therefore termed incisional hernias. Such hernias can occur after any type of abdominal wall incision(1).Although the laparoscopic technique for repairing incisional hernias is well established. However, several issues related to laparoscopic repair of incisional hernia such as the high recurrence rate for hernias with large fascial defects and in extremely obese patients are yet to be resolved. Additional problems include seroma formation, mesh bulging/ eventration, and non-restoration of the abdominal wall rigidity/ function with only bridging of the hernial orifice using standard laparoscopic intraperitoneal onlay mesh repair (s-IPOM). To solve these problems, laparoscopic fascial defect closure with IPOM reinforcement (IPOM PLUS) have been introduced. IPOM PLUS involves closure of the hernia defect by suturing in addition to placement of mesh.

MATERIALS AND METHODS: After obtaining the ethical clearance from the institutional ethical committee,the hospitalbased observational study was conducted in the Department of General Surgery at SMIMER.A total number of 200 patients who underwent laparoscopic management of incisional hernia were included in our study.After preoperative preparation patients were randomized to an intra-corporally sutured closure technique of the hernia gap with IPOM(IPOM PLUS) or to non- closure of the gap and IPOM (Standarprocedure S-IPOM).

RESULTS: The patients were divided into two groups.(GroupA:IPOMPLUS- I pom with closure of defect, Group B: Standard IPOM) and followingobservationsweremade.The average duration of hospital stay in groupA was 4.1±0.4 days while as that in group B was 4.3±0.2 days. The difference however being statistically insignificant. Pvalue >0.05 The mean size of defect in the two groups was4.2±1.4cms in Group A and 4.4±1.8cms in Group B. The difference was however statistically insignificant with a P-value of >0.05.

CONCLUSION: From the observations made in our study, it can be concluded that Closure of defect in laparoscopic management of incisional hernia has definitly advantages over non-closure of the defect.

KEYWORDS

INTRODUCTION

Hernia is derived from the Latin word for rupture. A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. A hernia can be external hernia which protrudes through all the layers of abdominall wall or an internal hernia in which protrusion occurs through a defect in the peritoneal cavity. External abdominal wall hernias can be broadly divided into inguinal and ventral hernias. A ventral hernia is a protrusion through the anterior abdominal wall fascia. These defects can be categorized as spontaneous or acquired. Acquired hernias typically occur after surgical incisions and are therefore termed incisional hernias.Such hernias can occur after any type of abdominal wall incision,although the highest incidence is seen with midline and transverse incisions[1].The incidence of incisional hernia range from 2%-11% (2,3,4). The incidence of incisional hernia occur in the port sites after laparoscopic surgery, lies between 0.02 to 3.6%(5). Approximately 50% of all incisional hernias develop or present within the first 2 years following surgery, and 74% occur within 3 years[2,3]. In the present world with increase in the number of surgeries being performed, the incidence and the concern of incisional hernia is also on rise in our societies. Although the laparoscopic technique for repairing incisional hernias is well established. However, several issues related to laparoscopic repair of incisional hernia such as the high recurrence rate for hernias with large fascial defects and in extremely obese patients are yet to be resolved. Additional problems include seroma formation, mesh bulging/ eventration, and non-restoration of the abdominall wall rigidity/function with only bridging of the hernia orifice using standard laparoscopic intraperitoneal onlay mesh repair (s-IPOM). To solve these problems, laparoscopic fascial defect closure with IPOM reinforcement (IPOM PLUS) have been introduced. IPOM PLUS involves closure of the hernia defect by suturing in addition to placement of mesh.

We performed a study to assess the outcome of IPOM and IPOM plus interms of operation time, seroma formation, mesh bulging, mesh venteration and recurrence.

