

## Comparative Study between use of Onlay Mesh and Composite Mesh in Repair of Complex Incisional Hernia

H.R.Meslam, A.A.Salem, M.E.Abdellatif and M.S.Abdelnaby  
General surgery Dept., Faculty of Medicine, Benha Univ., Benha, Egypt  
E-Mail: Abdelnaby@gmail.com

### Abstract

Patients with huge abdominal wall defects pose a great challenge to general surgeons. Failure of abdominal wall function cause many economic, medical and social problems such as chronic back pain, respiratory compromise, and altered body image. As patients are compelled to modify their way of life, their capacity to work become hindered which has negative monetary results; this reality drove the consideration of human services organizations to this issue. was to Compare between utilization of onlay work and Inlay composite work in fix of complex incisional hernia stressing repeat rate, post employable difficulties and come back to work... etc. This forthcoming examination was done on 40 sequential patients introduced to the benha university medical clinic, kobry elkoppa military Hospital for the board of complex incisional hernia. After endorsement of nearby morals board, all patients remembered for the investigation were educated about the system and a composed assent was acquired from each patient before conveying the procedur from May 2018 to May 2019 Follow up is intended for one year. In the examination we had no mortality. Among early postoperative complexities seroma happened in (15%), injury disease (10%), hematoma (5%) which were all treated minimalistically. Late postoperative inconvenience on follow up period no repeat among the cases was accounted for, no work evacuation and no fistula or intestinal attachments were accounted for just (15%) grumbled of outside body sensation. Intra-peritoneal composite work method is protected with low dismalness and confusions rate, okay of seroma and wound contamination. No revealed intestinal fistula or glue intestinal deterrent in examination with on lay work. Intra-peritoneal composite work application is a powerful technique in the executives of huge stomach divider absconds bigger than 10 cm because of any reason like enormous incisional hernia.

**Keywords:** Huge abdominal, General surgeons, Intra-peritoneal, Lifestyle and seroma.

### 1. Introduction

Complex stomach divider deserts speak to one of the all the more testing dilema looked by specialist. The regular history of stomach hernias has shown that with time. The patient personal satisfaction will be intensifying. Complex stomach divider deformity engender extra morbidity and can bring about considerable confusions if untreated

Hernias of the foremost stomach divider, or ventral hernias, speak to deserts in the parietal stomach divider sash and muscle through which intra stomach or pre-peritoneal substance can project.

Hernias might be inherent or obtained. Obtained hernias may create through moderate design disintegration of the solid aponeuroses or they may create from bombed recuperating of a foremost stomach divider entry point (incisional hernia).

Postoperative complex incisional hernia is a successive inconvenience following stomach medical procedure which might be a huge reason for bleakness.

There are various speculations on the etiology of complex incisional hernia, with the procedures of stomach conclusion and collagen digestion being the two generally significant. The last depends on the suspicion that the advancement of incisional hernia is activated by a lopsidedness of type I collagen to type III

The hazard factors for the improvement of complex incisional hernia were resolved. Preoperative hazard factors included: male sex, weight with a weight record (BMI) of over 30 kg/m<sup>2</sup>, nicotine use, diabetes mellitus, hypertension, kidney disappointment, cortisone use, lung malady, preoperative hemoglobin underneath 10 g/dl, preoperative egg whites beneath 3.5 g/dl, a known prior hernia, known malignant growth, collagen issue, crisis surgeries, known past medical procedure, just as a second

technique inside multi month, bulmonary infections included constant obstructive pneumonic sickness (COPD), interminable bronchitis, and bronchial asthma [1].

Complex incisional hernia Repair with Composite Mesh:

Hernias have a high pace of repeat, and specialists regularly utilize careful work to reinforce the hernia fix and decrease the pace of repeat. Careful work is a clinical gadget that is utilized to offer extra help to debilitated or harmed tissue. A composite work specifically is a work that has contrasting properties on the instinctive and parietal sides. You need the work to help the hernia and divider without sticking to organs. There are two sorts of careful work, absorbable and non-absorbable. Non-absorbable work will stay in the body inconclusively and is viewed as a changeless embed. It is utilized to give lasting support to fixed hernia. Absorbable lattices will debase and lose quality after some time. It isn't proposed to give long haul support to the fix site.

