Are longer operative times total laparoscopic hysterectomy associated with decreased benefits compared to total abdominal hysterectomy?

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OBJECTIVES: To determine whether there is an operative time limit above which the benefits of total laparoscopic hysterectomy, TLH, for benign conditions are diminished when compared to shorter lengths for abdominal hysterectomy, TAH.

MATERIALS AND METHODS: Utilizing targeted hysterectomy data from the National Surgical Quality Improvement Project we identified patients who underwent either TLH or TAH between the years 2015-2018 using CPT codes. Women with a diagnosis of or undergoing procedures for malignancy, prolapse or incontinence, or non-gynecologic conditions, undergoing vaginal or supracervical hysterectomy by any approach were excluded. The primary outcomes of interest were any postoperative adverse event, and length of stay (LOS) were analyzed using generalized linear models; LOS was analyzed via logistic regression and risk of any complication with a negative binomial model. The models controlled for demographic data, co-morbidities, and hysterectomy-specific information such as uterine weight, presence of endometriosis and pelvic inflammatory disease at the time of surgery. Missing data were addressed using multiple imputation analysis. The interaction between operative time and route of surgery was included as a covariate in each model. Given the potential risk for selection bias, secondary models were constructed utilizing propensity score matching to adjust for likelihood of undergoing either route of surgery preoperative characteristics.

RESULTS: A total 82,132 TLH and 40,974 TAH met criteria for analysis. The mean operating time was similar for both routes, 129±60 minutes for TLH and 129±64 minutes for TAH, p=0.45. The complication rate was higher for TAH than TLH (16.6% vs 7.7%, p<0.001); and the median length of stay was longer for TAH (2, IQR: 2-3, days vs 1, IQR: 0-1, days, p<0.001). After adjusting for confounders, the variables most strongly associated with complications were a preoperative transfusion (aOR=2.37, 95%CI: 2.03-2.76), TAH (aOR=2.14, 95%CI: 1.92-2.39), greater than 10% weight loss within 6 months, and operating time (aOR=1.44 per hour of surgery, 95%CI: 1.41-1.49). Based on this analysis, there was no time point at which TAH would be more advantageous than TLH (Figure 1), and this held true for the propensity score adjusted cohort. For longer LOS, the strongest predictor was undergoing TAH (aOR=3.06, 95%CI: 2.99-3.14). Based on this model, as long as the operating time was shorter than 25.5 hours, LOS after TLH will always be shorter than after TAH after adjusting for all meaningful confounders, (Figure 2); this also held true in the propensity score matched cohort.

CONCLUSION: Based on this analysis, there is no reasonable duration of surgery at which TLH is associated with a higher rate of complications or longer length of stay compared to TAH.

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Comparison of laparoscopic hysterectomies for benign indication by surgical complexity to assess for differences in surgical outcomes

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OBJECTIVES: To compare surgical outcomes following laparoscopic hysterectomies of varying complexity tier.

MATERIALS AND METHODS: A retrospective review of hysterectomies from 01/01/2019 to 07/31/2021 that took place at Kaiser Permanente Riverside and Moreno Valley was performed. Inclusion criteria included laparoscopic hysterectomies performed for benign indications in women older than 18. Malignant or urogynecology cases were excluded. Complications, urgent care, and emergency visits, and readmissions within 90 days of the surgery date were assessed. Procedure length, estimated blood loss and conversion rates were also evaluated. Kaiser’s validated three-tiered complexity scoring system (Tier 1, Tier 2, Tier 3) was used to assess complexity.
Statistical analyses were completed using chi-square tests for categorical variables and analysis of variance (ANOVA) for continuous variables.

RESULTS: There were a total of 1,313 hysterectomies. Twenty four cases were removed due to exclusion criteria. 1,267 were total laparoscopic hysterectomies (TLH), among which 19% were tier 1, 32% were tier 2, and 28% were tier 3 complexity. When assessing readmission rates, emergency department visits, and urgent care visits, there were no statistically significant differences by complexity tier. Among TLH, there were a total of 70 (5.5%) complications among 59 patients. The primary complications observed were wound complications (17, 1.3%), transfusions (10, 0.79%), and perforated viscus (10, 0.79%). There was a conversion rate of 1.1%. There was no difference in complication rate by tier for TLH; however, looking at converted cases, there was an increased complication rate for Tier 3 cases (p<0.01). Tier 3 cases were associated with higher rates of admission and conversion to open, as well as longer procedure lengths and increased estimated blood loss.

CONCLUSION: While surgical complexity was associated with higher admission rates, procedure lengths, and estimated blood loss, there were no significant differences between readmission or complication rates. Higher complexity was associated with increased conversion rates. This study indicates that complex cases may safely be performed laparoscopically; however, patient selection and counseling are critical in the choice of operative approach.