MATERIALS AND METHODS:

After obtaining the ethical clearance from the institutional ethical committee,the hospital based observational study was conducted in the Department of General Surgery at SMIMER hospital surat. A total number of 200 patients who underwent laparoscopic management of incisional hernia were included in our study.The patients having irreducible hernias; Size of defect>6cm; Patients not fit for general anaesthesia and the patients having recurrent ventral hernia after laproscopic repair were excluded from the study. Diagnosis of a ventral hernia was typically made during the history and physical examination. Imaging studies including ultrasound, computed tomography (CT) with or without valsalva were also used for diagnosis. Imaging studies were helpful to assess the anatomical details of a ventral hernia. After preoperative preparation patients were randomized to an intra-corporally sutured closure technique of the hernia gap with IPOM(IPOM PLUS) or to non- closure of the gap and IPOM (Standard procedure S-IPOM).

SURGICAL TECHNIQUE

1. **Intra peritoneal onlay mesh and closure of gap(intervention group):** The hernia gap is sutured .The hernia sac is incorporated into the sutures. All the layers of abdominalwall except the skin and subcutis are incorporated into the stitches.
2. **Intra peritoneal onlay mesh and non-closure of gap(control group):**The standard surgical technique is without closure of the gap before IPOM fixation with the double crown technique.

The abdominal cavity is insufflated to 12-15 mmHg by veress needle and a10mm trocar is placed along the left side laterally to the mid-clavicular line under the lower left costal margin. Additionally, one 5mm trocar and one 12mm trocar are placed in a vertical line downward. Adhesiolysis is performed as needed. The gap area is cleared for fatty tissue, and the falciform ligament is partially detached from the abdominal wall. The maximum diameter of the gap is measured under a 6-8mmHg intraperitoneal pressure before fixation of the mesh and/or suturing of the gap. A physiomesh is placed with atleast a 5cm over lap of the gap and fixated with double-crown technique. The gap size before closure is used to determine the size of mesh. The hernia content is reduced, without removal of hernia sac. The mesh fixation is performed under a 6-8 mmhg intraperitoneal

pressure with 1.5-2cm distance between tacks. Fascial trocar site defects are closed with interrupted sutures. Skin is closed with single stitch. The patients were instructed to wear the binder continuously for seven days. The patients were first followed up on the seventh postoperative day for dressing and stitches removal. They were subsequently followed up on three months post operatively, and at one year and then after two years. During follow up visits, a clinical examination and ultrasound examination were performed to exclude recurrence of hernia or seromas.

RESULTS AND OBSERVATIONS:

The patients were divided into two groups. (GroupA:IPOMPLUS-IPOM with closure of defect, Group B: Standard IPOM) and following observations were made. Each group comprised of 100 patients. The mean age of patients in IPOM PLUS group was 45±10 years while as in standard IPOM group was 45.5±10.5 years.

The mean size of defect in the two groups was4.2±1.4cms in Group A and 4.4±1.8cms in Group B. The difference was however statistically insignificant with a P-value of >0.05

The average duration of hospital stay in groupA was 4.1±0.4days while as that in group B was 4.3±0.2days. The difference however being statistically insignificant. Pvalue >0.05

GROUP A (IPOM PLUS-IPOM WITH CLOSURE OF DEFECT):- Out of Total 100 patients who underwent IPOM PLUS, only 5 (5%) patient developed seroma posto-peratively, Postoperative ileus was observed in only 5 (5%) patient, none of the patient who underwent IPOMPLUS showed recurrence or Mesh bulging.

GROUP B (S-IPOM- IPOM WITHOUT CLOSURE OF DEFECT):- Out of total 100 patients who underwent S-IPOM, 17 (17%) patients developed seroma formation, Postoperative ileus was seen in 22 (22%) patients, 5 (5%) patient developed recurrence, Mesh bulging was seen in 20(20%)patients.

DISCUSSION:

The evolution of incisional hernia repair has advanced from open primary repair to the application of mesh repair to the laparoscopic approach. Laparoscopic incisional hernia repair was first described by le Blance and Booth. Although the laparoscopic technique for repairing incisional hernias is well established. However, several issues related to laparoscopic repair of incisional hernia are yet to be resolved.We report our experience of the laparoscopic treatment of incisional hernias at our hospital. Our study comprised of 200 patients divided into two groups.The mean follow up period was 2years.

