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A HOSPITAL BASED OBSERVATIONAL STUDY OF INCISIONAL HERNIA AND ITS MANAGEMENT IN A TERTIARY CARE HOSPITAL OF UPPER ASSAM, INDIA

[1]Dr. Anil Sonkar, [2]Prof. (Dr.) Bijoyananda Das, [3]Dr. Siddhartha Sankar Konwar, [4]Dr. Biswajit Nath, [5]Dr. Nishant Kumar Singh, [6]Dr. Ajay Kumar Kro

[1]Assistant Professor, Department of General Surgery, United Institute Of Medical Sciences Prayagraj, Uttar Pradesh, India
[2]Professor, Assam Medical College and Hospital, Dibrugarh, Assam, India
[3]Assosiate Professor, Lakhimpur Medical College and Hospital, Lakhimpur, Assam, India
[4]Registrar, Dhubri Medical College and Hospital, Dhubri, Assam, India [5]Post graduate trainee, Assam Medical College and Hospital, Assam, India
[6]Associate Professor, Dhubri Medical College and Hospital, Dhubri, Assam, India

Corresponding author: Prof. Dr. Bijoyananda Das, Professor, Dept. of General Surgery, Assam Medical College and Hospital, Dibrugarh, Assam
Email id- bijoyananda4321@gmail.com, ph no. 6001188218
ORCID-0009000665279526

Abstract:

An incisional hernia is a typical long-term consequence of abdominal surgery. The majority of surgeons advise that these hernias be repaired as soon as they are identified. As a result, there was a need to study the disease condition and its many manifestations, as well as to assess the level of awareness among the patients who came to us and to decide the appropriate treatment modality in our facility.

The following operative procedures were adopted in our study:

1. Prosthetic mesh repair (onlay)
2. Anatomical suture repair
3. IPOM
4. Open PCST

In our study the age of the patient ranges from 25 years to 70 years. The mean age was 48.36 years (SD± 11.00).

In our present series of 36 cases of incisional hernia, 23 were female patients (63.89%) and 13were males (36.11%). The male: female ratio was found to be 1: 1.76.

Laparotomy were a major contributing procedure for Incisional hernia comprising of 21 (58.3%) cases out of 36 Incisional hernia cases, followed by gynecological operations 12(33.4%) cases, 2(5.6%) case of Open Cholecystectomy and 1(2.8%) case of Open Appendicectomy. Out of gynecological surgeries, major contributing surgeries were LSCS 10(27.8%) cases, Hysterectomy 2(5.6%) cases.

Incisional hernias have a maximum diameter of the hernial defect in our study 12 cm. 2

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cases of small incisional hernias were repaired by IPOM. There were 36 cases of incisional hernia comprising whose maximum diameter of the hernial sac is between 5 to 10 cm. 30 of these cases were repaired by open onlay mesh repair. In these cases, laparotomy followed by adhesiolysis, reduction of content, onlay mesh placement and closure of abdominal incision with suture was done. There was one case of incisional hernia whose diameter was more than 12 cm where open PCST was attempted with sublay mesh repair.
Post operative complications: seroma (4 cases), surgical site infection (4 cases)

Introduction:

Incisional hernia is one of the most common postoperative complications after abdominal surgery. Several studies have shown that incisional hernias have different etiologies which are related to the patient, the surgical technique, the suture material and experience of the surgeon. Most patients present with abdominal swelling with some level of discomfort, and in emergency the presentation is usually as bowel obstruction or strangulation which requires urgent exploration. The recurrence rate is almost the same for open as well as for laparoscopic approach.

Although a wide variety of surgical procedures have been adopted for the repair of incisional hernia, but prosthetic mesh repair has revolutionized hernia surgery with the concept of tension free repair which remains the most efficient method of dealing with incisional hernia. Prosthetic mesh can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (onlay mesh repair) as well as in the preperitoneal plane created between the rectus muscle and posterior rectus sheath (sublay mesh repair).

Materials and methods:

Place of study: This study was conducted in Assam Medical College and Hospital, Dibrugarh, Assam

Duration of study: The duration of the study was one year (June 2019 to May 2020).

Type of the study: Prospective Observational Study.

Aim: The purpose of the study is to know the proportion of incisional hernias in both sexes, various age groups, various risk factors, consequences of various hernias, clinical presentation, and treatment options.

Sample size of study population: The total number of cases studied in this series was 36 cases of Incisional hernia admitted to the Assam Medical College and Hospital, Dibrugarh, Assam. Data was collected regarding patient's age, sex, clinical features, associated risk factor, size of the hernial defect, type of repair and complications if any. In the present series, the age of the patient ranges from 25 years to 70 years. The mean age was 48.36 years (SD± 11.00).

