

ORIGINAL RESEARCH

A comparative study between sublay vs onlay mesh repair in ventral hernias

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ABSTRACT

Introduction- Hernia is a protrusion of a viscus or a part of a viscus through an abnormal opening in wall of its containing cavity. Ventral hernia is an encapsulating term referring to anterior abdominal wall hernias that include the following: epigastric, umbilical, spigelian, parastomal and most incisional hernias. There has been constant debate on which surgical techniques is superior for the repair of ventral hernia. Aim of this study is to compares onlay and sublay mesh repair. **Material and method-** This prospective comparative study was conducted on 60 patient from 2021 to 2022 in Department of General Surgery, Govt. Medical College & Rajindra hospital, Patiala, who underwent ventral mesh hernioplasty. **Results-** Current study shows that there is lesser incidence of post op pain, seroma formation, surgical site infection, wound dehiscence and foreign body sensation in sublay mesh repair at expense of operating time which is significantly higher with sublay mesh repair when compared with onlay mesh repair. **Conclusion-** Sublay mesh repair is superior to onlay mesh repair in all aspects, except for the fact that it requires longer operative time .

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INTRODUCTION

Ventral hernia repair is one of the most common surgeries done by general surgeons. Ventral hernias is an encapsulating term referring to anterior abdominal wall hernias that include the following: epigastric, umbilical, spigelian, parastomal, and most incisional hernias.^[1]

The treatment of choice for IHs should be mesh hernioplasty.^[1,2] The current standard approach to ventral hernia repair and the realm of abdominal wall reconstruction is that of repair of the fascial defect with reinforcement of the abdominal wall with mesh.^[3]

The ideal anatomic location for mesh placement during the repair of ventral hernias or abdominal wall reconstruction has been debated; however, the most common anatomic locations include: onlay, inlay and sublay placement of the mesh^[4]. This prospective study was conducted to compare 'sublay' versus 'onlay' meshplasty influencing the final outcomes in the ventral hernia repair with respect to duration of surgery, postoperative complications like

seromaformation, SSI, wound dehiscence, post-operative stay and recurrences, if any.

MATERIAL AND METHOD

This prospective comparative study was based on 60 patients, patients who had undergone ventral mesh hernioplasty, in the department of General Surgery, Rajindra hospital and Government Medical College, Patiala, India.

Random distribution of patients was done into two groups.

Group A: 30 patients who underwent sublay mesh hernioplasty.

Group B: 30 patients who underwent onlay mesh hernioplasty.

These patients were followed in postoperative period for pain, seroma formation, wound dehiscence, sinus formation, recurrence, hospital stay or any other postoperative complication.

All the patients in the current study were recruited after informed consent about the procedure. Refusal to participate in the study at any stage led to exclusion from the study. Study was conducted only after

getting clearance from the ethical committee of the institute. All the surgeries were done under general anaesthesia and all the patients could stand up independently at the earliest possible time. So, no difference was therebetween the two groups of patients in this respect.

AIM

To study comparison of outcome of sublay vs onlay mesh repair in ventral hernias.

INCLUSION CRITERIA

- Patient presenting with signs and symptom of ventral/ incisional hernia.
- Patient who are confirmed by USG.
- Patient who gives consent for participation in study.

EXCLUSION CRITERIA

- Patient presenting with signs and symptoms of strangulation.
- Operative findings which are not supportive of ventral hernias.
- Complications due to anaesthesia and other pre-existing renal, pulmonary and cardiac complications.
- Patients who are diabetic.
- Patients having ascites.
- Patients who are having tuberculosis.
- Patients having jaundice.
- Patient who refuses to give consent for participation in study.

OBSERVATIONS AND RESULTS

Mean age for group A was 49.37 ± 9.92 years and for group B was 48.83 ± 14.51 years. Both the groups were comparable in respect to their age distribution.

In current study out of 30 patients who underwent sublay repair 3 were epigastric, 16 were incisional, 11 were PUH/umbilical and 0 were spigelian, and among 30 who underwent onlay repair 2 were epigastric, 17 were incisional, 10 were PUH/umbilical and 1 was spigelian.

Mean duration for performing Sublay repair (group A) was 173.10 (SD 28.49) minutes and mean duration for performing onlay repair was 76.47 (SD 21.69). Operating time was more for Group A which was significant (p value <0.001).

Post operative pain was assessed by VAS and categorised as mild moderate severe. It was noted within first 24 hours 70% of patients in Group A (sublay) had mild pain while 26.7% had moderate pain, only 3.3% suffered from severe pain compare to Group B (onlay) 80% suffered from moderate pain, while 13.3% had mild and 6.7% had severe pain, showing that onlay group had more pain compared to sublay group, which was clinically significant (p value <0.001). Although chronic pain was not observed in both the groups.

