

# Complications of Repair of Incisional Hernia Using Polypropylene Mesh

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**Objective:-** To find out frequency and type of complications after repair of incisional hernia using polypropylene mesh.

**Design:-** It is a descriptive type of study. **Place and duration of study:-** This study was conducted in surgical Unit-I and Surgical Unit II Nishtar Hospital Multan from March 2003 to February 2005. **Patients and method:** After admission of the patient a detailed history, thorough physical examination was done and a proforma filled containing information about previous operation. Investigations like complete blood examination, complete Urine examination, random blood sugar level, X-ray chest, ultrasound were performed and patients put on the operation list. Polypropylene mesh placed in retromuscular plane and patients were observed for complications. **Results:-** Male to female ratio was 1:1.85. Age varied from 14-70 years. 32 patients (80%) were between the age of 31-60 years. 6 patients (15%) were between the age of 20-30 years. 2 patients (5%) were between the age of 61-70 years. The approximate time interval between the initial operation and appearance of hernia, predominantly in all 40 patients was within first year following surgery, in fact 27 patients developed incisional hernia within first 3 months, incidence decreased gradually over subsequent years. The most common presentation was protrusion of abdomen in all patients (100%) followed by vague abdominal discomfort in 36 patients (90%) and dragging pain at hernia site in 16 patients (40%). All patients underwent repair of incisional hernia using polypropylene mesh which was placed in retromuscular preperitoneal position. Complications occurred were wound infection in 4 patients (10%), serum collection in 2 patients (5%), prolonged ileus in 2 patients (5%), sinus formation in only 1 (2.5%), hernia recurrence in 1 patient (2.5%). There was no mortality in study. Patients were followed up at 3 weeks, 6 weeks, 3 months, 6 months and 12 months. **Conclusion:-** Mesh repair was found very effective method of dealing with incisional hernia.

**Key words:-** Paraumbilical hernia, mesh repair, incisional hernia.

Complications detrimental to patient's long term welfare are sometimes the unwelcome sequelae of surgical intervention. Incisional hernia fall nicely into this category.

Incisions in abdominal wall are because of its function as a dynamic corset for abdominal organs and as a muscle of respiration, defecation and micturation, subject to more distractive forces than those in any other part of body. An incisional hernia is defined as "Defect in the scar tissue which could be detected by clinical examination". It is truly iatrogenic and starts as a symptomless partial disruption of deeper layer of previous incision due to surgery done in the past or during early postoperative period. As a matter of fact, this is a possible complication faced by every general surgeon and gynaecologist<sup>1</sup>.

Incidence of incisional hernia following abdominal surgery ranges from 1% to more than 10% despite advances in operative technique, improved suture material, better pre and postoperative care, use of reinforcement material and antibiotics, this iatrogenic hernia does not seem to be significantly reducing in frequency. It is an uncomfortable and often a painful disability from patient's point of view. The use of non- absorbable suture has reduced the incidence of incisional hernia but still rate of recurrence remains very high.

Most often cause of recurrence is regarded as tissue failure<sup>2</sup>. It is proposed that repair should be delayed for at least one year after the operation that caused the hernia or after a previous attempt of repair. This is the time taken for

the collagen to mature and for the tissue to reach their final dry state. One should wait for at least one year after all the infection and sinuses have healed. But this is not true in case of emergency surgery where patient presents with strangulation<sup>3</sup>.

As a result of high recurrence rate in the repair of incisional hernias various techniques have been used. These include anatomical repair, keel operation, repair of huge hernia with the help of skin, fascia lata, by allogenic material like tantalum and lastly by synthetic material like nylon, polyester (mersilene) and polypropylene (marlex) where it was not possible to close the defect in the anterior abdominal wall without tension.

Study about mesh repair in Pakistan is still limited, international data gives a very low recurrence rate in mesh implantation. This is a prospective study of 40 patient in which repair of incisional hernia was done, using polypropylene mesh; this study tells us about the type of complications, frequency of complications, which can occur after the repair of incisional hernia with mesh.

## Patient and method:

Forty patients of either sex of Incisional Hernia were selected according to following criteria.

1. Incisional hernia with gap more than 4cm.
2. Age between 14-70 years.
3. History of previous surgery at least 1 year ago.



After admission of the patients, a detailed history, thorough physical examination was done and a proforma filled containing information about previous operation whether elective or emergency, interval between last operation and appearance of incisional hernia, type of previous incision, any concomitant disease like diabetes, prolonged steroid therapy, malignancy history of wound infection and wound dehiscence.

Investigations like complete blood examination, complete Urine examination, random blood sugar level, X-ray chest, Ultrasound were performed and patients were put on the operation list.