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Inclusion Criteria: All patients age more than 12 years of incisional hernia caused by

1. Laparotomy
2. Caeserean section
3. Tubectomy
4. Hysterectomy
5. Nephrectomy
6. Laparoscopic surgeries

Exclusion Criteria:

1. Patients with strangulated hernia and incarcerated hernias, intra abdominal malignancies.
2. Patients with severe co-morbid conditions like severe cardio-pulmonary diseases, uncontrolled ascites.
3. Pregnant women with incisional hernia.

Ethical clearance: Ethical clearance was obtained from Institutional Ethics Committee (H) of Assam Medical & Hospital prior to the conduction of the study.

Consent: Written and informed consent was taken from each and every participant of the study.

Data Collection Methodology:

1. Primary data.
2. Secondary data: obtained from OT record and daily monitoring notes from patient case record file.
3. Data collection tools: Data collection proforma was used. When required, the corresponding surgeonwas enquired about missing data.

Data analysis method:

Data from the entire study were collected and analyzed in Microsoft Excel sheet 2010. Categorical variables were summarized as proportions and percentages. Results on continuous variables are presented as mean±standard deviation. Standard statistical tools were used and presented in the form of tables, graphs, and figures.

Management protocol:

1. A thorough examination of operation records were done. All the patient underwent preoperative preparation followed in our institution, which are mentioned below:

a.The diagnosis was made by relevant clinical history, detailed clinical examinations and imaging modalities.

b. Patients were explained about their diagnosis and counseled about the required surgical corrections and need to undergo a hernia repair procedure. Feasibility and complications of the procedures in details were discussed with the patient.

c. In cases where bowel was part of the content of hernia sac and there was a possibility of bowel being opened, bowel preparation was done as a precautionary measure.

The following operative procedures were adopted in our study:

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1. **Prosthetic mesh repair (onlay)**
2. **Anatomical suture repair**
3. **IPOM**
4. **Open PCST**

These procedures are described below:

1.Prosthetic mesh repair (onlay):

Prolene mesh was placed as an onlay graft on the outer surface of the rectus sheath and external oblique aponeurosis and muscle leaving at least 3 -5 cm from the edges of the hernial defect in all direction. The edges of the mesh were fixed to the anterior rectus sheath with interrupted prolene suture. Two vacuum drains were inserted through two separate wounds. Redundant skin and fat were excised and the incision is closed with interrupted ethilon (Nylon) or vicryl rapide (Polyglactin 910 undyed braided absorbable) suture.

However, there were two emergency cases of obstructed ventral hernia one incisional and the other was paraumbilical. In these two cases, the mesh was not applied. The rest of the operative procedure was the same as described above.

2. Suture repair:

This technique was applied in the repair of epigastric hernias. All these hernias were sacless and extraperitoneal fat protrudes through the defect in the linea alba. A vertical incision was given over the bulge. After retraction of the skin, protruding extraperitoneal fat was seen through the defect in the linea alba. Extraperitoneal fat was reduced through the defect in the linea alba. The defect was closed with interrupted prolene suture. Skin was closed using interrupted ethilon or vicryl rapide.

3.Laparoscopic IPOM repair:

This technique was applied for the repair of two incisional hernia. First, a 12 mm port was created using open method, 5cm below the left costal margin in the midclavicular line on the left side. Next, two 5mm ports were created under direct vision laterally along the anterior axillary line on the same side. Later on, another 5mm port was created on the right side in the level of the umbilicus on the anterior axillary line for the fixation of the mesh.

Reduction of hernia contents was performed using blunt graspers and sharp dissection from the inside was facilitated by manual compression from the outside. Four layered proceed mesh is tailored to overlap all the margins of the hernial defect by at least 5 cm.

The perimeter of the mesh is attached to the peritoneum with tacks, at approximately 1cm interval. Placing the tacks was facilitated by external manual palpation at the tacker's tip.

4.Open PCST (Posterior Component Separation Technique):

The hernial sac and peritoneum were mobilized from the fascial hernial ring, from the posterior rectus sheath bilaterally and from the linea alba in the midline. The two edges of the hernia sac along with theposterior rectus sheath were approximated in the midline using continuous PDS (monofilament polydioxanone) suture. Large size PROCEED mesh was placed above the posterior rectus sheath and fixed with interrupted prolene suture.

