Research Article

Onlay Mesh without Closure of the Defect in Management of Giant Ventral Hernia

Emad M. El-Sageer M.D, Tohamy A. Tohamy M.D and Ahmad M. Atiya M.D
Department of General Surgery, El-Minia Faculty of Medicine, El-Minia University

Abstract
Aim: Evaluation of effectiveness and safety of onlay mesh hernioplasty without closure of the defect in patients with giant ventral hernia. **Patients and methods:** This prospective study included consecutive patients with recurrent ventral incisional hernia that were admitted to The Department of General Surgery, Minia University Hospital in the period between March ٢٠١٥ and January ٢٠١٧. **Results:** ٢٠ patients, ١٢ males and ٨ females with recurrent giant ventral hernia were admitted in general surgery department Minia University Hospital in the period from March ٢٠١٥ to January ٢٠١٧**.** Hospital stay was ١٠ to ١٥ days with overall complication rate ٣٥٪. Wound seroma occurred in ٣٠٪, superficial wound infection occurred in ٥٪. No deaths. No recurrences. **Conclusion:** only mesh without closure of the defect in giant ventral hernia is an effective safe procedure in addition, it is an easy procedure with little dissection and can be done by junior surgeons.
Key words: Management, Giant, Ventral hernia

Introduction
Repairing an incisional ventral hernia is a major challenge for a surgeon. The high recurrence rates observed during hernia repair by tissue approximation led to development of tension-free procedures by using prosthetic materials.[١]

Giant ventral hernias are considered in cases where the hernia orifice is greater than ١٠ cm[٢]

Giant hernia with loss of abdominal domain occurs when the intra-abdominal contents can no longer lie within the abdominal cavity.[٣]

The components-separation technique, with the use of autologous tissue and its variations, has been described by Ramirez in ١٩٩٠[٤].

The main disadvantage of the components-separation technique, however, is the relatively high recurrence rate of ١٨–٣٠٪[٥-٧], the recurrence rate of the components-separation technique should be improved by a combination with mesh as shown by Ko et al., [٦,٨].

The use of polypropylene and host tissue barrier after suitable preoperative preparation is relatively simple, safe, and reliable surgical solution to the problem of giant ventral hernia.[٩]

Patients and methods
This prospective study included consecutive patients with recurrent ventral incisional hernia that were admitted to The Department of General Surgery, Minia University Hospital in the period between March ٢٠١٥ and January ٢٠١٧. Written informed consent was given from all included patients. Patients were subjected to complete clinical, laboratory, and radiological investigations. The abdominal wall defects were measured based on CT scan preoperatively. Preoperative medical optimization and prophylactic intravenous antibiotic and subcutaneous prophylactic anticoagulant for all patients were done. General endotracheal anesthesia was given. After skin incision and dissection of hernia defect from the edge of the defect, limited dissection of skin flaps from the appo-neurotic anterior abdominal wall, the peritoneum was closed and polypropylene

mesh applied with overlap ٥cm all around. If the peritonium cover was insufficient we used omentum barrier after isolating it between the mesh and intestine, and in some cases we did not find any of them so we used Proceed mesh (ETHICON) which is composed of three layers (oxidized regenerated cellulose (ORC), non-absorbable polypropylene mesh which is encapsulated by a polydiaxone polymer). Suction drain was inserted and wound closed after debridement of devitalized skin and to remove redundant skin. Postoperative prophylactic intravenous two doses of antibiotic after ٤ and ١٢ hours were given and patient allowed for oral feeding the day of the operation. Postoperative care of wound and drains left until less than ٥٠ cc discharge came this took from two to four weeks to be achieved. Postoperative complications were recorded and considered during ٣٠ days postoperatively. Hospital stay was from ١٠ to ١٥ days. Postoperative seroma was managed by leaving suction drain for one month while infection by intravenous combination antibiotics with superficial opening of the wound and wound care until healing with second intension while deep infection did not occurred. Abdominal binder applied for all patients for ٦ months. Follow up of patients was after ٣, ٦ and ١٢ months postoperatively for evidence of recurrence.

