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INTRAPERITONEAL MESH PLASTY

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ABSTRACT... Background: Incisional hernia is a common surgical condition with a reported incidence of 2-11% following laparotomy. Various Modalities of Repair have been advocated but the overall results still remain disappointing. **Objective:** To evaluate in incisional Hernias the efficacy and safety of Intraperitoneal mesh repair with conventional Polypropylene Mesh. **Setting:** In CMH Muzaffarabad, CMH Sialkot and PAC Hospital Kamra. **Period:** From January 2000 to January 2007. **Materials & Methods:** 90 cases of Incisional hernia with a minimal defect size of 4 inches were included; there was no limitation to age and sex. Patients with Co morbid conditions like Diabetes Mellitus, Hypertension, Bronchial Asthma, and Ischemic Heart Disease etc: were also included if there was no other contraindications for Surgery. Observations were made with regard to duration and ease of the operation, wound complications, hospital stay, recurrence and delayed complications. **Results:** In our series of 90 patients, Females (92.22%, n= 83) outnumbered males (7.77%, n=7) and the highest incidence was in the 4th decade of life in females and the 3rd decade of life in males. Gynecological operations accounted for 61.44% (n=51) of the index operations. 77.7% (n=70) of patients had a BMI >30. Co morbid Conditions were present in 36.66% (n=33) of patients. The polypropylene mesh placed Intra peritoneal varied from 15×7.5 cm to 30×20 cm. The mean operating time was 60±20 minutes; operating time was extended when the procedure was accompanied by Dermolipectomy 80±10 minutes. 85.55% patients (n=77) attended our follow-up, ranging from 12 months to five years. Method of follow-up in outpatients department (OPD)/Clinics: 71.11%(n=64), by telephonic conversation: 12.22%(n=11). 14.44% (n=13) were lost in follow up. All patients in followup had serial abdominal sonograms at 3, 6, 9 and 12 months postoperatively respectively to evaluate bowel motility, adhesion formation and any locally associated complication. No recurrence was noted in the follow-up group. **Conclusions:** Historically intraperitoneal Mesh placement of conventional polypropylene has been avoided as it was associated with significant postoperative complications. Based on our analysis, we believe that intraperitoneal mesh repair is still an effective option for Incisional hernias, especially in difficult cases and with patients having co morbid conditions. The associated high incidence of complications associated with intraperitoneal mesh placement in the literature were not seen in our experience.

Key words: Incisional hernia, intraperitoneal mesh repair, effective procedure.

INTRODUCTION

Incisional hernia occurs through an operative scar. It is the only hernia considered to be iatrogenic. It occurs due to the failure of the lines of closure of the abdominal wall following laparotomy. An incisional hernia occurs when all the layers except the skin, fail to heal. Incisional hernia is one of the most common conditions requiring major surgery[1]. The reported incidence in literature is 2-11% following laparotomy[1].

Historically, incisional hernias have been repaired with either primary suture techniques or placement of a variety of prosthetic materials. Before the 1960's, most ventral hernias were repaired primarily with suture and a few with metallic meshes. Even with some modifications, recurrence rates with the primary suture repair ranged from 24-54%[3]. The introduction of polypropylene mesh repair by Usher in 1958 opened a new era of tension-free herniorrhaphy. Recurrence rates with prosthetic mesh decreased to 10-20%[1]. Subsequently, it was realized that the placement and fixation of the mesh was more crucial in determining the outcome of the repair.

The placement of the mesh in the preperitoneal, retro muscular position with a wide overlap of at least 5 cm

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over the hernia defect in all directions was introduced in the late 1980's. The refinement of this method decreased the recurrence rates to as low as 3.5%[3] making it to be most popular repair of ventral hernias. However implantation of the mesh by open techniques requires wide dissection of soft tissue predisposing to an increase in wound infection and wound related complications, but the best position for inserting the material has not been conclusively established[7,12].

Polypropylene mesh has long been regarded as the implant of choice for repairing abdominal wall defects, there is still controversy regarding the best site of its placement. Intraperitoneal placement of conventional polypropylene mesh fell out of favor when significant late complications were reported, like visceral injury with fistula formation, and significant abdominal adhesions and mesh migration. The advent of Dual layered meshes like Vypro (Ethicon) offers a considerable advantage over the conventional polypropylene mesh however the price and availability remain major issues. The present study aims at highlighting that the complications historically associated with intraperitoneal mesh placement[13,14] may not stand true.

