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**Dr. Golla Srinivas**

Post Graduate Student,

Department of General Surgery,  
Narayana Medical College, Nellore,  
Andhra Pradesh, India

**Dr. Gajula Madhusudana**

Post Graduate Student,

Department of General Surgery,  
Narayana Medical College, Nellore,  
Andhra Pradesh, India

## A comparative study of Onlay versus Sublay mesh repair in ventral hernias

**Dr. Golla Srinivas and Dr. Gajula Madhusudana**

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### Abstract

**Introduction:** Ventral hernias are the protrusion of intra-abdominal contents through the defect in the anterior abdominal wall. These defects may be congenital or acquired. Acquired hernias may be traumatic or iatrogenic.

**Materials and Methods:** This is a randomised double blind prospective study which was conducted in the surgical department of Narayana medical college and hospital. A total of 80 cases were included in this study. Of these, 40 cases were operated by the onlay mesh repair method and 40 by sublay mesh repair. In this study neither the patient nor the surgeon knows about the type of the procedure being executed on them. All the patients who approach in the OPD with the abdominal wall hernias are being asked to pick up the slip on which the procedure name was written.

**Results:** In our study out of the total 80 case operated for ventral hernias 40 were operated by Onlay repair and 40 cases by Sublay repair and both these groups were sub grouped on the basis of presence or absence of Seroma, patient satisfaction in terms of cosmetic as well as comfort and recurrence. When we compared the above said parameters between the two procedures.

Out of the 40 patients operated by the onlay technique 16 patients developed seroma out of these 16 patients who developed seroma 4 patients got infected and which was well controlled by antibiotic coverage based on culture and sensitivity report. Around 21 patients were not satisfied in terms of comfort due to wound collection, increased pain and infection. Around 22 patients were reported puckering of the scar, adherence of the skin to the mesh and feeling foreign body sensation under the skin.

Observations in the sublay mesh repair showed that only 1 patient developed seroma and 4 patients reported discomfort due to subcutaneous collection, 2 patients were reported cosmetic compromise due to tissue induration and there was no recurrences and infection.

**Conclusion:** In our study we concluded that sublay mesh repair is superior to onlay mesh repair in terms of seroma, cosmetic, comfort, recurrence and infection rates. Even though onlay mesh repair is most widely used and easy to do the procedure but associated with higher incidence of above said parameters.

**Keywords:** Ventral hernias, Onlay versus, traumatic or iatrogenic

### Introduction

Ventral hernias are the protrusion of intra-abdominal contents through the defect in the anterior abdominal wall. These defects may be congenital or acquired. Acquired hernias may be traumatic or iatrogenic.

By their location on the abdominal wall, they are named as Epigastric, Umbilical, Spigelian, incisional and lumbar hernias. Most of these hernias are commonly seen in low socio economic groups. Most of the patients are from the villages and they are unable to follow the post-operative instructions given to them while getting discharged from the hospital. The repair of ventral hernia has always been a challenge to the surgeon due to the high recurrence rates due to various patient related and technical factors. Various operative techniques have been described for the repair of these hernias. For example: Onlay mesh repair, Sublay mesh repair and laparoscopy repair. Each of these procedures have their own advantages and disadvantages. However, there is no ideal and standardised procedure for the management of these hernias have been described. Onlay mesh repair is most widely practiced method, most widely available and affordable but associated with higher incidence of seroma, Infection, less patient satisfaction and recurrence. Laparoscopic approach is associated with less incidence of above said drawbacks but it is not available everywhere and it is costlier. The sublay mesh repair is associated with benefits of the both above said procedures with less cost effective.

**Corresponding Author:**

**Dr. Golla Srinivas**

Post Graduate Student,

Department of General Surgery,  
Narayana Medical College, Nellore,  
Andhra Pradesh, India

**Aims and Objective**

The aim of this study is to compare the outcome of the onlay and Sublaymesh repairs in terms of seroma formation, Infection, patient satisfaction and Recurrence.

**Materials**

This is a randomised double blind prospective study which was conducted in the surgical department of Narayana medical college and hospital. A total of 80 cases were included in this study. Of these, 40 cases were operated by the onlay mesh repair method and 40 by sublay mesh repair. In this study neither the patient nor the surgeon knows about the type of the procedure being executed on them. All the patients who approach in the OPD with the abdominal wall hernias are being asked to pick up the slip on which the procedure name was written.

