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S. Morales-Conde, M. López-Cano et al.

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REVIEW



## Ventral hernia repair in high-risk patients and contaminated fields using a single mesh: proportional meta-analysis

S. Morales-Conde<sup>1</sup> · P. Hernández-Granados<sup>2</sup> · L. Tallón-Aguilar<sup>3</sup> · M. Verdaguier-Tremolosa<sup>4</sup> · M. López-Cano<sup>4</sup>

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### Abstract

**Purpose** The use of mesh is a common practice in ventral hernia repair (VHR). Lack of consensus on which prosthetic material works better in different settings remains. This meta-analysis aims to summarize the available evidence on hernia recurrence and complications after repair with synthetic, biologic, or biosynthetic/bioabsorbable meshes in hernias grade 2–3 of the Ventral Hernia Working Group modified classification.

**Methods** A literature search was conducted in January 2021 using Web of Science (WoS), Scopus, and MEDLINE (via PubMed) databases. Randomized Controlled Trials (RCTs) and observational studies with adult patients undergoing VHR with either synthetic, biologic, or biosynthetic/bioabsorbable mesh were included. Outcomes were hernia recurrence, Surgical Site Occurrence (SSO), Surgical Site Infection (SSI), 30 days re-intervention, and infected mesh removal. Random-effects meta-analyses of pooled proportions were performed. Quality of the studies was assessed, and heterogeneity was explored through sensitivity analyses.

**Results** 25 articles were eligible for inclusion. Mean age ranged from 47 to 64 years and participants' follow-up ranged from 1 to 36 months. Biosynthetic/bioabsorbable mesh reported a 9% (95% CI 2–19%) rate of hernia recurrence, lower than synthetic and biologic meshes. Biosynthetic/bioabsorbable mesh repair also showed a lower incidence of SSI, with a 14% (95% CI 6–24%) rate, and there was no evidence of infected mesh removal. Rates of seroma were similar for the different materials.

**Conclusions** This meta-analysis did not show meaningful differences among materials. However, the best results (lower recurrence and complication rates after grade 2–3 VHR) were after using biosynthetic/bioabsorbable mesh.



## Publication

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## Systematic review and meta-analysis

To summarize the available evidence on **hernia recurrence** and complications after repair with synthetic, biologic, or biosynthetic/bioabsorbable meshes in hernias grade 2–3 of the modified Ventral Hernia Working Group classification.

## Protocol & Methods

### Study Population



**25 studies** (total of 3,771 patients) included:

- 2 RCTs
- 17 Retrospective Trials
- 6 Prospective Trials

### Study Design



**Inclusion criteria:**

- RCTs or Observational studies
- Patients  $\geq$  18 years
- Grade 2–3 VHR (under modified VHWG grading system)
- Usage of synthetic, biologic, or biosynthetic/slowly absorbable mesh



**Primary Outcomes:**

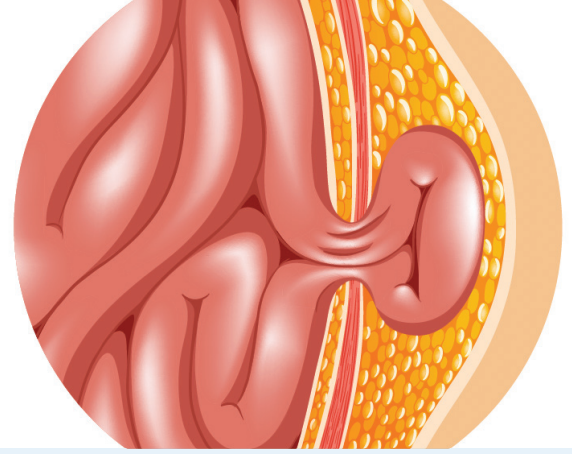
- Hernia recurrence
- SSO (including infection, wound dehiscence, seroma, enterocutaneous fistula)
- Surgical Site Infection (SSI), according to the CDC definition



**Secondary Outcome:**

- Re-intervention within 30 days
- Infected mesh removal

# Results



## Primary outcomes

### Hernia recurrence:

- Lower hernia recurrence rate for biosynthetic meshes
- Biosynthetic 9% (10 publications)
- Synthetic 13% (12 studies)
- Biologic 20% (14 studies)

### SSI:

- Lower SSI reported in biosynthetic publications
- (not statistically significant)
  - Biosynthetic – 14% (10 articles)
  - Synthetic – 18% (12 articles)
  - Biologic – 27% (13 articles)

### Seroma:

- similar seroma rates
- (20 publications)
  - Biosynthetic 8%
  - Biologic 9%
  - Synthetic 9%

## Secondary outcomes

### Infected mesh removal:

- Infected mesh removal: (9 publications)
- Biosynthetic - 0%
  - Biologic - 2%
  - Synthetic - 9%

### Surgical reintervention at 30 days:

- (12 publications)
- 8% for biosynthetic meshes
  - 6% for synthetics
  - 11% for biologic meshes



The long-term reintervention rates for synthetic mesh increase from 6 to 10% (95% CI 7–13% and remain unchanged for biosynthetic mesh.

## Conclusions

- This meta analysis shows a trend towards lower recurrence rate and complication rates in patients grade 2-3 (VHWG) when using biosynthetic meshes vs others.
- Biosynthetic meshes could be a promising alternative to synthetic and biological meshes in 2-3 grades.



BD Switzerland Sarl, Terre Bonne Park – A4, Route De Crassier, 17, 1262 Eysins, Vaud, Switzerland.

[bd.com](http://bd.com)