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Prosthetic material used:

PROCEED mesh: A macroporous, partially absorbable, tissue-separating mesh. It has four layers from parietal to visceral side:

- PDS® (polydioxanone) Suture polymer film
- PROLENE® Soft Polypropylene Mesh
- PDS® (polydioxanone) Suture polymer film
- Oxidized regenerated cellulose (ORC) knitted fabric

AbsorbaTack™: ™: The AbsorbaTack™ 5mm fixation device is a sterile, single-use device for fixation of prosthetic material, such as hernia mesh, to soft tissue. The tack is constructed of an absorbable synthetic polyester copolymer derived from lactic and glycolic acid dyed with D&C Violet no 2. Tacks are screw-shaped with a smooth head and proximal wings.

Anesthesia: All the operations were performed under general anesthesia.

Post-operative care:

The patient was covered with a course of intravenous antibiotics. Ceftriaxone and amikacin were added where prosthetic mesh was implanted. Those patients who presented with intestinal obstruction were given intravenous piperacillin and tazobactam and metronidazole. Proton pump inhibitors and ondansetron were added to avoid nausea and vomiting and to keep the intra-abdominal pressure minimal. Adequate analgesia was achieved with diclofenac 50mg IM twice daily for the first 2 postoperative days. Afterward, oral diclofenac was given on an SOS basis. Fluid and electrolyte balance was maintained by intravenous fluid for the first 2-3 postoperative days in those cases where bowel handling occurred during the reduction of the hernial sac. Nasogastric aspiration was done in those cases who presented with intestinal obstruction. In epigastric hernia cases where no peritoneal sac was involved, oral intake was allowed after the return of bowel sounds during the post-operative period. In most of the patients oral feeding was started from the second day of operation, at first with liquid diet and gradually a normal diet was given. Most of the patients were discharged fromthe hospital in 10 to 14 days.

Follow up:

1. Immediate postoperative complications during the hospital stay to the time of discharge: seroma, hematoma, surgical site infection, skin necrosis, sinus formation, mesh infection and duration of hospital stay.
2. After discharge from the hospital, the patients were followed up after 2 weeks and after one month tosee any recurrence, wound status, and wound site pain.

Results:

Age distribution:

In the present series, the age of the patient ranges from 25 years to 70 years. The mean age was 48.36 years (SD± 11.00). The highest occurrence of incisional hernia was observed in the 5th decade comprising of 14 out of 36 cases (38.9%).

Among 36 incisional hernia patients, most cases were found in the 5th decade (14/36,

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38.9%) followed by 6th decade (10/36, 27.8%) 4th (5/36, 13.9%), 7th (4/36, 11.1%). 3rd (3/36, 8.3%) decade respectively. The mean age±SD for incisional hernia, was 48.36±11.00.

Sex distribution:

In our present series of 36 cases of incisional hernia, 23 were female patients (63.89%) and 13 were males (36.11%). The male: female ratio was found to be 1: 1.76.

Among the 36 cases of Incisional hernia, female predominance was observed with 23 (63.89%)cases were female and 13 (36.11%) were male patients with a male: female ratio of 1:1.76.

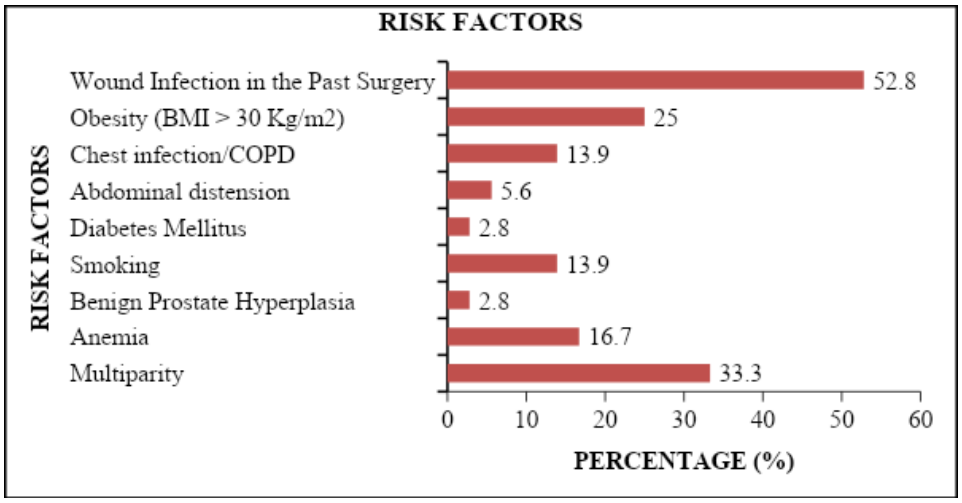
Clinical presentation:

In our study, all 36 (100%) cases presented with swelling in the anterior abdominal wall 5(13.89%) cases presented with pain.