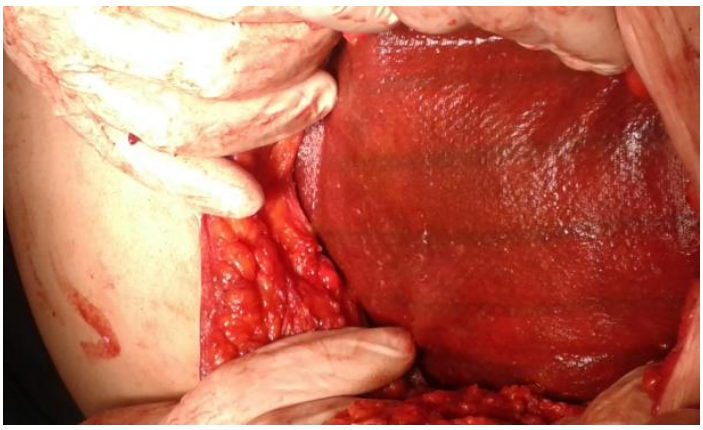

Fig (١) Proceed mesh

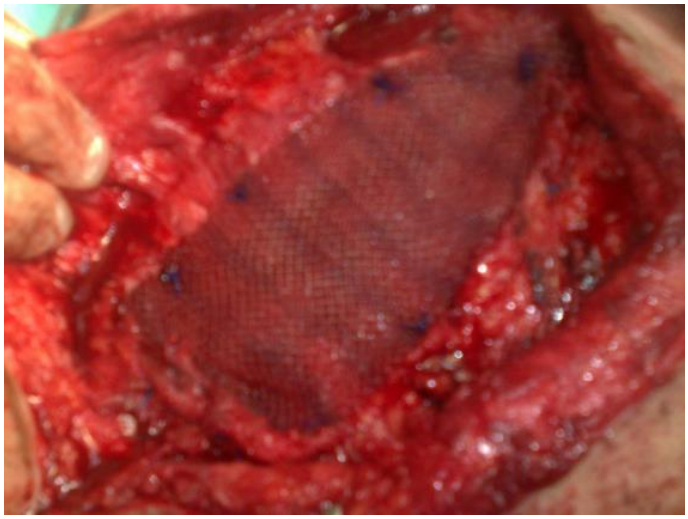

Fig (٢) Polypropylene mesh

Results

٢٠ patients, ١٢ males and ٨ females with recurrent giant ventral hernia were admitted, operated upon and followed up in general surgery department Minia University Hospital in the period from March ٢٠١٥ to January ٢٠١٧. Patients' age ranged from ٤٠ to ٦٨ years. Their BMI were ٢٨ to ٣٥ and three of them were diabetic.١٧ of them had midline incisional hernia, ٢ had transverse incisional hernias with multiple defects and one had post pfennestiel incisional hernia. Size of the defect ranged from ١٤ to ٢٥ cm. ٧ patients had recurrence twice, ٤ patients has three times recurrence, ٨ patients had recurrence for four times and one patient had recurrence for seven times. All of the midline hernias were post exploratory incisions ١٠ of them were after trauma, ٤ after peritonitis, ٢ after colectomy for colon cancer and one after intestinal resection for mesenteric vascular occlusion. The two patients with transverse incisional hernias were after multiple repairs for paraumbilical hernia and the one post pfennestiel incision was for hysterectomy for uterine malignancy. We used polypropylene mesh in ١٣ patients and Proceed mesh in ٧ patients. Hospital stay was ١٠ days in ٩ patients, ١٣ days in ٣ and ١٥ days in ٨ patients. Drain was removed after ١٥ days in١٤ patients, ٢٠ days in one patient and one month in ٥ patients. The ٦ patients who needed for stay of drain for ٢٠ to ٣٠ days were due to wound seroma. Superficial wound infection occurred in one patient. No deaths. No recurrences.