Seroma formation occurred in 10% cases in sublay group and among 33% cases in onlay group during 1st week which was significant (p value 0.028) SSI occurred in 3.3% cases in sublay group and among 13.3% cases in onlay group which was insignificant (p value 0.353)

Wound dehiscence occurred in none of the cases of sublay group and among 13.3% cases in onlay group which was significant (p value 0.038) The mean duration of postoperative hospital stay (days) in group A and group B were 6.13 days (SD- 1.55) and 7.70 days (SD-3.08), respectively. The mean duration of postoperative hospital stay in group B is higher than that of group A which is found to be statistically significant (p 0.016)

Sinus formation was noted in one patient (3.3%) in onlay group while none of the patient in sublay group had such complication, which came out to be statistically significant (p 0.03)

Foreign body sensation was noted by 6.7% patients in sublay group and by 16.7% patients in onlay group which is statistically significant (0.042)

Recurrence was noted at 3month follow-up in one of the patients in onlay group while no recurrences were noted in sublay group, this data was statistically insignificant (p 0.998)

DISCUSSION

The best position for mesh placement to provide the fewest complications during and post operatively for ventral hernia repair has always been a source of discussion.

Better wound healing, a lower incidence of infection, and better mesh acceptance are benefits of the techniques that devascularize tissue as little as possible.

Sublay repair has the benefit of not spreading infection from subcutaneous tissues to the mesh, and it is more effective because intra-abdominal pressure acting anteriorly on the margins tends to push the mesh against the abdominal wall making it more efficient^[5]

In our study, the mean ages for groups A and B were comparable at $49.37 + 9.92$ years and $48.83 + 14.51$ years, respectively (p 0.366). In study by, Dinesh Kumar Sharma^[6] et al. average patient's age was 43.32 years in onlay mesh repair and 46.52 years in sublay mesh repair, which are comparable to our study

In our study, the average length of surgery was 76.47 21.69 minutes for cases undergoing onlay mesh hernioplasty and 173.10 28.49 minutes for cases undergoing sublay mesh repair. This discrepancy can be the result of the longer time required for dissection and for formation of retrorectusspace. Sublay mesh repair took an average of 55.2 minutes, according to Himanshu et al.^[7], while onlay took an average of 44.4 minutes (P 0.0001). According to a study by Aly Saber^[8] et al, the average operating time for onlay repair was 67.0413.19 minutes, whereas the average

operating time for the sublay group was 93.2624.94 minutes, with a range of 60 to 140 minutes and a P value of 0.0001. demonstrating that it takes significantly more time for sublay mesh repair.

Seroma was the most prevalent consequence seen in 13 patients. Seroma formation occurred in 10% of the patients undergoing sublay repair and among 33% of the patients undergoing onlay mesh repair group. In a study including 100 patients, Liaqat Ali Zia^[9] et al. revealed that seroma development occurred in 14% of onlay patients and 4% of sublay patients. According to Srinivas Rao Kancharla^[10] et al, 42.5% and 12.96% of the onlay and sublay groups, respectively, had seroma formation.

5 Patients had wound infections. 1 (3.3%) of these five cases belonged to a sublay group, and 4 (13.3%) to onlay group. Implying that, when compared to the sublay group, the onlay group had a higher risk of wound infection. Several studies also produced similar findings. In a study of 120 patients, Mohamed Hussien Alobaidi^[5] et al. discovered surgical site infections in 1 (1.33%) of the sublay group and 6 (10%) of the onlay. In a study of 100 patients, Liaqat Ali Zia^[9] et al. found that 4% of the sublay group and 16% of the onlay group had superficial wound infections, which is comparable to our results. These patients received standard care, including daily dressings and adequate antibiotics. One case of onlay repair had mesh excision due to infection.

Wound dehiscence was noted in 4 (13.3%) cases in onlay group, while none was noted in sublay group, which is comparable to study done by KR Reddy^[11] et al which showed 4% wound dehiscence in sublay group and 8% in onlay group.

The length of the patient's hospital stay following surgery is a measure of their morbidity in terms of postoperative problems. Onlay mesh repair required an average postoperative hospital stay of 6.13 1.55 days, compared to 7.70 3.08 days for sublay mesh repair (P 0.016), which is comparable to the results of a study by Srinivas Rao^[10] et al., who found that onlay mesh repair required an average hospital stay of 10.11 days and sublay mesh repair required 6.22 days. According to ChitrabalamTG^[12] et al, the average hospital stay after an onlay meshplasty was 9.390.29 days, which was substantially longer (p=0.0001) than the average hospital stay after a sublay meshplasty, which was 5.710.14 days. These findings support the current study, which also demonstrates that patients receiving onlay mesh hernioplasty stay in the hospital for a longer period.