### Complex incisional hernia Repair with on lay Mesh

Fix of huge and mammoth incisional hernia utilizing prosthetic non-absorbable on lay work has a sensibly decent result with adequate paces of repeat. onlay work fix has demonstrated promising outcomes in our investigation. Careful Site Infection is the most widely recognized intricacy following fix of enormous and monster incisional hernia. Diabetes Mellitus and tainted medical procedure have reliably been demonstrated to be the two most significant hazard factors for SSI. Further forthcoming examination is required to explain the perfect strategy for fix for enormous and mammoth incisional hernias. The onlay fix was done under general sedation with skin entry point over the lump or the imperfection.

Utilizing obtuse analyzation, both the rectus sheath and the imperfection containing the hernia substance were recognized. The hernia sac was plainly analyzed and the edges of the imperfection were held by Kocher forceps. The sac was managed and its substance were diminished into the stomach cavity. With non-absorbable stitch, the imperfection in the linea alba was shut and a proline work of satisfactory size was set on the rectus sheath and fixed with fastens. Hemostasis was made sure about and wound was shut over a pull channel. A portion of wide range anti-toxin was offered preceding sedation [2].

**2.Subjects and methods**

This forthcoming examination was completed on 40 back to back patients introduced to the benha university medical clinic, kobry elkoppa military Hospital for the executives of complex incisional hernia. After endorsement of neighborhood morals board of trustees, all patients remembered for the examination were educated about the technique and a composed assent was acquired from each patient before conveying the procedur from May 2018 to May 2019 Follow up is intended for one year

Consideration rules: Sex: guys and females, Age: over 20 years and beneath 70 years and Patient with post-employable incisional hernia clinically manifested.

Prohibition rules: Patients denying medical procedure, Patients unfit for medical procedure, Patient over 70 years or beneath 20 years of age, Patients with no further administration of past activity eg. Persistent holding up modification of colostomy, Patient with major comorbid malady eg. Diabetes mellitus, Tuberculosis ,Hepatitis, Patients who won't proceed in this examination and Patients who evade during the subsequent period.

**All patients in the current investigation were oppressed tentatively to the accompanying:**

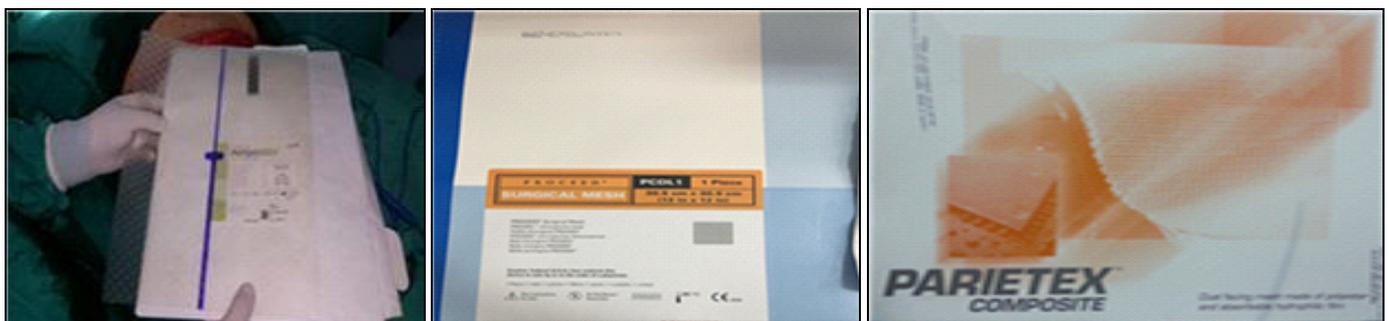
Preoperative evaluation: History and clinical assessment: Complete history taking, smoking and medication history. Exhaustive general and stomach assessment. Nearby assessment of the deformity including size of the imperfection, number of the imperfections, past stomach entry points.

Routine lab stir up: Complete blood check, Renal capacity tests, Coagulation profile, Liver capacity tests, Fasting and 2 hours post prandial blood glucose level and Blood gathering and Rh

Aspiratory work tests to assess the danger of postoperative respiratory shame after decrease of the substance.

