Is the recurrence rate of incisional hernia affected by mesh positioning?

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ABSTRACT

A best evidence topic has been constructed using a described protocol. The three-part question addressed was: In open mesh repair of incisional hernia, which technique has a lower recurrence rate, Sublay or Onlay? The best evidence showed that there is no statistically significant difference in the rate of recurrence among the two techniques.

1. Introduction

This BET was designed using a framework outlined by the International Journal of Surgery [1]. This format was used because a preliminary literature search suggested that the available evidence is of insufficient quality to perform a meaningful meta-analysis. A BET provides evidence-based answers to common clinical questions, using a systematic approach of reviewing the literature.

2. Clinical scenario

You are consenting a 40 year old morbidly obese male with recurrent incisional hernia, for open mesh repair. The previous surgery was suture repair; you are wondering which technique offers lower recurrence rate Onlay or Sublay?

3. Three-part question

[In open mesh repair of incisional hernia] [which techniques has lower recurrence rate] [Sublay or Onlay]?

4. Search strategy

A. Embase 1974 to October 2020 using the OVID interface:
[Incisional hernia] AND [mesh ] AND [repair OR repairs ] AND [onlay] AND [sublay] AND [surgical site infection OR SSI OR wound infection OR infection].

B. Medline using the PubMed interface:
[Incisional hernia] AND [mesh ] AND [repair OR repairs] AND [onlay] AND [sublay] AND [recurrence ].

The results were limited to English articles and human studies.

5. Search outcome

A total of 65 articles were identified after the removal of duplicates. Of these 50 were excluded on the basis of title and abstract. After full-text assessment of 15 articles another 8 articles were excluded because they did not include the information needed to compare the two techniques. A total of 7 articles (4 randomized controlled trials, one prospective and 2 retrospective studies) were identified to provide the best evidence to answer the question.
6. Result: see the table

| Author, date of publication, journal and country | Study type and level of evidence | Patient group Follow up | Outcomes | Key results | Additional comments |
|-------------------------------------------------|----------------------------------|-------------------------|----------|-------------|---------------------|
| Demetrashvili et al. 2017 International Journal of Surgery Georgia. | Randomized controlled trial level II | 180 patients Group 1: 90 onlay Group 2: 90 sublay Follow-up for the Sublay = (4.3 ± 1.2 years), Onlay = (4.6 ± 1.0 years) | Primary endpoint: recurrence rate Difference is not statistically significant | Group1 = 4(5.1%) Group2 = 2(2.6%) P = 0.68 | Single centre, large sample size, Short period of follow up |
| Sevinç et al. 2018 Turk J Surg Turkey | Randomized controlled trial level II | Total of 100 with incisional hernia Group 1: 50 sublay Group 2: 50 onlay median follow-up was 37.1 (26.6–46.5) months | Primary endpoint: recurrence rate Difference is not statistically significant | Group1 = 3(6%) Group2 = 1(2%) P = 0.307 | Single centre, Small sample size, Short period of follow up |
| Venclauskas et al. 2010 Hernia Lithuania | Randomized controlled trial level II | Total 107 patients underwent mesh repair Group1: 57/onlay Group2: 50 sublay median follow-up 12 months | Primary endpoint: recurrence rate Difference is not statistically significant | Group1: 6(10.5%) Group2: 1(2%) (P = 0.077). | Single centre, Small sample size, Short period of follow up |
| Manzoor et al. 2019 J Coll Physicians Surg Pak Pakistan | Multicenter, Randomized, Controlled Trial level III | Total 65 patients underwent mesh repair Group1: 33/onlay Group2: 32 sublay median follow-up Six months. | Primary endpoint: recurrence rate Difference is not statistically significant | Group1: 0(0.0%) Group2: 0(0.0%) (P = 1). | Single centre, Small sample size, Short period of follow up |
| Kumar et al. 2012 Indian J Surg India | Prospective study level III | Total 63 patients Randomized into: Group 1: 45 onlay Group 2: 18 sublay follow-up 5 years | Primary endpoint: recurrence rate Difference is not statistically significant | Group1 = 10.8% Group 2 = 9% (P = 0.077). | Single centre, Small sample size, No randomization, sample size is not equal between 2 groups |
| John J. Gleysteen, Arch Surg. 2009 UK | Retrospective study level III | A total of 125 patients Group 1: 75 onlay Group 2: 50 sublay Follow-up periods averaged 64 months | Primary endpoint: recurrence rate Difference is statistically significant | Group1 = 15(20.0%) Group2 = 2 (4.0%) (P = 0.02). | Single centre, Small sample size, Retrospective |
| Reilingh et al. Hernia (2004) Netherlands | Retrospective cohort study, level III | 80 patients underwent Mesh repair of incisional hernia Group 1: 13 onlay Group 2: 23 sublay | Primary endpoint: recurrence rate Difference is statistically significant | Group1 = 3(23%) Group 2 = 10(43%) (P = 0.08). | Single centre, Small sample size, Retrospective |

7. Discussion

Several clinical trials proved that the mesh repair of incisional hernia has lower recurrence rate compared with suture repair [2]. The risk factors for recurrence of incisional hernia have been classified into patient related (e.g., older age, obesity, diabetes, smoking, immunosuppression), hernia related (e.g., size and location) [3], and surgically related (e.g., experience, skills) [4]. It is still debatable whether the position of the mesh during the repair is associated with increased risk of recurrence. The aim from this review is to evaluate the rate of recurrence of incisional hernia among patients who underwent onlay versus sublay open mesh repair.

Reilingh et al., in 2005 [5] published retrospective study in order to assess the recurrence rate among onlay and sublay techniques, their conclusion was; sublay mesh repair has higher incidence of recurrence compared to onlay mesh. In contrast to this finding; Gleysteen in 2009 [6], conducted another retrospective study which showed that the incidence of recurrence is actually higher among patients who underwent onlay rather than sublay technique.

However, despite these contradicting results, we have also reviewed another 5 studies including 4 randomized controlled trials and one prospective trial that showed no statistically significant difference in the recurrence rate of incisional hernia between Only and Sublay mesh repair these studies were conducted by Demetrashvili et al., Sevinç et al. Venclauskas, Manzoor et al., Kumar et al. and [7–11].

8. Clinical bottom line

The best evidence showed no statistically significant difference in the recurrence rate between only and Sublay mesh repair of incisional hernia.

9. Limitation of this review

1. Small sample size in most articles
2. Shorter period of follow in most articles.
Author contribution

(RI): conducted the literature search and wrote the paper.
(TA): assisted in the literature search, editing of writing.
(SA): assisted in the literature search and Writing of paper.

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Guarantor

The Guarantor is the one or more people who accept full responsibility for the work and/or the conduct of the study, had access to the data, and controlled the decision to publish.

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