<table>
<thead>
<tr>
<th>Complexity Tier</th>
<th>Outcomes</th>
<th>Overall (n=1267)</th>
<th>Tier 1 (n=239)</th>
<th>Tier 2 (n=674)</th>
<th>Tier 3 (n=354)</th>
<th>P-Value</th>
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</thead>
<tbody>
<tr>
<td>Readmissions (%)</td>
<td>41 (3.2%)</td>
<td>4 (1.6%)</td>
<td>24 (3.5%)</td>
<td>13 (3.6%)</td>
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<td>Emergency Department Visits (%)</td>
<td>186 (13.9%)</td>
<td>26 (10.9%)</td>
<td>96 (14.2%)</td>
<td>48 (13.9%)</td>
<td>0.41</td>
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<td>Urgent Care Visits (%)</td>
<td>193 (15.2%)</td>
<td>32 (13.6%)</td>
<td>150 (15.1%)</td>
<td>58 (16.1%)</td>
<td>0.41</td>
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<tr>
<td>Complications (%)</td>
<td>75 (5.9%)</td>
<td>8 (3.3%)</td>
<td>37 (5.4%)</td>
<td>28 (7.9%)</td>
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</tr>
<tr>
<td>Admission (%)</td>
<td>121 (9.5%)</td>
<td>21 (8.8%)</td>
<td>52 (7.7%)</td>
<td>48 (13.6%)</td>
<td>0.01</td>
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<td>Mean Procedure Length (min)</td>
<td>161</td>
<td>152</td>
<td>152</td>
<td>194</td>
<td>&lt;0.001</td>
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<tr>
<td>Mean Estimated Blood Loss (mL)</td>
<td>70</td>
<td>41</td>
<td>60</td>
<td>93</td>
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</tr>
<tr>
<td>Conversion to Open (%)</td>
<td>14 (1.1%)</td>
<td>1 (0.4%)</td>
<td>3 (0.4%)</td>
<td>10 (2.8%)</td>
<td>&lt;0.001</td>
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</table>

### DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS:
Sarah Simko: Nothing to disclose; Karin Jones: Nothing to disclose; Alireza Abidi: Nothing to disclose; Sung Park: Nothing to disclose.

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### Efficacy and safety of institution-wide restrictive blood transfusion protocol in gynecologic surgical patients

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OBJECTIVES: The use of restrictive blood transfusion protocols has been well documented in specific patient populations, however there is little data in the field of gynecology. The objective of this study was to compare differences in blood transfusion rates and surgical complications before and after the implementation of a restrictive transfusion protocol. The target population included patients undergoing major abdominal surgery by both gynecologists and gynecologic oncologists at a university hospital.

MATERIALS AND METHODS: On July 1, 2018, our institution implemented a restrictive blood transfusion protocol based on the American Association of Blood Banks guidelines, recommending against blood transfusion in hemodynamically stable patients when hemoglobin is above 7g/dL. This study was a quality improvement effort using a quasi-experimental design. Retrospective chart review was completed using an institutional surgical database in combination with the ACS National Surgery Quality Improvement Program to review patients undergoing major abdominal surgery by the gynecology and gynecologic oncology services 18 months prior to and post initiation of the transfusion protocol. Outcomes included number of patients, units transfused, and postoperative complication rates. Complications included operating room takebacks, infections, wound disruptions, pulmonary, renal, CNS, and cardiac complications, as well as DVTs, readmissions, and mortality.

Descriptive statistics were collected. Surgical data, including wound class, route of surgery, pathology, length of surgery, and emergent status were also collected. Transfusion and postoperative complication data were then analyzed. Categorical variables were analyzed using chi-squared and Fisher’s exact tests. Continuous variables were analyzed using student t-tests. A clustered analysis was also completed to further examine the significance of surgical complications.

RESULTS: A total of 739 patients were included. There were 290 people in the pre-protocol group and 449 patients in the post-protocol group. A similar number of patients received blood transfusions in both groups (9.3% vs. 10.6% p=0.57). However, significantly fewer units of blood were given post-protocol initiation (72 units vs. 52 units p=0.003). All postoperative complications were not significantly different between groups (p>0.05). When a clustered analysis was done of postoperative complications, the difference was still not significant (p>0.05).

CONCLUSION: We analyzed the efficacy and surgical complication rates of an institution-wide restrictive blood transfusion protocol in patients undergoing major abdominal gynecologic surgery for both benign and oncologic indications. The restrictive transfusion protocol was effective in decreasing the number of units of blood transfused without affecting postoperative complication rates in these patients.

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### Impact of pain catastrophizing in women undergoing pelvic floor surgery

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OBJECTIVES: To compare rates of voiding trial (VT) failure after urogynecologic surgery in women with versus (vs) without pain catastrophizing. Additionally, pelvic floor symptom bother and impact were compared between groups.

MATERIALS AND METHODS: Women undergoing urogynecologic surgery 03/2020 to 03/2021, who completed a preoperative pain catastrophizing scale (PCS, score range 0 to 52) were included in this retrospective cohort study. Pain catastrophizing was defined as PCS score ≥30 preoperatively. Women also completed the Pelvic Floor

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