Surgery: The system was done under general sedation with endo tracheal intubation. Skin sanitization beginning from areola line till thigh was done, trailed by hanging. Arranging of the entry point was represented by a few variables like the site and size of hernia, past careful scars. Skin was safeguarded as feasible for resulting skin inclusion. The EHS Classification was followed. The old scar and nearby fibrotic edges were remembered for the circular entry point overlying the hernia sac.

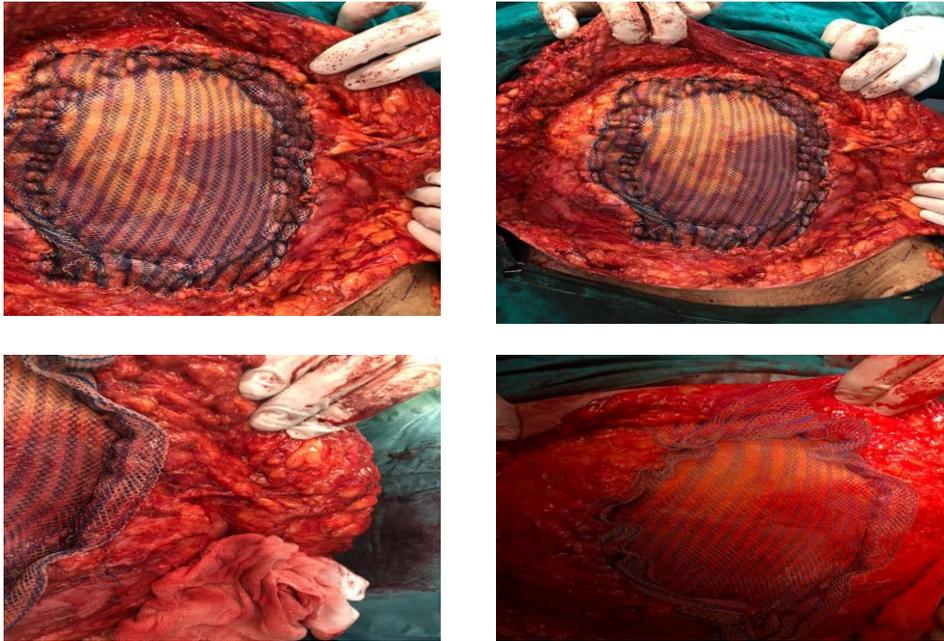
In cases that we utilized composite work: Three sorts of composite work were utilized that are accessible in the Egyptian market: Proceed TM (Ethicon Johnson and Johnson, Somerville, NJ, USA) and Parietex TM Composite (Covidien, New Haven, CT, USA) and Physiomesh TM (Ethicon Endo-Surgery, Johnson&Johnson, Inc., Cincinnati, OH, USA).During the investigation Ethicon had willful reviewed Physiomesh from Egyptian market



**Fig( 1)** Three types of composite mesh.

The size of the mesh should overlap the defect edges by at least 5 cm, usually a 30 x 30 cm size for Proceed and 30 x 35 for Physiomesh was needed and 30x20 for Parietex. In case of huge defects two meshes were used

and in this situation the tow meshes were sutured to each other with polypropylene (Prolene). Non absorbable sutures like polypropylene (Prolene) 2/0 or were used for mesh fixation in all types.



**Fig (2)** Suturing composite meshes to close the defects.

In many cases, the peritoneal sac was large enough to be used as a partial second layer covering over the composite mesh and can be sutured to the peritoneum of the other side by vicryl sutures.

**In cases that we used on lay mesh**

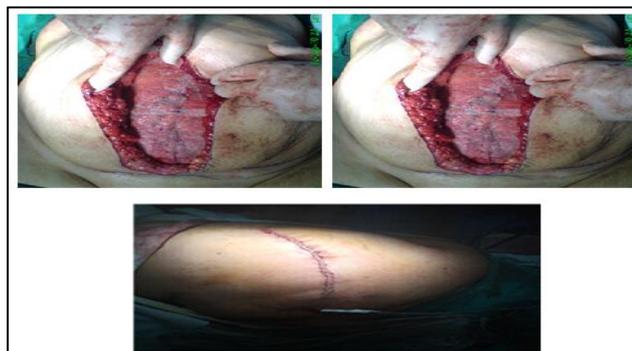
Exposure of the anterior rectus sheath 4 to 5 cm beyond the lateral margin of the defect. Closure of the hernia defect using running monofilament non absorbable

suture number 1 on round eyeless needle, applying junkles rules. Surgical mesh prepared to cover the hernia defect (onlay technique) at least 5 cm from the lateral edge. Fixation of the mesh using running monofilament nonabsorbable suture number 2/0 round eyeless needle, 5 to 8 mm from the mesh edge. Suction drain was placed in the subcutaneous space.

