Mesh Type Does Not Improve Short-Term Outcomes after Ventral Hernia Repair in Risk-Stratified Patients

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Background

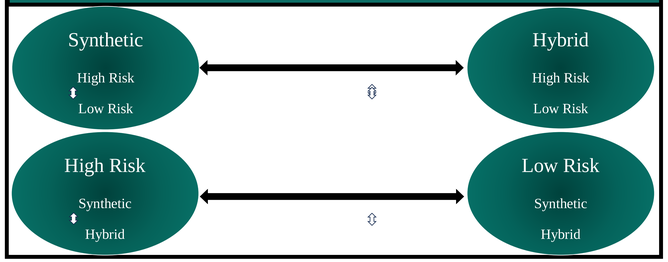
Synthetic	Absorbable	Hybrid
• Permanent strength • Cost-effective	• Tissue ingrowth • ↓ foreign body response • Resistant to infection	• Long-term durability • Possibly resistant to infection
• ↑ foreign body response	• $$$ • ↑ hernia recurrence	• $$

- Does monetary cost of more effective mesh (i.e. absorbable or hybrid over synthetic) outweigh benefit it may provide the patient given hernia complexity, social history, and individual risk for infection or complications?
- Controversy over appropriate mesh type given patient's overall health

Specific Aims

- Compare postoperative outcomes between low and high risk patients after ventral hernia repair (VHR)
- Compare postoperative outcomes between hybrid and synthetic mesh after VHR
- Investigate association with both variables (mesh type and risk level) and postoperative outcomes after VHR

Methods



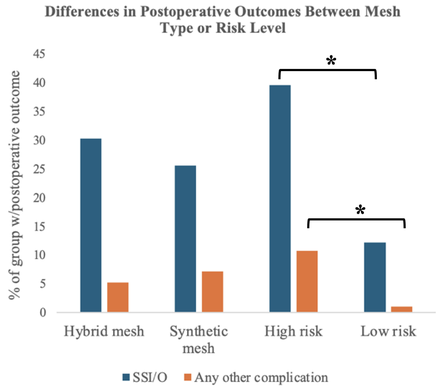
Methods

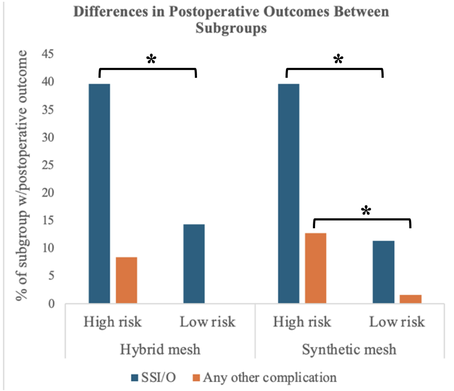
- Retrospective review; patients who underwent laparoscopic and robotic VHR with intraperitoneal onlay placement of hybrid (GORE® Synecor; n=76) and synthetic (n=125) meshes
- Data collected via chart review and entered into the ACS NSQIP Surgical Risk Calculator
- Postoperative outcomes (1-year recurrence, SSI, SSI/O, complication, and readmission) were also collected

Outcomes	Your Risk	Average Risk	Chance of Outcome	
Surgical Site Infection	0.5%	0.3%	Above Average	High Risk
Any Complication	1.3%	1.2%	Average	Low Risk
Readmission	0.6%	0.9%	Below Average	Low Risk

- Categorical variables compared using Chi-square or Fisher's exact test
- Subgroup comparisons conducted within each group (high-risk, low-risk, synthetic, and hybrid)
- Odds ratios and p-values were determined using multivariate logistic regression analysis
- Statistical analysis was performed in SPSS, and $p < .05$ indicated significance

Results





- In further hybrid mesh subgroup analysis, robotic hernia repairs had significantly fewer SSI/O than laparoscopic repairs
- When taking risk group and mesh type into account for all postoperative outcomes, the only predictor of SSI/O and any complication in logistic regression was ACS NSQIP calculated risk
- None of the comparisons between any groups or subgroups for SSI, readmission, or recurrence were statistically significant

* denotes statistical significance ($p < 0.05$)

Conclusions

- Mesh type was **not** associated with any short-term postoperative outcome, regardless of whether or not a patient's risk profile was considered
- NSQIP Surgical Risk Calculator accurately predicted post-operative complications in this population
  - SSI/O and any other complications were associated with high-risk patients
- Most common post-operative complication was a seroma (SSO)
  - likely due to the bridging nature of the majority of the repairs
  - Seromas rarely require treatment and do not affect long-term outcome; low morbidity
- Low SSI, recurrence and readmission rate in overall population

Future Work

- Track recurrence rates over longer time period
- Limitations: low risk of SSI and short-term hernia recurrence in minimally invasive hernia repairs → possible lack of power in our study

Acknowledgements

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References

1. Schneeberger S, Phillips S, Huang LC, Pierce RA, Etemad SA, Poulose BK. Cost-Utility Analysis of Biologic and Biosynthetic Mesh in Ventral Hernia Repair: When Are They Worth It? *J Am Coll Surg*. 2019;228(1):66-71. doi:10.1016/j.jamcollsurg.2018.10.009
2. Pérez-Köhler B, Bayon Y, Bellón JM. Mesh Infection and Hernia Repair: A Review. *Surg Infect*. 2016;17(2):124-137. doi:10.1089/sur.2015.078
3. Vorst AL, Kaoutzanis C, Carbonell AM, Franz MG. Evolution and advances in laparoscopic ventral and incisional hernia repair. *World J Gastrointest Surg*. 2015;7(11):293-305. doi:10.4240/wjgs.v7.i11.293
4. FitzGerald JF, Kumar AS. Biologic versus Synthetic Mesh Reinforcement: What are the Pros and Cons? *Clin Colon Rectal Surg*. 2014;27(4):140-148. doi:10.1055/s-0034-1394155
5. Kalaba S, Gerhard E, Winder JS, Pauli EM, Haluck RS, Yang J. Design Strategies and Applications of Biomaterials and Devices for Hernia Repair. *Bioact Mater*. 2016;1(1):2-17. doi:10.1016/j.bioactmat.2016.05.002
6. Cobb WS. A Current Review of Synthetic Meshes in Abdominal Wall Reconstruction. *Plast Reconstr Surg*. 2018;142(3 Suppl):64S-71S. doi:10.1097/PRS.0000000000004857
7. Rosen MJ, Krpata DM, Petro CC, et al. Biologic vs Synthetic Mesh for Single-stage Repair of Contaminated Ventral Hernias: A Randomized Clinical Trial. *JAMA Surg*. 2022;157(4):293-301. doi:10.1001/jamasurg.2021.6902
8. Nahabedian MY, Sosin M, Bhanot P. A Current Review of Biologic Meshes in Abdominal Wall Reconstruction. *Plast Reconstr Surg*. 2018;142(3 Suppl):74S-81S. doi:10.1097/PRS.0000000000004866