MATERIALS AND METHODS

A seven-year study of Intraperitoneal mesh repair was done from January 2000 to January 2007. In all, 90 intraperitoneal mesh repairs were done. The patients included were random and do not represent any specific geographical distribution, race and caste. There were no specific inclusion criteria, no discrimination for age and sex, Patients were included on first come first serve basis, Patients with Co morbid conditions were also included unless there was any other contraindication for surgery. The data and details of 90(100%) patients were maintained. A computerized database was created for all these patients. The following criteria were assessed:

1: Ease and duration of operation
2: Wound complications
3: Hospital Stay
4: Delayed Mesh associated complications

85.55% patients (n=77) attended our followup. Details were entered in our database and results were statistically analyzed. Serial abdominal ultrasound was done at 03, 06, 09 and 12 months to assess the movement of the bowel, assess adhesion formation and local collections.

RESULTS

Ninety patients underwent intraperitoneal mesh repair of incisional hernia during the seven-year study period. Females 92.22%, (n=83) outnumbered males 7.77 %, (n=7) .The youngest patient was 29 years old and the eldest was 70 years old. The age at presentation of the hernia was 42±05 years in females and 32±05 years in males, and was less than in the females. Ref table II.

77.77%(n=70) patients had a BMI > 30 emphasizing the fact that obesity is also an important predisposing factor. 36.66%(n=33) patients had Co-Morbid conditions inclusive of hypertension, Diabetes Mellitus, Ischemic Heart Disease, and Bronchial Asthma, they were operated once they were considered fit for surgery. The results show that Co-Morbid conditions did not significantly contribute to postoperative complications and recurrence(Table IV).

In Our study the main presenting complaint was a swelling (90%, n=81) in the vicinity of the previous operative scar. The other main presenting symptoms were pain (38.88%, n=35) and irreducibility (12.22%, n=11). Of the 90 patients, 16.66%(n=15) had previously underwent incisional hernia repairs.

An index operation is the previous surgery, which resulted in the incisional hernia.

In Females the duration of presentation since the previous surgery was 06±02 years(Table III).

Gynecological operations accounted for 67.77% (n = 61) of our incisional hernias.

Table-I. Hernial site distribution		
Site /Incision	**n=90**	**%age**
Midline	70	77.77%
Pfannenstiel	12	13.33%
Subcostal	03	03.33%
Lumbar	02	02.22%
Rutherford Morrison	02	02.22%

Table-II. Age Distribution				
Age group	**Males (n=7)**	**%age**	**Females (n=83)**	**%age**
20-29 years	01	14.28%	04	04.81%
30-39 years	04	57.14%	20	24.09%
40-49 years	02	28.57%	53	63.85%
50-59 years	-	-	05	06.02%
60-70 years	-	-	01	01.20%
Average Age Presentation Males: 35 Years *Average Age Presentation Females: 42 Years*				

Table-III. Time of Presentation from Index operation				
Months	**Males (n=7)**	**%age**	**Females (n=83)**	**%age**
0-18	01	14.28%	02	02.40%
19-36	01	14.28%	15	18.07%
37-54	02	28.57%	19	22.89%
55-72	02	28.57%	24	28.91%
73-90	01	14.28%	13	15.66%
91-108	-	-	05	6.024%
109-126	-	-	01	01.20%
127-144	-	-	03	03.61%
145-162	-	-	01	01.20%
Average Time Presentation Males: 45± 06 Months *Average Time Presentation Females: 65±06 Months*				

Duration of presentation was earlier among our male patients 4±01 years. Emergency laparotomy, which is the most common index operations according to literature[3], constituted only 7.77% (n =7) in our series of incisional hernias.