In our study most common symptom that patient presented was swelling in abdomen. 13.89% ofthe patient had associated pain in swelling or dragging type of pain abdomen.

Risk factors:

FIGURE 1 : RISK FACTORS



In our present study there were 36 cases are of Incisional hernia of which 19 (52.8%) cases had history of wound infection in previous surgery, obesity was found to be associated in 9 (25.00%) cases, 5 (13.9%) cases had chest infection / chronic obstructive pulmonary disease (COPD), history of Diabetes Mellitus was found associated with 1 (2.8%) cases, Anemia was found in 6 (16.7%) cases, 5 (13.9%) cases having history of cigarette smoking and 1 (2.8%)cases suffered from benign hyperplasia of prostate with obstructive uropathy.

As per our present study, incisional hernia found in most of the cases with previous history of surgery with post–op wound infection occurred in 19(52.8%) cases, multiparity is associated with 12(33.3%) cases, obesity was found in 9 (25.00%) cases, chest infection / COPD 5 (13.9%), diabetes mellitus 1 (2.8%)

case, smoking 5 (13.9%) cases, anemia 6 (16.7), abdominal distension 2 (5.6%) and BPH 1

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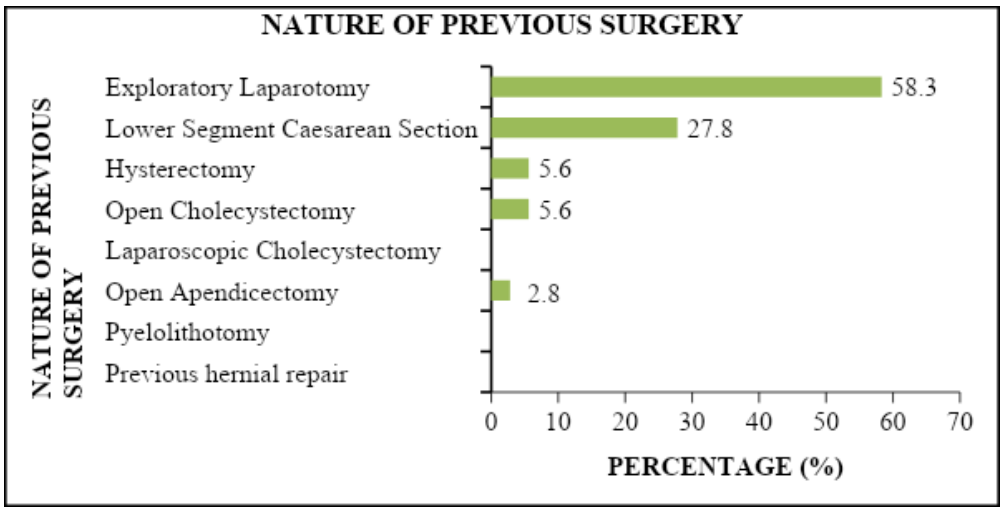
(2.8%) case.

Type of previous surgery in case of incisional hernias:

FIGURE 2: TYPE OF PREVIOUS SURGERY IN CASE OF INCISIONAL HERNIAS



In our study laparotomy were a major contributing procedure for Incisional hernia comprising of 21 (58.3%) cases out of 36 Incisional hernia cases, followed by gynecological operations 12(33.4%) cases, 2(5.6%) case of Open Cholecystectomy and 1(2.8%) case of Open Appendicectomy. Out of gynecological surgeries, major contributing surgeries were LSCS 10(27.8%) cases, Hysterectomy 2(5.6%) cases.

Size of the hernial defect and treatment:

FIGURE 3: SIZE OF DEFECT (HERNIA)

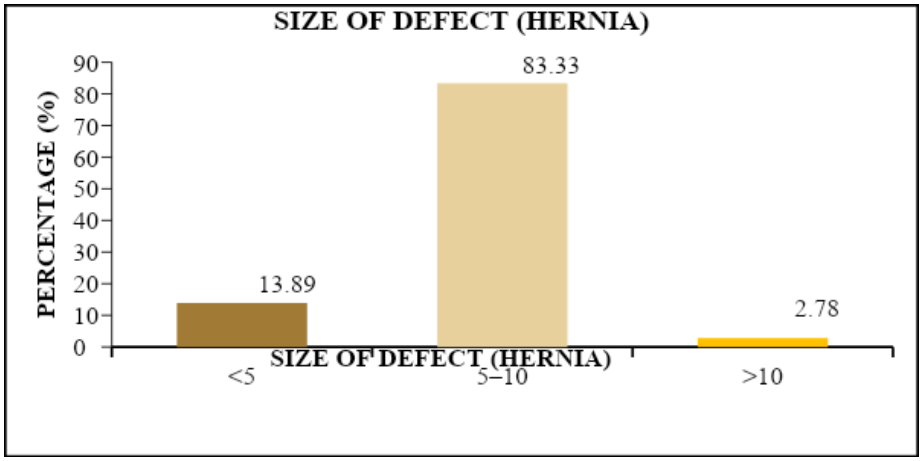


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TABLE 1: SIZE OF DEFECT (HERNIA)