Table (١): Demographic data

Age	٤٠-٥٠ys	١٠	٥٠٪
	٥٠-٦٠ys	٥	٢٥٪
	Above ٦٠ys	٥	٢٥٪
Sex	Male	١٢	٦٠٪
	Female	٨	٤٠٪
BMI	٢٨-٣٠	٧	٣٥٪
	٣٠-٣٥	١٣	٦٥٪

Table (٢): Clinical data

Type of hernia	Midline	١٧	٨٥٪
	Transverse supraumbilical	٢	١٠%
	Pfennestiel	١	٥٪
Size of the defect	١٤-٢٠cm	١٠	٥٠٪
	٢٠cm	١٠ >	٥٠٪
Cause of incision	Trauma	١٠	٥٠٪
	Peritonitis	٤	٢٠٪
	Tumours	٣	١٥٪
	Paraumbilical hernia	٢	١٠٪
	Mesenteric vascular occlusion	١	٥٪
Number of recurrences	Twice	٧	٣٥٪
	Three times	٤	٢٠٪
	Four times	٨	٤٠٪
	Seven times	١	٥٪
Comorbidity	Diabetic	٣	١٥٪
	No	١٧	٨٥٪

Table (٣): Postoperative complications

Hospital stay	١٠ days ١٣ days ١٥ days	٩ ٣ ٨	٤٥٪ ١٥٪ ٤٠٪
Postoperative seroma		٦	٣٠٪
Postoperative infection		١	٥٪
Recurrence		٠	٠٪
Death		٠	٠٪

Discussion

Giant ventral hernias could be defined as ventral hernia larger than ١٠ cm with loss of domain.[١٠]

Giant ventral hernia may develop after an abdominal surgical procedure but may also arise spontaneously from, for example, an umbilical or epigastric hernia. Factors disposing towards the formation of hernia are postoperative infection, poor surgical technique, habitual factors such as smoking, and other disease such as diabetes, obesity and altered collagen metabolism[١١,١٢] .

Some authors worked on components separation technique combined with a double-mesh repair for large midline incisional hernia repair reported postoperative complications ٦٦٪ in a follow-up period of median = ١٣ months and showed no recurrence, while the occurrence of wound infections was ٤٤٪ and no mortality.[١٣]

Others worked on management of giant ventral hernia by polypropylene mesh and host tissue barrier and reported hospital discharge ٧ - ١٥ days, seroma responded to repeated aspiration in ١١.٤٪, wound infection in ١٤.٢٪ and hernia recurrence in ٢.٨٪ of patients.[٩]

The results of a double layer of mesh repair was done by Moreno-Egea et al., reported no recurrences, ٢٪ wound infections, ٤٪ wound dehiscence, and ١٠٪ seroma[١٤]
Studies reporting results of the component separation technique without mesh showed considerable wound complication rates[١٥] (as high as ٣٥٪) and morbidity rates (١٨–٢٤٪).[١٦]

In our study, Hospital stay was ١٠ to ١٥ days with overall complication rate ٣٥%. Wound seroma occurred in ٣٠٪, superficial wound infection occurred in ٥٪. No deaths. No recurrences. These results are satisfactory in comparison with others.

In conclusion, only mesh without closure of the defect in giant ventral hernia is an effective safe procedure in addition, it is an easy procedure with little dissection and can be done by junior surgeons.

References

١. Chrysos E, Athanasakis E, Saridaki Z, et al.,: Surgical repair of incisional ventral hernias: tension-free technique using prosthetic materials (expanded polytetrafluoroethylene Gore-Tex Dual Mesh). Am Surg. ٢٠٠٠ Jul; ٦٦(٧):٦٧٩-٨٢.