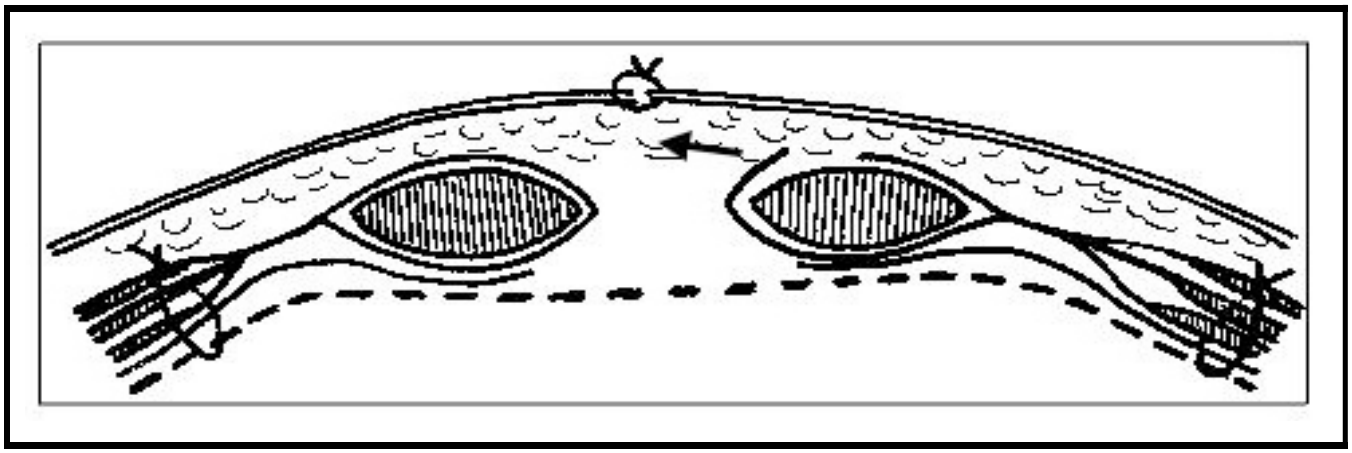
The most common incision resulting in an incisional hernia was the midline incision (77.77%, n=70), followed by the Pfannenstiel incision (13.33%, n=12).

Table-IV. Co Morbid Conditions		
Disease	**n=33**	**%age**
Hypertension	26	28.88%
Diabetes Mellitus	15	16.66%
Ischemic Heart Disease	02	02.22%
COAD	01	01.22%
Hepatitis C	07	07.77%
Note: Many patients had more than 1 Co Morbid Condition		

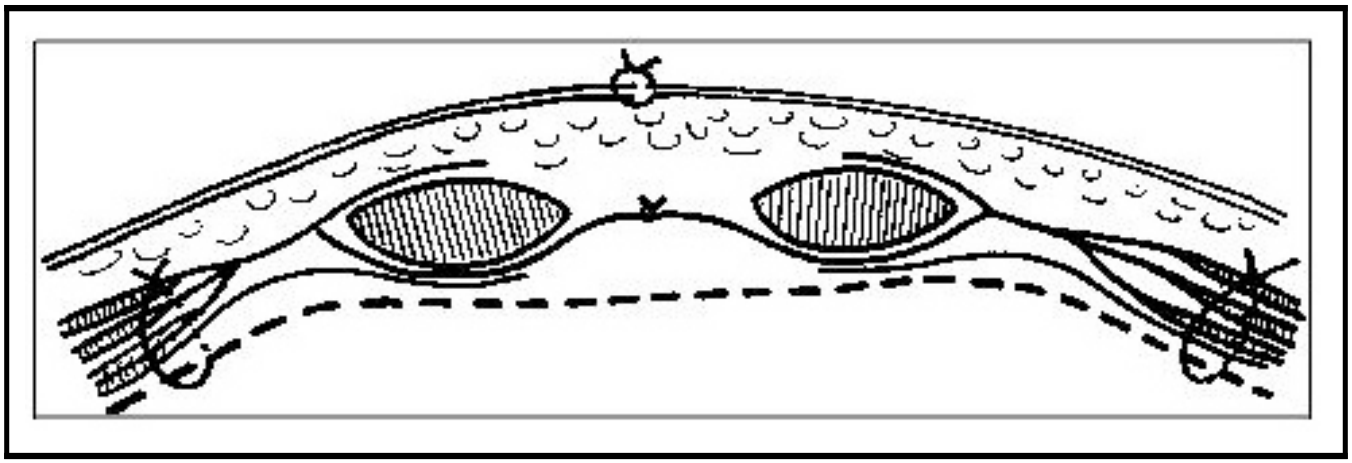
Surgical details

The most commonly used incision was the vertical elliptical incision excising the previous operative scar. The size of the mesh we have used ranged from 15×7.5 cm to 30×20 cm. Dermolipectomy was done in 45(50%) patients. Our technique involves the placement of a permanent prosthetic mesh (polypropylene) truly Intraperitoneal. After incising the subcutaneous tissue, the sac is dissected and delineated. The defect, most often in the midline, is opened along the linea Alba. Adhesiolysis is done, the defect is measured and the Mesh is the tailored to overlap 5cm on all sides of the hernial ring. Omentum is interposed between the mesh and the viscera .The mesh is secured all around with continuous 1/0 polypropylene sutures, using a new thread for each side; care is taken to keep the mesh flat and not allow it to be crimped. Facial closure is achieved by rectus sheath flap or locally made flap from the hernial sac. Dermolipectomy is done if indicated. Suction drain is placed in the subcutaneous tissues and the skin closed. In large hernias the sheaths are lax and weak. Due care is required not to excise any of the redundant tissue until

final closure of the tissues. This will ensure good availability of the layers to close without any tension at the end. All cases were given prophylactic antibiotics, injection Ceftriaxone 1gm twice daily I/V and tab Fucidic Acid 250 mg 8hrly for 05 days.



