

Meshplasty in Ventral & Incisional Hernia

(A Comparative Study between Onlay & Inlay Techniques)

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Abstract:

Introducion&Objectives: Ventral hernia of both types spontaneous & incisional are commonly encountered in surgical practice. Despite the frequency of surgical repair, perfect results continue to elude surgeons & the rate of surgical failure may approach 10-30%. Nowadays meshplasty is regarded as ideal procedure for hernia repair & actually primary suture repair is abandoned except for hernia with defect size of less than 2.5cm. Different types of mesh used for repair & different sites of placement described including onlay, inlay, sublay & sandwich pattern with different results.

Aim of this study is to evaluate meshplasty in ventral & incisional hernia & to compare between onlay & inlay techniques in regard of operative ease, time, early & late postoperative complications.

Design: Prospective comparative study.

Patients and Methods: This study was conducted on (60) patients with ventral & incisional hernia admitted to surgical department of Kirkuk general hospital between the periods Feb-2010 to Feb-2013. All patients were grouped randomly into two groups: Group (1) including (30) patients with onlay meshplasty & Group (2) including (30) patients with inlay technique.

Results: The age of the patients was ranged (22-75) years with mean age of (48.5) years. Most of the patients were at fourth decade (48.3%) (n=29).

(70%) of all patients (n=42) were females & (30%) of them (n=18) were males.

(66.6%) of all patients (n=40) had incisional hernia & (33.3%) of patients with spontaneous hernia (n=20).

The operative time in patients of Group (1) onlay technique was (60-100) minutes compared to (50-80) minutes in patients of Group (2) inlay technique. (3) Patients (10%) of Onlay Group developed seroma, (2) patients (6.6%) had deep wound infection. None of all patients of either group had sinus or enterocutaneous fistula. (4) patients (13.3%) of Onlay Group had recurrence of their hernia during (12) months period follow up but only one patient (3.3%) of Inlay Group developed recurrence during same period of follow up.

Conclusion: Inlay meshplasty for repair of ventral abdominal hernia is more effective & gives better results in regard of operative ease, time, early & postoperative complications.

Keywords:- Ventral hernia, onlay & inlay meshplasty, recurrence.

Introduction:

Ventral hernia is defined as an out pouching of peritoneal sac through a defect or defects in abdominal wall causing transient or permanent bulging & incisional hernia is occurring

through operative scar whether laparotomy scar or scar of previous hernia repair surgery^(1, 2, 3). Incisional hernia is considered to be truly iatrogenic. High recurrence rate of about (30-50%) after primary suture repair

&(1.5-10%) following prosthetic mesh repair is reported in some series. Nowadays meshplasty is considered to be ideal procedure of repair of hernia& makes a revolution in hernia surgery in concept of tension free repair ⁽⁴⁾. The ideal site of mesh placement is still debated. In onlay technique mesh is placed in a pocket under the rectus muscle& also a sandwich pattern of mesh placement is described ⁽¹⁾. The different sites described give different results in regard of operative ease, time, early postoperative complications in form of seroma, haematoma, wound infection & flap necrosis & late postoperative complications in form of mesh shrinkage, sinus, enterocutaneous fistula & recurrence of hernia ⁽⁵⁾. Inlay on external oblique aponeurosis, inlay it is placed intraperitoneally& in sublay.

Patients and Methods:

This prospective study was conducted at department of surgery of Kirkuk general hospital during period between Feb 2010-Feb 2013 on (60) patients with uncomplicated ventral hernia including incisional hernia. All patients were randomly put into two groups, Group (1) including (30) patients with onlay technique& Group (2) (30) patients with inlay technique. Cases of ventral hernia admitted during period of the study as an emergency setting & those with defects less than (2.5) cm & more than (15) cm& those discovered at time of surgery to have dense adhesions between loops of the bowel & hernial sac were excluded from this study. All clinical data including detailed history & clinical examination& necessary laboratory investigations were put in a preforma including also important risk factors if present such as

smoking, obesity, diabetes, history of chronic cough or bronchitis, chronic constipation& prostatic enlargement.

Methodology:

All patients were received Cefotaxime 1g at time of induction & 1g (12) hourly for (5-7) days postoperatively. All patients were operated on under general anesthesia, elliptical incision around hernial bulge or scar of previous surgery deepened down to fascial aponeurosis, suitable flaps were raised& hernial sac was opened at neck & incision was deepened down to peritoneum & sac was excised. In Group (1) with onlay technique the fascial defect was repaired with prolene No/1 continuous sutures then suitable sized prolene mesh applied on the fascial repair so that (5) cm from the fascial edges & fixed with multiple prolene 2/0 stitches.