٢. Flament JB, Palet JP. Nyhus and Condon's Hernia ٥th edition. Philadelphia, USA: Lippincott W & W; Prosthetic repair of massive abdominal ventral hernias; ٢٠٠٢ pp. ٣٤١–٣٦٦.

٣. Javid PJ, Brooks DC. In: Maingot's abdominal operations (١١th edition) Zinner MJ, Ashley SW, editors. New York: MacGraw-Hill Medical; ٢٠٠٧. Hernias; pp. ١٠٣–١٠٩.

٤. Ramirez OM, Ruas E, Dellon AL. "Components separation" method for closure of abdominal-wall defects: an anatomic and clinical study. Plast Reconstr Surg. ١٩٩٠; ٨٦:٥١٩–٥٢٦.

٥. Vries Reilingh TS, Goor H, Rosman C, et al., "Components separation technique" for the repair of large abdominal wall hernias. J Am Coll

Surg. ٢٠٠٣; ١٩٦:٣٢–٣٧.Ko JH, Wang EC, Salvay DM, et al., Abdominal wall reconstruction: lessons learned from ٢٠٠ "components separation" procedures. Arch Surg. ٢٠٠٩;١٤٤:١٠٤٧–١٠٥٥.

٦. Sailes FC, Walls J, Guelig D, et al., Synthetic and biological mesh in component separation: a ١٠-year single institution review. Ann Plast Surg. ٢٠١٠; ٦٤:٦٩٦–٦٩٨.

٧. Ko JH, Salvay DM, Paul BC, et al., Soft polypropylene mesh, but not cadaveric dermis, significantly improves outcomes in midline hernia repairs using the components separation technique. Plast Reconstr Surg. ٢٠٠٩;١٢٤:٨٣٦–٨٤٧.

٨. Samir A. Ammar**:** Management of Giant Ventral Hernia by Polypropylene Mesh and Host Tissue Barrier: Trial of Simplification J Clin Med Res. ٢٠٠٩ Oct; ١(٤): ٢٢٦–٢٢٩.

٩. Guillaume Passot, Laurent Villeneuve, Charles Sabbagh, et al., : Definition of giant ventral hernias: Development of standardization through a practice survey. International Journal of Surgery, Volume ٢٨, April ٢٠١٦, Pages ١٣٦–١٤٠

١٠. Luijendijk RW, Lemmen MH, Hop WC, Wereldsma JC. Incisional hernia recurrence following "vest-over-pants" or vertical Mayo repair of primary hernias of the midline. World J Surg. ١٩٩٧; ٢١(١):٦٢–٥.

١١. Goodenough CJ, Ko TC, Kao LS, et al., Development and validation of a risk stratification score for ventral incisional hernia after abdominal surgery: hernia expectation rates in intra-abdominal surgery (the HERNIA Project). J Am Coll Surg. ٢٠١٥;٢٢٠ (٤):٤٠٥–١٣.

١٢. Bröker M, Verdaasdonk E, Karsten T. Components separation technique combined with a double-mesh repair for large midline incisional hernia repair. World J Surg. ٢٠١١ Nov.; ٣٥ (١١):٢٣٩٩-٤٠٢.

١٣. Moreno-Egea A, Mengual-Ballester M, Cases-Baldo MJ, et al., Repair of complex incisional hernias using double prosthetic repair: single-surgeon experience with ٥٠ cases. Surgery. ٢٠١٠; ١٤٨(١):١٤٠–١٤٤.

١٤. Shabatian H, Lee DJ, Abbas MA. Components separation: a solution to complex abdominal wall defects. Am Surg. ٢٠٠٨;٧٤:٩١٢–٩١٦.

١٥. Vries Reilingh TS, Bodegom ME, Goor H, et al., Autologous tissue repair of large abdominal wall defects. Br J Surg. ٢٠٠٧;٩٤:٧٩١–٨٠٣.