**Methods**

1. Onlay mesh repair after making skin and subcutaneous incisions, The sac is being dissected and excised or reduced and the defect was closed primarily and the rectus sheath was dissected off from the subcutaneous fat, then mesh was laid on the rectus sheath covering their defect in all the directions with minimum of 5 cm margin.
2. Sublay mesh repair here after skin and subcutaneous tissue incisions, the sac is being excised after reducing the contents and the defect is being repaired depending up on the orientation of its long axis, then followed by two Para median incisions on the anterior rectus sheath immediately adjacent to the linea alba was made and then the space between the posterior rectus sheath and rectus abdominus was created by retracting the rectus muscle laterally. Then the medial cut margins of the anterior rectus sheaths were sutured together forming new linea alba now the mesh is being fashioned in to H shape and being tucked in to the retro rectus space superiorly, inferiorly and laterally and fixed. Anterior rectus sheath is closed over the mesh. Since Sublaymesh placement requires retro rectus space hence the hernias lateral to the lateral border of the rectus sheath were not suitable for this technique.

**Inclusion criteria**

All the midline ventral hernia cases presented to the OPD irrespective of age, sex and weight, with or without comorbidities.

Ex: epigastric hernia, umbilical hernia, para umbilical hernia, Incisional hernia with single or multiple midline defects.

**Exclusion criteria**

- Obstructed, strangulated and incarcerated hernias
- All the hernias lateral to the lateral border of rectus sheath.
- Hernias with multiple defects not in the midline.

Method	Seroma	Comfort	Cosmetic	Infection	Recurrence
Onlay	16	19	18	4	4
Sublay	1	36	38	0	0
P-value	<0.0001	<0.0001	<0.0001	0.041	0.041

**Results**

In our study out of the total 80 case operated for ventral hernias 40 were operated by Onlay repair and 40 cases by Sublay repair and both these groups were sub-grouped on the basis of presence or absence of Seroma, patient satisfaction in terms of cosmetic as well as comfort and recurrence. When we compared the above said parameters between the two procedures.

Out of the 40 patients operated by the onlay technique 16 patients developed seroma out of these 16 patients who developed seroma 4 patients got infected and which was well controlled by antibiotic coverage based on culture and sensitivity report. Around 21 patients were not satisfied in terms of comfort due to wound collection, increased pain and infection. Around 22 patients were reported puckering of the scar, adherence of the skin to the mesh and feeling foreign body sensation under the skin.

Observations in the sublay mesh repair showed that only 1 patient developed seroma and 4 patients reported discomfort due to subcutaneous collection, 2 patients were reported cosmetic compromise due to tissue induration and there was no recurrences and infection.

**Discussion**

Our study shows that there is an increased risk of seroma and increased rates of discomfort and less cosmetic outcome associated with onlay mesh repair. In terms of patient comfort more number of the patients expressed their discomfort in the onlay mesh group due to seroma collection and also infection of the wound whereas in sublay group all most negligible seroma collection observed and the p value in terms of seroma for the both procedures is spastically significant. Similar findings have been observed by petro in their study<sup>3</sup>. These findings are due to extensive tissue dissection and tissue handling during hernia repair, placement of foreign body which is exposed to subcutaneous tissue <sup>[1, 2]</sup>.

In terms of comfort and cosmetic satisfaction more number of the patients in onlay group has reported they are not satisfied cosmetically and felt more discomfort due to swelling, induration and seroma collection in the wound and there is also increased risk of infection has been observed in onlay group and most of these patients complain's that skin has become tough and sticky due to adherence of the skin with the mesh and patient also complains feeling of foreign body sensation under the skin and also there was a scar puckering and disfigurement due to infection in onlay group. whereas in sublay group more number of the patients reported cosmetic satisfaction as well as comfortness after the procedure may be due to less seroma, less infection and less induration this is due to sublay position of the mesh which is not exposed to the subcutaneous tissue and the skin.

So in this study we found that sublay mesh repair is superior than the most widely used onlay mesh repair in terms of seroma, comfort, cosmetic, infection and recurrence rates and it is also less costly when compared to laparoscopic approach but sublay mesh repair is technically more demanding than onlay mesh repair which is of not a big concern as the surgeon gains the experience in this technique.

**Conclusion**

In our study we concluded that sublay mesh repair is superior to onlay mesh repair in terms of seroma, cosmetic, comfort, recurrence and infection rates. Even though onlay mesh repair is most widely used and easy to do the procedure but associated with higher incidence of above said parameters. In few studies it was found that ideal position for mesh repair appears to be retro muscular, where the force of abdominal pressure holds the mesh against deep surfaces of muscles <sup>[4]</sup>.

Sublay mesh repair is technically more demanding and requires skill but it is not a big concern as the surgeon gains experience in this procedure and it is also cost effective when compared to laparoscopic repair. But sublay mesh repair is limited to the

midline defects and defects with in the rectus sheath and it is not an ideal procedure for the defects outside the lateral border of the rectus sheath.

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