In Group (2) with inlay technique after removal of the hernial sac suitable sized prolene mesh applied intraperitoneally separated from viscera by spreading omentum in between & fixed with multiple through & through prolene 2/0 stitches to abdominal wall after that the fascial defect was approximated with prolene No/1 continuous suturing. Suction drainage using Redivac drain was applied to drain the subcutaneous space in all patients of both groups. Follow up was done for (12) months as outpatient visits or as telephone contact.

Results:

Age& sex distribution:-

The age of the patients was ranged (22-75) years with mean age of (48.5) years. Most of the patients were at fourth decade (48.3%) (n=29).

(70%) of all patients (n=42) were females & (30%) of them (n=18) were males. Most of female patients (73.8%)

(n=31) were housewives. Age& sex distribution is shown on table (1)
Symptomatology:-

All (60) patients in both groups were presented with abdominal swelling whether visible or palpable on examination. (60%) of patients (n=36) were presented with dragging pain & (10%) of them (n=6) presented with irreducibility of their hernia. This is summarized on table (2).

Regarding predisposing factors (21.6%) of patients (n=13) were smokers while (5%) of them (n=3) were obese with BMI of more than (30), (3.3%) of patients (n=2) had history of chronic bronchitis, (6.6%) of them (n=4) are known diabetics& none of our patients were steroid users, one patient had prostatic enlargement& (5) of them had chronic constipation. This is shown on table (3).

Operative time in Group (1)(onlay) was ranged(60-100)minutes while in Group (2) (inlay) it was ranged (50-80) minutes. Suction drain was removed in patients of Onlay Group after (48-72)

hours except in two cases after (5) days because of continous serous discharge while in Inlay Group it was removed after (24) hours

Postoperatively. In regard to early postoperative complications three patients (10%) of Onlay Group developed seroma, two patients (6.6%) had deep wound infection with abscess formation, in one of them necessitating removal of the mesh to control infection& no hematoma or flap necrosis were seen in all patients of both groups. In Inlay Group patients one patient (3.3%) developed cellulitis. None of all patients of group had sinus enterocutaneous fistula as a late postoperative complication while four patients (13.3%) of Onlay Group had recurrence of their hernia during (12) months period follow up but only one patient (3.3%) of Inlay Group developed recurrence during same period of follow up due to mesh shrinkage which was evident at revision repair surgery.

Table (1): Age& sex distribution.

Age/years	Male	Female	Total	Percentage
22-30	1	6	7	11.6%
31-40	5	10	15	25%
41-50	7	22	29	48.3%
51-72	5	4	9	15%
Total	18	42	60	100%

Table (2): Distribution of the patients according to the presenting symptoms.

Symptom	No. of patients	Percentage
Swelling	60	100%
Dragging pain	36	60%
Irreducibility	6	10%

Table (3): Distribution of the patients according to predisposing risk factors.

Predisposing factor	No. of patients	Percentage
Smoking	13	21.6%
Obesity	3	5%
Chronic bronchitis	2	3.3%
Diabetes	4	6.6%
Steroid use	0	0
Prostatic enlargement	1	1.6%
Chronic constipation	5	8.3%

Table (4): Distribution of the patients according to postoperative complications.

Complication	Group (1) Onlay (n/%)	Group (2) Inlay (n/%)
Seroma	3 (10%)	0
Hematoma	0	0
Wound infection		
*Superficial	0	1(3.3%)
*Deep	2(6.6%)	0
Flap necrosis	0	0
Mesh shrinkage	0	1(3.3%)
Mesh removal	1(3.3%)	1
Recurrence	4(13.3%)	1(3.3%)
Enterocutaneous fistula	0	0
Sinus	0	0

Discussion:

Ventral hernia including incisional hernia is common in surgical practice. Until 1990 simple suture repair was the gold standard in surgical treatment for such hernia with high recurrence rate of (25-63%) even for small facial defect of less than of 5 cm in some series ⁽⁶⁾. Nowadays primary suture repair is reserved for hernia with small defect less than (2.5) cm & meshplasty using different types of mesh is considered to be ideal surgical treatment for hernia & revolutionized hernia surgery ⁽⁴⁾ & decreasing recurrence rate to (1.5-10%) only ⁽¹⁾. The most commonly used mesh is polypropylene. The ideal site of placement is still debated. Onlay, inlay, sublay & sandwich pattern all are described with different results in regard of operative ease, time, early & late postoperative complications including recurrence ⁽⁵⁾. There is always a fear of bowel adhesions & fistulization with the use of polypropylene mesh when used intraperitoneally (inlay) whether in open or laparoscopic hernia repair but clinical evidence of thousands of surgery has suggested that omental adhesion is common but bowel adhesion is not & intraperitoneal placement of polypropylene mesh is quite safe ⁽⁷⁾. Factors associated with formation of incisional hernia & affect results of repair are those that impair wound healing such as wound infection, diabetes, steroid use, smoking, connective tissue disorder, malignancies, radiotherapy, multiple surgery, advanced age & conditions that increase intraabdominal pressure such as constipation, chronic obstructive airway disease & prostatic enlargement & surgical technique, type of incision & suture type ⁽¹⁾.

Obesity is a common risk factor; this depends on increased hazard of wound sepsis with a heavy panniculus. It is also because of increased intraabdominal pressure that accompanies a markedly thickened omentum & mesentery ⁽⁵⁾.

Operative time in Onlay Group was (60-100) minutes compared to (50-80) minutes in Inlay Group. The difference in time & ease of operation may be related to more dissection & tissue handling in Onlay Group to create sufficient space for laying down the mesh over the facial repair & more need of homeostasis which is another burden on time ⁽⁸⁾. In spite of drainage of subcutaneous space & removal of drains (48-72) hours & in (2) patients at 5th postoperative day, (3) patients (10%) in Onlay Group developed seroma & another (2) patients (6.6%) had deep wound infection with abscess formation necessitating drainage & in one of them removal of mesh, this may be related to extensive dissection & blood loss in these patients. In Inlay Group drains removed (24) hours postoperatively but no patient developed seroma. Incidence of superficial wound infection was (3.3%). Hematoma or flap necrosis was not seen in any of our patients of both groups.

In one series of (100) patients with inlay technique septic complication of the prosthesis (mesh) have been reported to occur in (0.2-0.8%), superficial wound infection was (6%) which comparable to the international figure of (3-8%) & incidence of seroma was (7%). Sinus or enterocutaneous fistula were not seen as late postoperative complication in any of our patients of both groups. A (2-5%) fistula has been reported with polypropylene mesh used intraabdominally however some studies don't support ⁽¹⁾.

Conclusion:

Inlay meshplasty is superior & more effective than onlay meshplasty for repair of ventral & incisional hernia in regard to operative ease, time, early & late postoperative complications.

References:

1. Muhammad Ayub Jat, Muhammad Rafique Memon, Ghulam Haider Rind, Syed Qarib Abbas Shah. Comparative evaluation of sublay versus inlay meshplasty in incisional & ventral hernia. Pak J S 2011;27(1);54-58.
2. Kollar R, Iholic J, Jaki J. Repair of incisional hernia with expanded polytetrafluoroethylene. Eur J Surg 1997;163:156-160.
3. Ahmed M, Niaz A, Hussain A, Saeeduddin A. Polypropylene Mesh Repair of incisional Hernia. JCPS 2003, Vol.13 (8); 440-442.
4. Fakher Hameed, Bashir Ahmed, Asrar Ahmed, Riaz Hussain Dab, Dilawaiz. Incisional Hernia Repair by preperitoneal (sublay) Mesh Implantation. Ann-Punjab Med. Coll. V:3 No.1 January-June 2009.
5. Lt Col S CHAWLA, Col GURJIT SINGH. Incisional Hernia through Non vertical Incisions. MJAFI 2000;56:316-319.
6. Dan H. Shell IV, MD, Jorge de la Torre, MD, Patricio Andrades, MD, Luis O. Vasconez, MD. Open Repair of Ventral Incisional Hernia. Surg Clin N Am 88 (2008) 61-83.
7. RK. Mishra. Laparoscopic Repair of Ventral Hernia. Textbook of Laparoscopic Surgery, 2nd Edition. 2009, P;228.
8. N. Junior Sundresh, Narendran, M. Ramanathan, Department of surgery, Rajah Muthiah Medical College & Hospital. Prospective study of incisional hernia & outcome of various surgical techniques. Journal of Scientific Research in Pharmacy 2012, 1(1), 15-19.