Skin closure using skin clips or interrupted non-absorbable monofilament sutures.



**Fig (3)** On lay mesh fixation



**Fig (4)** Post-operative picture skin is closed and redivac drain is placed

Finally, Hemostasis is assured and a closed suction drain (Redivac, 18 Fr) is placed in the subcutaneous tissue emerging through a separate stab incision away from the incision. The subcutaneous tissue is closed in layers followed by skin closure. Excess unhealthy skin is sacrificed.

**Post-operative care**

Post-operative all patients daily checked during the hospital stay for complications like seroma, infection and dehiscence. Stitches were removed when proper wound healing, usually after 2 weeks from surgery. Follow up visits were scheduled at 1,3, 6 and 12 months checking for recurrence which was done by clinical examination. CT was only done on indication.



**Fig (5)** Three days post-operative.

Statistical analysis: Recorded data were analyzed using the statistical package for social sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

**Table (6)** This table shows statistically significant higher total complications of the operation in onlay mesh group compared to composite mesh group. This table showed that there were 9 cases negative (45%) and 11 cases positive (55%) of composite mesh group, also were 2 cases negative (10%) and 18 cases positive (90%) of Onlay mesh group regarding total complications of the operation, (p-value= 0.013\* significant).

**3. Results**

**Table (1)** Comparison between composite mesh group and onlay mesh group according to recurrence rate.

Recurrence rate	Composite Mesh Group (n=20)	Onlay Mesh Group (n=20)	x2	p-value
Negative	17 (85.0%)	11 (55.0%)	4.286	0.038*
Positive	3 (15.0%)	9 (45.0%)		

x<sup>2</sup>: Chi-square test;\* p-value<0.05 S

**Table (1)** This table shows statistically significant higher positive recurrence rate in onlay mesh group compared to composite mesh group. This table showed that there were

17 cases negative (85%) and 3 cases positive (15%) of composite mesh group, also were 11 cases negative (55%) and 9 cases positive (45%) of Onlay mesh group regarding recurrence rate, (p-value= 0.038\* significant).

**Table (2)** Comparison between composite mesh group and onlay mesh group according to wound dehiscence.

Wound dehiscence	Composite Mesh Group (n=20)	Onlay Mesh Group (n=20)	x2	p-value
Negative	11 (55.0%)	8 (40.0%)	0.401	0.527
Positive	9 (45.0%)	12 (60.0%)		

x<sup>2</sup>: Chi-square test; p-value>0.05 NS;

**Table (2)** This table shows no statistically significant difference between groups according to wound dehiscence. This table showed that there were 11 cases negative (55%) and 9 cases positive (45%) of composite

mesh group, also were 8 cases negative (40%) and 12 cases positive (60%) of Onlay mesh group regarding wound dehiscence, (p-value= 0.527 non-significant).

**Table (3)** Comparison between composite mesh group and onlay mesh group according to VtE.

VtE	Composite Mesh Group (n=20)	Onlay Mesh Group (n=20)	x2	p-value
Negative	11 (55.0%)	10 (50.0%)	0.095	0.757
Positive	9 (45.0%)	10 (50.0%)		

x<sup>2</sup>: Chi-square test; p-value>0.05 NS;

**Table (3)** This table shows no statistically significant difference between groups according to VtE. This table showed that there were 11 cases negative (55%) and 9 cases positive (45%) of composite mesh group, also were

10 cases negative (50%) and 10 cases positive (50%) of Onlay mesh group regarding serroma, (p-value= 0.757 non-significant).