SIZE OF DEFECT (HERNIA)	NUMBER *(n)*	PERCENTAGE	SURGICAL PROCEDURES
<5	5	13.89	Suture Repair, IPOM
5–10	30	83.33	Onlay Mesh repair, Suture repair
>10	1	2.78	Open PCST
TOTAL	36	100.00	

Incisional hernias have a maximum diameter of the hernial defect in our study 12 cm. 2 cases of small incisional hernias were repaired by IPOM. There were 36 cases of incisional hernia comprising whose maximum diameter of the hernial sac is between 5 to 10 cm. 30 of these cases were repaired by open onlay mesh repair. In these cases, laparotomy followed by adhesiolysis, reduction of content, onlay mesh placement and closure of abdominal incision with suture was done. There was one case of incisional hernia whose diameter was more than 12 cm where open PCST was attempted with sublay mesh repair.

TABLE 2: SURGICAL REPAIR PROCEDURE

SURGICAL REPAIR PROCEDURE	NUMBER *(n = 37)*	PERCENTAGE
Onlay Mesh Repair	30	83.33
Suture Repair	3	8.33
IPOM	2	5.56
Open PCST	1	2.78

Postoperative complications:
Seroma: 4 cases
Surgical site infection: 4 cases

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TABLE 3: POSTOPERATIVE COMPLICATIONS

POSTOPERATIVE COMPLICATIONS	NUMBER *(n* = 36*)*	PERCENTAGE
Seroma	4	11.11
Surgical Site Infection	4	11.11
Mesh infection	0	0.00

Duration of hospital stay:

The average postoperative hospital stay of all the patients was 9.25±4.06 days. The maximum hospital stay was 18 days and the minimum was 3 days. IPOM cases and suture repaired incisional hernia cases had minimum hospital stay. Those cases with surgical site occurrence were observed to have longer hospital stays.

Follow up:

At the time of discharge from the hospital, the patients were advised to attend our follow-up clinic at an interval of 2 weeks and one month. More follow-up could not be done for the limited period of the study. The first follow-up after 2 weeks was attended by 36 (100%) patients and the second follow-up after one month was attended by 24 (66.67%) patients. In the follow-up period, the 4 patients who had developed surgicalsite infections underwent secondary suturing and closure of the wound. 2 patients complained of foreign body sensation from the implanted mesh in the first follow-up. However, they did not have any other complaints in the next follow up. No recurrence was observed during the limited period of the study.

TABLE 4: FOLLOW UP

FOLLOW UP	NUMBER *(n* = 36*)*	PERCENTAGE
1st Follow up (at 2 weeks)	36	100
2nd Follow up (at 1 month)	24	66.67

Conflict of interest- nil

Conclusion:

Proper preoperative preparation of the patient, tension-free repair of the hernia defect, asepsis during the perioperative period, address of comorbidities results in good outcomes in hernia repair surgeries. In our study, short term outcomes were satisfactory with only 4 patients suffering from surgical site occurrence. Owing to the short period of follow-up (1month) in our study, no comment can be made about the

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recurrence rates. The average postoperative hospital stay of all the patients was 9.25±4.06 days. The maximum hospital stay was 18 days and the minimum was 3 days. IPOM cases and suture repaired incisional hernia cases had minimum hospital stay. Those cases with surgical site occurrence were observed to have longer hospital stays.

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ABBREVIATIONS

□	BPH	:	Benign prostate hyperplasia
□	COPD	:	Chronic obstructive pulmonary disease
□	DASH	:	Dynamic abdominal sonography for hernia
□	ePTFE	:	expanded polytetrafluoroethylene
□	eTEP	:	enhanced-view totally extraperitoneal
□	eTEP-RS	:	Extended totally extraperitoneal Rives-Stoppa
□	eTEP-TAR	:	Extended totally extraperitoneal transversus abdominis release
□	IPOM	:	Intraperitoneal onlay mesh
□	MIS	:	Minimally invasive surgery
□	OVHR	:	Onlay ventral hernia repair
□	PCST	:	Posterior component separation technique
□	TAP	:	Transversus abdominis plane