The two groups in our study were:

GROUP A:-Intraperitoneal on lay mesh and closure of gap (intervention group): In this group, The hernia gap is sutured with prolene. All the layers of abdominal wall except the skin and subcutis are incorporated into the stitches. After closure of defect, mesh is placed intraperitoneally.

GROUP B:- Intraperitoneal onlay mesh and non-closure of gap

In our study Group A (IPOMPLUS-IPOM with closure of defect) comprised of 100 patients between the ages of 25 to 65 years (mean age:45±10 years) maximum number of patients were in the age group of 35 to 45 years comprising 35% of group A. While Group B (S-IPOM- IPOM without closure of defect) comprised of 100 patients in age range of 25 to 65 years (meanage: 45.5±10.5years).Most of the patients were in age range of 35- 45 years of age comprising 40% each of group B. P-value was > 0.05.These observations were consistent with EAAg bakwuru et al[4] who found that patients who had incisional hernia were mostly of the reproductive age group with a median age of 35 years and Chandra Kant Paliwal [5] who found that peak incidence of incisional hernia was in 31-50 years of age.

In our study, the mean operative time in group A was 92±5.5 mins. Majority of the patients in group A had operative time in the range of 85-95 mins. The mean operative time in group B was 75±4.10 mins. Majority of the patients had operative time in the range of 65-85 mins. p- value was <0.001. Chandrakant R Kesari [6] also revealed that Operative time for hernia repair with closure of defect was 80 to 100 min and without closure of defect was 50 to 70 min.

In Group A (IPOM PLUS- IPOM with defect closure) The mean post operative hospital stay in days of groupA was 4.1±0.4days , with majority of the patients having hospital stay of 4 days (55%).The hospital stay ranged from 4 day to 8 days. while as in Group B (S-IPOM-IPOM without closure of defect) The mean hospital stay in days of groupB was 4.3±0.2 with majority of the patients having hospital stay of 4 days (70%). The difference being statistically insignificant with a p-value was <0.05.

Out of 100 patients in group A,60 (60%) patients had defect size of 2 to 4 cm,while as 40(40%) patients had defect size of 4 to 6 cm. mean defect size was 4.2±1.4cms.While in GROUPB(S-IPOM),Out of 100 patients, 55(55%) patients had defect size of 2 to 4 cm,while as 45 (45%) patients had defect size of 4 to 6 cm. Mean defect size was 4.4±1.8cms. The difference being statistically insignificant with a P value of >0.05.

Out of 100 patients who under went IPOMPLUS,only 5 (5%)patient developed seroma postoperatively, while in those who underwent S-IPOM, 17 (17%) patients developed seroma formation. P value was >0.05. Postoperative ileus was observed in only 5(5%) patient in group A (IPOM PLUS). while in group B (S-IPOM), 22 (22%) patients developed postoperative ileus. P value was >0.05.No one of the patient who under went IPOM PLUS showed recurrence. While as 5 (5%) patient in S-IPOM group showed recurrence. P value was >0.05. Mesh bulging was also seen in one of the cases of IPOMPLUS. While as It was observed in 20 (20%) patients in S-IPOMgroup. Pvalue being <0.0001.

Although there are not much differences in the complications like seroma formation, post operative ileus, recovery and recurrence upto 2 years.But there was a significant difference in mesh bulging in the two groups.The incidence being 20% in S-IPOM. All these cases were managed conservatively by continuous application of anabdominal binder thus reducing the recurrence to 5% at the end of two years. Nguyen D Hetal [7] reviewed various studies and suggested that primary fascial closure compared to non-closure in LVHR resulted in lower recurrence rates and seroma formation rates which also suggest that IPOM PLUS has got certaina dvantages over S-IPOM in terms of recurrence, meshbulging, seroma formation. However larger studies are required to confirm the obtained results.

CONCLUSION:

From the observations made in our study, it can be concluded that Closure of defect in laparoscopic management of incisional hernia has definitly advantages over non-closure of the defect. It decreases incidence of seroma formation, mesh bulging and recurrence in laparoscopic incisional hernia repairs. There fore, we suggest closure of the defect in all cases of laparoscopic repairs of incisional hernias.

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