**Operative Technique:** Following operative technique was adopted after skin preparation with povidone iodine. An elliptical incision given to include the previous cutaneous scar. Skin flap raised and scar tissue excise. A sac was dissected free from the surrounding tissue and the margin of defect was clearly defined. The peritoneum closed and polypropylene mesh placed in a retromuscular position i.e. preperitoneal. A double layer of the mesh extending 3 cm beyond the margin of defect was cut and placed over the peritoneum with prolene No.2/0. The anterior rectus sheath closed with prolene No.1. After placing a drain on the prolene mesh through a separate stab incision. In majority of the patient, the drain remained till drainage was minimal (5-10ml in 24 hours) duration varying 2-3 days.

Prophylactic antibiotics were given and continued for at least 24-72 hours postoperatively. The average postoperative hospital stay was 7-10 days. After discharge from hospital patients were followed up after 3 weeks, 6 weeks, 3 months, 6 months and 1 year.

**Results:**

This study of repair of incisional hernia using polypropylene mesh consisted of 40 patients – of these 26 (65%) were females and 14(35%) were males. Male to female ratio was 1:1.85 as shown in Graph-I.

Age varied from 14-70 years. 32 patients (80%) were between the age of 31-60 years. 6 patients (15%) were between the age of 20-30 years. 2 patients (5%) were between the age of 61-70 years (Graph-II).

Table I shows initial operative procedure responsible for incisional hernia formation.

Table-II shows, the details of approximate time interval between the initial operation and appearance of hernia, predominantly in all 40 patients, during the first year after surgery.

The presenting clinical features are summarized in table-III. The most common presentation was protusion of abdomen in all patients (100%) followed by vague abdominal discomfort in 36 patients (90%) and dragging pain at hernia site in 16 patients (40%).

Table-IV depicts the incidence of potential risk factor for development of incisional hernia in various patients.

Table-V shows the type of incision which resulted in incisional hernia.

Postoperative complication of mesh repair are shown in table VI.

Wound infection occurred in 4 patients (10%). All the four patients developed infection in early post operative period (within one week). These were treated with appropriate antibiotics after culture and sensitivity of discharge from wound.

In 2 patients(5%) serum collection occurred on 5<sup>th</sup> and 6<sup>th</sup> operative day due to accidental removal of a drain in one patient and blockage of suction drain in the other patient. It was aspirated with wide bore needle and sent for culture and sensitivity but found to be sterile. No further treatment was needed for this complication.

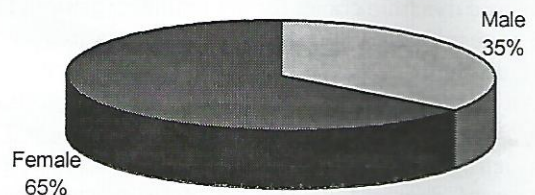
Prolonged ileus occurred in two patients (5%). Both of them were treated with nasogastric aspiration for 5-6 days postoperatively and by correction of electrolyte imbalance.

Wound sinus formation occurred in only 1 patient. It healed spontaneously and was not necessary to remove the mesh.

Hernia recurrence was found in 1 out of 4 patients who develop wound infection after mesh implantation. The infection settled after wound was irrigated with appropriate antibiotic according to culture and sensitivity but ultimately led to recurrence.

There was no mortality in this study.

Graph 1: Sex distribution



Graph II: Age relation

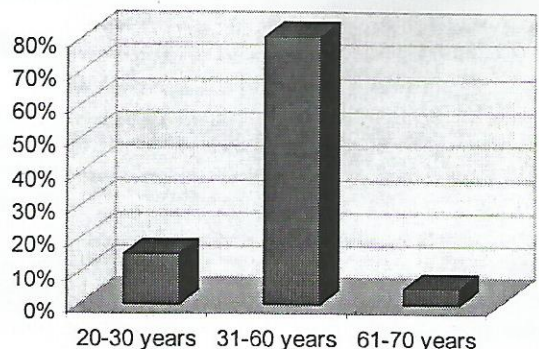




Table I: Previous operations resulting in incisional hernia

Previous operation	n=	%age
Laparotomy	24	60.0
Emergency	21	52.2
Elective	03	07.5
Repair of paraumbilical Hernia	06	15.0
Appendectomy	06	15.0
Lower segment caesarian section	02	05.0
Cholecystectomy	02	05.0

Table II: Approximate time interval between previous operation and incisional hernia

Duration	n=	%age
1 - 3 Months	27	67.5
4 - 6 Months	10	25.0
7 - 9 Months	-	-
10 - 12 Months	03	07.5