**Table (4)** Comparison between composite mesh group and onlay mesh group according to return to work.

Return to work	Composite Mesh Group (n=20)	Onlay Mesh Group (n=20)	t-test	p-value
Mean±SD	25.45±4.44	36.55±11.03	17.419	<0.001**
Range	18-a35	20-a60		

t-Independent Sample t-test; \*\*p-value <0.001 HS

**Table (5)** This table shows highly statistically significant increase mean of onlay Mesh group compared to composite mesh group according to return to work. The patients return to work in cases with composite mesh

ranged from 18 to 35 (mean return to work 25.45±4.44). While the return to work in cases with Onlay mesh ranged from 20 to 60 (mean return to work 36.55±11.03), (p-value= <0.001\*\* highly significant).

**Table (6)** Comparison between composite mesh group and onlay mesh group according to complications of the operation.

Complications of the operation	Composite Mesh Group (n=20)	Onlay Mesh Group (n=20)	x <sup>2</sup>	p-value
<b>Seroma</b>				
Negative	16 (80.0%)	11 (55.0%)	3.849	0.043*
Positive	4 (20.0%)	9 (45.0%)		
<b>Pain</b>				
Negative	12 (60.0%)	9 (45.0%)	0.902	0.342
Positive	8 (40.0%)	11 (55.0%)		
<b>Bleeding</b>				
Negative	18 (90.0%)	16 (80.0%)	0.784	0.376
Positive	2 (10.0%)	4 (20.0%)		
<b>SSI</b>				
Negative	18 (90.0%)	9 (45.0%)	9.231	0.002*
Positive	2 (10.0%)	11 (55.0%)		

x<sup>2</sup>: Chi-square test; p-value >0.05 NS; \*p-value <0.05 S

**Table (5)** This table shows highly statistically significant increase mean of onlay Mesh group compared to composite mesh group according to serroma and infection, while pain and bleeding insignificant. This table showed that there were 16 cases negative (80%) and 4 cases positive (20%) of composite mesh group, also were 11 cases negative (55%) and 9 cases positive (45%) of Onlay mesh group regarding serroma, (p-value= 0.043\* significant). As for the infection showed that there were 18 cases negative (90%) and 2 cases positive (10%) of composite mesh group, also were 9 cases negative (45%) and 11 cases positive (55%) of Onlay mesh group regarding infection, (p-value= 0.002\* significant).

#### 4. Discussion

Patients with complex incisional hernia represent an incredible test to general specialists. Disappointment of stomach divider work cause numerous financial, clinical and social issues, for example, ceaseless back torment, respiratory trade off, and adjusted self-perception.

The board of such cases can't be acted in low volume habitats and multidisciplinary group is pushed for

legitimate appraisal, conversation of potential choices, assessment and arranging of a surgery with the accessibility of clinical staff acquainted with such cases.

In this investigation the mean employable time was 94.0 ± 11.88. (3) detailed a comparative employable time with mean± SD. 97.0 ± 12.88. The mean usable time was less in the investigation of (4) (80.7 ± 15.76). The mean usable time was higher in the investigation of (5) of 130 min a long employable time was spent during analyzation, de-vascularisation, arrival of bonds and a few cases resection and anastomosis and conclusion of ileostomy.

In the present investigation, 3casse (15%) gave seroma and they were effectively overseen moderately. In the investigation of (3) 21 patients (17%) created wound seroma. The frequency of seroma was higher in the investigation of( Kassem et al.2016) (30%) experienced seroma. 2 patients (6.9%) created seroma. In the investigation of( 4) and Bernard et al.76) 3 cases (1.4%) and one case (1.6%) separately created seroma as they recorded just the clinically clear seroma and this clarify low rate of seroma in the two examinations.

Tow diabetic patients (10%) gave post-usable careful site wound disease and were made do with fitting anti-toxins subsequent to getting society and affectability and rehashed day by day dressing. This was like the most past examinations [5]. recorded that 6 cases (10%) created careful site wound contamination and were overseen by legitimate anti-infection agents [3]. oversaw 9 patients (7.2%) experienced injury disease. (Beltran et al.2014) distributed that 6 patient (7%) created careful site disease. 2 patients (6.9) created post-usable injury contamination and were overseen traditionalist [6]. two cases (6.6%) created shallow injury disease. It is noticed that the occurrence of wound disease is moderately low and all cases were overseen minimalistically in the writing.

In the present investigation just one case (5%) created hematoma. (5) distributed that three (5%) patients experienced hematoma.carried out an investigation of 88 patients and detailed 4 patients (4.5%) created hematoma. (3) detailed 2 patients (1.6) created post-employable hematoma.

