Staple Line Reinforcement
A costly luxury

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Staple Line Reinforcement (SLR): Sentinel Papers

SLR has been a topic of debate amongst bariatric surgeons for some time with several studies published showing varying results.

In support of SLR: Meta analysis


- Decreased bleed and leak rates in Bovine Pericardium (PeriStrips Dry)
- Dr. Shikora showed a significant decrease in both leaks and bleeds 1.28% and 1.23% respectively when bovine pericardium was used. This is a significant drop from the reported average of patients with no SLR 2.75% leak and 3.45% bleed rate.
Concerns of SLR reported bleed and leak rates in meta analysis

• How do we know where bleeding comes from?
  • Re-operation may show bleeding site, but often the bleeding site is not identified.
  • Bleed rates obtained from meta-analysis type studies most likely include bleeds that are not specifically identified from the staple line.

•Leaks have gone down with experience, not necessarily due to SLR being used.
  • In early 2000, laparoscopic bariatric surgery was still in its infancy. Using published studies from early experience skews the data.
Disadvantages of SLR: COST!

Types of products

- Gore (Seamguard – synthetic copolymer/polyglycolid acid: trimethylene carbonate) - $200 per firing
- Baxter (PeriStrips Dry – collagen matrix) - $200 per firing
- Cook Medical (Biodesign cross-link biologic graft) - $200 per firing
- Medtronic Reinforced Reload with Tri-staple – $400-700 per firing

- Actual cost per case is $1000-3500/case.
  - Five staple firings per case
  - That is a $100,000-350,000 of SLR for 100 cases for a potential reduction of 1-2%.
The Impact of Different Surgical Techniques on Outcomes in Laparoscopic Sleeve Gastrectomies

- 189,477 Sleeve Gastrectomies were included in the study from 2012 to 2014.
- 80% of cases used SLR and were associated with a higher leak rate and lower bleed rate.
  - Performing staple line reinforcement was associated with higher leak rates (0.96% vs 0.65%; odds ratio [OR], 1.20; 95% confidence interval [CI], 1.00 - 1.43) and lower bleed rates (0.75% vs 1.00%; OR, 0.74; 95% CI, 0.63 - 0.86) compared with not performing staple line reinforcement, when analyzed at the patient level.
  - When analyzed at the surgeon level, leak rates remained significant, whereas bleeding rates became nonsignificant.

Eviva Leak and Bleed Rates with no SLR from 2013-2016 N=1,296

Leak and Bleed Rates Post Sleeve Gastrectomy at Eviva

<table>
<thead>
<tr>
<th>Complication Rate</th>
<th>Dr. Billing n=407</th>
<th>Eviva n=1,296</th>
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</thead>
<tbody>
<tr>
<td>Bleeds</td>
<td>0.49%</td>
<td>1.70%</td>
</tr>
<tr>
<td>Leaks</td>
<td>0.25%</td>
<td>0.77%</td>
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</table>
Technique and Experience

In our practice the more experienced surgeons had significantly lower rates of bleeds and leaks.

The vast majority of leaks occur at the proximal end of the stomach. Oversewing the proximal 3 cm of the stomach has achieved desirable results at our practice.

Fibrin glue was used at the surgeons discretion.

Surgical technique and experience likely has a greater affect than the use of SLR in reducing leaks and bleeding post sleeve gastrectomy.
Conclusion

• The increased cost associated with SLR does not have a clear benefit
• Experienced surgeons will likely experience no difference when using SLR
• Surgeons without extensive experience may benefit from the use of SLR to decrease the risk of bleeds. Oversewing the proximal staple line should always be performed to decrease proximal staple line leaks.
• Laparoscopic sleeve gastrectomy without the use of SLR is safe to perform.
Thank You