1. Locally Created Flap to Cover Mesh from Rectus Sheath



2. Optimal Closure with intraperitoneal Mesh Placement

Drains were used in all the patients. The period of drainage ranged from 2-7 days, the average period being 3-5 days. Prolonged drainage was encountered in only 8.88% (n=8) patients, and minor wound infections in 11.11% (n=10) patients ,No major wound sepsis was seen. The average duration of postoperative stay was 5±2 days, (minimum = 3 days, maximum = 14 days). Postoperative stay was extended in patients who underwent additional Dermolipectomy 8±3 Days(Table V, VI and VII).

Table-V. Operating Time: Surgeon factor Constant

Minutes	Cases	%age
45-60	05	18.88%
61-75	40	44.44%
76-90	33	36.66%
91-105	10	11.11%
106-120	02	02.22%

Time Factor Associated with/Without Dermolipectomy						
Dermolipectomy	**45-60 minutes**	**61-75 minutes**	**76-90 minutes**	**91-105 minutes**	**106-120 minutes**	**Total**
With	-	11	23	09	02	45
Without	11	23	10	01	-	45
Total	11	34	33	10	02	G.T = 90
Average Operating Time with Dermolipectomy: *80± 10 Minutes* *Average Operating Time without Dermolipectomy:* *60± 20 Minutes*						

Table-VI. Post operative complications		
Complications	**Cases**	**%age**
Prolonged drainage	08	08.88%
Minor wound infections	10	11.11%

Table-VII. Hospital Stay			
Days	**Patients**	**%age**	**Dermolipectomy**
03-05	21	23.33%	00/00.00%
06-08	45	50.00%	23/51.11%
09-11	15	16.66%	13/86.66%
12-14	09	10.00%	09/100%
Average hospital Stay without Dermolipectomy *5± 2 Days* *Average hospital Stay with Dermolipectomy* *8± 3 Days*			

Follow up

85.55% patients (n=77) attended our follow-up, ranging from 12 months to 05 years. Serial abdominal sonograms were done at 03, 06, 09 and 12 months postoperative. Method of follow-up in outpatients department (OPD)/Clinics: 71.11%(n=64), by telephonic conversation: 12.22%(n=11). 14.44%(n=13) were lost in follow up. No recurrences were noticed in the follow-up group.

DISCUSSION

A literature search was done to compare the results of our technique with other published repairs for incisional hernia. Pure Anatomical repairs had a high rate of surgical failure a humbling (10 – 40%)[2,3].

Nowadays, tension free mesh repair is ideal hernia repair technique[12]. Prosthetic mesh repairs had a lesser incidence of recurrence .The incidence of incisional hernia was highest among females in the 4th and 5th decades of life. Gynecological operations with a lower midline incision accounted for the majority of the index operations, which resulted in incisional hernia.

The intraperitoneal placement makes the procedure easy and minimizes dissection. The advantages of placing the mesh in this plane are:

1. This plane is open and allows easy placement of meshes of all size. No dissection is required for it placement, minimizing tissue trauma, bleeding and post op complications like pain and seroma formation.

2. Any infection occurring in the subcutaneous plane does not affect the mesh.

3. The prosthesis adheres to the peritoneum and renders it inextensible, permitting no further herniation.

4. The prosthesis in this plane cannot be dislodged or ruptured by intraabdominal pressure.

5. Tension-free repair.

Although this is not a new method of repair, it has however

fallen out of favor due to complications mentioned in the literature[6,13,14]. In Large incisional hernias tissue planes are difficult to dissect and demonstrate as the rectus sheath is at times very flimsy making the favored preperitoneal repair an extremely difficult and at times impossible task.

The mesh size used in our cases ranged from 15-30 cm, thus indicating most of the cases in this series were large midline hernias. During the dissection, it is important to retain the redundant sheath and sac of the hernia until the end. Trimming of these are done just before suturing. Excision in the early phase of the dissection can lead to shortage of tissues for closing and result in tension.

CONCLUSIONS

Intraperitoneal Meshplasty with conventional polypropylene mesh is a safe, quick, convenient method of incisional hernia repair with minimum morbidity and mortality; the results are comparable to any other procedure being practiced today. The complications associated with intraperitoneal placement of the conventional polypropylene mesh were not seen in our experience.

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