In current investigation one patient was overseen for repetitive desmoids given post-usable draining that required blood transfusion yet was not re-worked [4]. one (.47%) quiet was re-worked for post-usable dying.

In this examination no case whined of incessant agony, just 3 patients (15%) grumbled from outside body sensation, this might be identified with wound compression, fibrosis and tactile nerve injury that may have been not surveyed in different investigations [5]. announced the occurrence of delayed agony over a half year in 2 patients (3.3%).

In the present investigation there was no repeat among the patients on development. In the investigation of (4) there were 9 patients (4.2%) experienced repeat. While patients worked in the investigation of (5) there were 3 cases (5%) detailed with repeat. In the investigation of (3) 10 patient (8%) recorded with repeat.

A bit of leeway of the intra-peritoneal strategy over onlay work position is the lower danger of work contamination as it is concurred that onlay situation increment this hazard especially with conceivably tainted injuries as during conclusion of stoma. We guessed that intra-peritoneal position limits this hazard.

Another inconvenience of onlay work situation is the need of broad dismemberment and this expansion the occurrence of seroma; then again the intra-peritoneal position requires less analyzation so decline the danger of seroma.

In examination with part detachment, our methodology can close significantly bigger size deformities in excess of 10 cm, while segment partition close imperfections up to 10cm as it is constrained by the accessibility of stomach divider muscles.

Intra-peritoneal composite work arrangement permits a strain free fix with negligible grip development. This sort of work joins a parietal side that advances tissue

ingrowths and an instinctive side that gives an obstruction limiting tissue connection. 80 [7].

Intra-peritoneal situation of the composite work has numerous favorable circumstances; usable time is not exactly different strategies. the position that permits an immediate fix of the hernia imperfection, the full thickness stitches through the stomach divider that guarantees a progressively secure obsession of the work, another preferred position of arrangement of the work along these lines is that the pressure is disseminated against the whole surface of the internal stomach divider, and this advances recuperating and lessens repeat and the nonattendance of broad dismemberment.

In view of this reality the speculation was that the intra-peritoneal work position is the best possible administration on account of simplicity application, shorter usable time and satisfactory post-usable result.

### 5. Conclusion

Intra-peritoneal composite mesh technique is safe with low morbidity and complications rate, low risk of seroma and wound infection. No reported intestinal fistula or adhesive intestinal obstruction in comparison with on lay mesh. Intra-peritoneal composite mesh application is an effective method in management of large abdominal wall defects larger than 10 cm due to any cause like large incisional hernia.

### References

- [1] M. K. Liang, J. L. Holihan , K. Itani, Ventrtral hernia management: expert consensus guided by systematic review. *Ann Surg.*; vol.23(5),pp.312,2014
- [2] R. Bittner , J. Bingener-Casey , U. Dietz,repair of giant incisional abdominal wall hernias using open intraperitoneal mesh. *Hernia*, Vol.11, PP.315–20, 2017
- [3] A. Pajtak , R. Stare , I. Biskup, modified open intraperitoneal mesh (Garestin) technique for incisional ventral hernia repair. *Asian J Surg*, Vol.40, PP.278-84, 2017.
- [4] A. Iuppa , L. Tenaglia , G. Iuppa, Incisional Hernia Repair with Intra-Peritoneal ePTFE Mesh: Technical Notes and Long-Term Results. In: *Crovella F, Bartone G, Fei L (eds). Incisional Hernia*, Vol.Germany, PP.Springer, PP. 157-68, 2008.
- [5] C1. Bernard, C. Polliand, L. Mutelica, Repair of giant incisional abdominal wall hernias using open intraperitoneal mesh. *Hernia*, Vol.11, PP.315–20, 2007,
- [6] M. I. Kassem , H. M. El-Hadda, Polypropylene-based composite mesh versus standard polypropylene mesh in the reconstruction of complicated large abdominal wall hernias: a prospective randomized study. *Hernia*, Vol.20, PP.691–700, 2016.
- [7] F. Basile , A. Biondi , M. Donat, Surgical approach to abdominal wall defects: history and new trends. *Int J Surg*, Vol.11, PP.S20–3, 2013.