Is Surgeon Technical Skill Associated with Long-Term Survival?

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BACKGROUND
- Technical skill, measured by video review, has been associated with postoperative morbidity and histopathologic outcomes.1,2
- It is unknown whether technical skill is associated with long-term survival.

OBJECTIVES
- Assess the association between surgical technical skill and overall survival following colectomy for colon cancer

METHODS
- Surgeons who perform colon resection were recruited from the Illinois Surgical Quality Improvement Collaborative in 2016. One video of a laparoscopic right hemicolectomy submitted by each surgeon was evaluated by ≥12 other surgeons.
- Technical skill scores were assigned using the American Society of Colon and Rectal Surgeons Video Assessment Tool, with possible score range from 1 to 5.
- Patients who underwent resection from 2012-2017 were included in the National Cancer Database.
- Overall survival was compared among skill terciles using the Kaplan-Meier method and multivariable Cox proportional hazard regression models. Association of raw technical skill score with survival was separately assessed.
- Technical skill and patient outcomes were assessed using the American Society of Colon and Rectal Surgeons Assessment Tool for Performance of Laparoscopic Colectomy.

RESULTS
- A total of 15 surgeons (mean skill score: 3.71; range: 2.99-4.60) and 916 patients were included.
- Patients were comparable across skill terciles when omitting patients who died within 90 days of surgery, suggesting that these findings are not solely attributable to mortality from surgical complications.
- Higher technical skill was associated with better overall survival, regardless of whether technical skill was measured by skill tercile or raw skill score (Figure 1).
- Survival differences persisted when omitting patients who died in the early postoperative period (Figure 2).

CONCLUSIONS
- This study demonstrates an association between surgical technical skill and long-term survival following cancer surgery.
- This association persists when excluding patients who died within 90 days of surgery, suggesting that these findings are not solely attributable to mortality from surgical complications.

LIMITATIONS
- This study included a relatively small sample of surgeons.
- Technical skill was assessed from a single surgical video at a single timepoint and may not be wholly representative of the surgeon’s skill throughout the duration of the study.

REFERENCES

FIGURE 1: OVERALL SURVIVAL AFTER SURGERY, BY SKILL TERCILE

<table>
<thead>
<tr>
<th>Skill Tercile</th>
<th>Hazard Ratio (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.00 (REF)</td>
<td>-</td>
</tr>
<tr>
<td>Middle</td>
<td>0.56 (0.34 - 0.93)</td>
<td>0.03</td>
</tr>
<tr>
<td>High</td>
<td>0.43 (0.27 - 0.70)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Raw skill score</td>
<td>0.43 (0.20 - 0.94)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

FIGURE 2: CONDITIONAL SURVIVAL AFTER SURGERY EXCLUDING 90-DAY MORTALITIES

<table>
<thead>
<tr>
<th>Skill Tercile</th>
<th>Hazard Ratio (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.00 (REF)</td>
<td>-</td>
</tr>
<tr>
<td>Middle</td>
<td>0.57 (0.33 - 0.95)</td>
<td>0.03</td>
</tr>
<tr>
<td>High</td>
<td>0.44 (0.27 - 0.72)</td>
<td>0.001</td>
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<tr>
<td>Raw skill score</td>
<td>0.44 (0.20 - 0.95)</td>
<td>0.04</td>
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