Table III: Clinical presentation of patients with incisional hernia

Clinical feature	n=	%age
Protrusion of abdominal wall	40	100.0
Vague abdominal Discomfort	30	90.0
Dragging Pain	16	40.0

Table-IV Risk factors contributing to incisional hernia

Risk factors	n=	%age
Wound Infection	25	62.5
Emergency laparotomy	12	30.0
Obesity	08	20.0
Burst Abdomen	07	17.5
Diabetes	03	07.5
Chronic Lung Disease	01	02.5

Table-V: Type of previous incisions causing incisional hernia

Type of incision	n=	%age
Midline		
Lower	11	27.5
Upper	02	05.0
Upper and lower	05	12.5
Paramedian		
Right	06	15.0
Right subcostal (Kocher's)	02	05.0
Transverse		
Midabdominal	06	15.0
Lowerabdominal	02	05.0
Gridiron	06	15.0

Table-VI: Postoperative complications of incisional hernia repair with mesh implantation

Complications	n=	%age
Wound Infection	4	10.0
Seroma Formation	2	05.0
Paralytic ileus	2	05.0
Sinus Formation	1	02.5
Hernia Recurrence	1	02.5

### Discussion:

Incisional hernia is caused by deficient wound healing from the very beginning or by gradually yielding of an apparently soundly healed wound.

Incisional hernia should be repaired unless the patient is unable or unwilling to undergo surgery as hernia increases in size and may cause pain. There are many known factors which can lead to the development of Incisional hernia apart from the deficient wound healing. Factors contributing towards the aetiology and pathogenesis of Incisional hernia include type of incision, choice of suture material i.e. absorbable or non absorbable, technique of closure i.e. layered or mass closure and method of suturing i.e. continuous or interrupted. Some factors not easily manipulated include obesity, diabetes, anemia, malnutrition concurrent medical illness and prolonged steroid therapy and malignancy.

From literature<sup>4</sup> it is seen that Incisional hernia occurred more frequently between 30-60 years age group and female have higher frequency than males with a ratio of 2.4:1. In this study majority of 32 patients (80%) were in the 31-60 years age group with female to male ratio 1.85:1.

The transverse incisions are mechanically stronger than vertical incision, so incisional hernia occurs less commonly in transverse incision. In this study, 15% of incisional hernias were due to transverse incision while Incisional hernias were more in vertical incision.

Paramedian incision are thought to be safer than midline incision against Incisional hernia<sup>5,6</sup>. This study also indicates that incidence of Incisional hernia occurring through paramedian incision was only 15% as compared to that of hernias occurred through midline incision which is 45%.

Postoperative complication recorded in this study includes wound infection. It has been seen that mesh repair of Incisional hernia has higher rate of infection than other clean general surgical procedure. Rios A and his colleagues noticed that in patient undergoing surgery for Incisional hernia, infection rate for patients not receiving prophylactic antibiotics was almost twice (21%) the rate for those receiving antibiotics (11%). As the patients were given prophylactic antibiotics according to the records, the results of our study are comparable to Rios A et al<sup>7</sup>.

Seroma formation occurred in only 2 patients(5%) in this study. In a study by Langer et al, there is seroma formation in about 5.2% to which our results are comparable<sup>8</sup>.

Paralytic ileus due to vigorous handling of viscera, which occurred in 2 patients (5%). According to study carried out by Leber et al<sup>9</sup>, it is comparable to the literature.

Wound sinus formation occurred, in this study, in only one patient (2.5%). That is comparable to 2.2% occurrence of wound sinus in a study carried out by Turcpar et al<sup>10</sup>.

In our study, the recurrence of incisional hernia occurred in one patient (2.5%). The recurrence rate of Incisional hernia repair with primary suture repair is 43%

(67) and recurrence rate with polypropylene mesh repair is low according to Khaira et al<sup>11</sup> it is 6%.

The use of polypropylene mesh since 1958 has been the most widely used prosthetic material to bridge large defects between scar tissue and create a tension free reconstruction and seems to have reduced the incidence of recurrence. In another study, the recurrence after mesh repair is 2.4%<sup>4</sup> and thus our results are almost comparable to the international data.

Study about mesh repair in Pakistan is limited. International data gives a very low recurrence with mesh implantation<sup>4</sup>.

**Conclusion:**

This study is limited to 40 cases but it still proves that mesh repair is very effective method of dealing with incisional hernia. So in my opinion mesh repair should be undertaken in all cases of giant and recurrent incisional hernias. The repair should be delayed for one year after surgery or repair. Emphasis should be given to thorough pre-operative preparation to manage the risk factors before surgery and adequate postoperative care to reduce the risk of wound infection, seroma formation and recurrence.

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