Most patients who received sublay mesh repair reported experiencing mild discomfort, whereas patients who underwent onlay mesh repair reported experiencing significant pain. within first 24 hours 70% of patients in Group A (sublay) had mild pain while 26.7% had moderate pain, only 3.3% suffered from severe pain compare to Group B (onlay) 80% suffered from moderate pain, while 13.3% had mild and 6.7% had severe

pain, while there was no incidence of chronic pain in both the groups. As also shown by study from Tharun Ganapathy Chitrabalamet al.^[12] Similar results were depicted in study conducted by Himanshu Shekhar^[7] et al which showed post-operative pain was significantly (p=0.001) lower among patients of sublay group (2.58±0.70) compared to onlay group (3.86±1.10) with usual doses of analgesics.

Foreign body sensation is a subjective feeling of discomfort. 6.7% of patients in the sublay group and 16.7% of patients in the onlay group reported experiencing a foreign body. It is comparable to a study by Srinivas et al.^[10] who found significantly more patients in the sublay group indicated satisfaction with the procedure than the patients in the onlay group (P= 0.001). More patients in the onlay group than the sublay group (P=0.03) have indicated displeasure with the procedure over the long run due to the feeling of a foreign body.

In current study it was noted 1(3.3%) patient with onlay repair had sinus formation while none in sublay group had such complication. Which is comparable to study done by Dinesh et al, which showed incidence of sinus formation to be 8% with onlay mesh repair while no such complication was noted with sublay mesh repair.

Recurrence of the hernia is an upsetting complication for both the surgeon and the patient. In our study, the recurrence rates in both groups were statistically insignificant, with the sublay group experiencing no recurrences and the onlay group experiencing one (3.3%, p value 0.998). Similar findings were made by ChitrabalamTG^[12] et al. in their study, which indicated that recurrences between the two groups were insignificant (p=0.560), with 2 patients (0.027%) in the onlay group and 1 (0.013%) in the sublay group experiencing recurrence. Mohammed Hussien Alobaidi^[5] et al. conducted a study in which the onlay group experienced a recurrence rate of 6.66% while the sublay group did not. With a longer period of follow-up in the current study, statistical insignificance could become significant.

CONCLUSION

it can be concluded that sublay mesh hernioplasty is superior to onlay mesh hernioplasty in all aspects, aside from the fact that it takes longer to perform because it is more technically difficult and has a steeper learning curve.

REFERENCES

1. Bedewi MA, El-Sharkawy MS, Al Boukai AA, Al-Nakshabandi N. Prevalence of adult paraumbilical hernia. Assessment by high-resolution sonography: a hospital-based study. *Hernia*. 2012 Feb 1;16(1):59-62.
2. Smith J, Parmely JD. Ventral hernia. In StatPearls [Internet]. 2021 Aug 11. StatPearls Publishing Chitrabalam, Tharun Ganapathy et al. A comparative study between onlay and sublay meshplasty in ventral hernias: a randomized controlled trial. *International*

- Surgery Journal, [S.l.]. 2019 Mar;6(4):1264-1268. ISSN 2349-2902.
3. Mohamed RM, Rabie OM. Comparative study between onlay and sublay repair of ventral hernia. AlAzhar Assiut Med J. 2019;17:96- 102.
 4. Alobaidi MH, Alammam NR. Comparative Study between the—sublay| versus —onlay| techniques of mesh hernioplasty in Ventral hernias. Int J Adv Res Biol Sci. 2019;6(4):127-38.
 5. Sharma P, Bunkar SK, Kumar N, Yadav R, Sharma P. A comparative study of on-lay mesh repair and retro-rectus mesh placement in incisional hernia repair. European Journal of Molecular and Clinical Medicine. 2022 Jan 15;9(2):480-8.
 6. Shekhar H, Jindal R, Mukherjee S, Sharan J. Open onlay versus sublay mesh repair in ventral hernias—a comparative study. International Journal of Contemporary Medicine Surgery and Radiology. 2021;6(1):A74- Saber A, Emad KB. Onlay versus sublay mesh repair for ventral hernia. J Surg. 2015 Sep 8;4(1-1):1-4
 7. Zia LA, Farooq A, Amin I. Comparative Study between Sublay and Onlay Technique of Repairing Ventral Abdominal Hernia. PAKISTAN JOURNAL OF MEDICAL & HEALTH SCIENCES. 2016 Apr 1;10(2):670-2.
 8. Kancharla SR, Nimmagadda V, Bobba P. Desarda's repair versus Mesh hernioplasty for a strangulated inguinal hernia a randomized double-blind comparative study. Basrah Journal of Surgery. 2022 Dec 30;28(2):34-41.
 9. Reddy KR, Krishna BG, Takalkar AA. Onlay and sublay mesh repair in incisional hernias: our experience from GSL medical college and hospital, Rajahmundry. International Surgery Journal. 2021 Aug 27;8(9):2607-11.
 10. Chitrambalam TG, Anguraj P, Sundaraj J, Pethuraj M. Abcomparative study between onlay and sublay meshplasty in ventral hernias: a randomized controlled trial. International Surgery Journal. 2019 Mar 26;6(4):1264-8.