PRE-OPERATIVE UTERINE ARTERY EMBOLIZATION REDUCES MORBIDITY OF HYSTERECTOMY FOR FIBROID UTERI: A RETROSPECTIVE STUDY

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• No relevant financial relationship reported
- Symptomatic uterine fibroids is the indication for nearly one third of all hysterectomies performed yearly in the United States\(^1\).

- Symptoms may include pelvic pressure, infertility, pregnancy loss, menorrhagia, pelvic pain, and abdominal distention. Additionally, patients may experience urinary frequency, dyspareunia, and/or anemia.

- Treatment options are guided by location and size. Surgical management is often preferred in patients with large uteri.

- Surgical resection of large fibroid uteri can be technically difficult, and may increase risk of operative complications. Large fibroids can significantly distort the pelvic anatomy, compromising the operative field. They tend to also have a vast blood supply, increasing risk for excessive blood loss.
Patients with large fibroid uteri are poor candidates for uterine artery embolization (UAE) alone. Mono therapy can lead to infection, sepsis, uterine necrosis, and death\(^2\).

Studies have shown that pre-operative UAE in the setting of laparoscopic myomectomy reduces blood loss and facilitates minimally invasive surgery in large uteri\(^3\),\(^4\).

Lack of data on benefits of pre-operative UAE in the setting of hysterectomy for large uteri.

Hypothesis: Immediate pre-operative UAE significantly reduces intra-operative and peri-operative blood loss in women undergoing hysterectomy for large fibroid uteri.
-**Experimental Group**: Pre-operative UAE and Hysterectomy 2006-2014 at Hartford Hospital, n=59. Pre-operative UAE selected for “large” fibroid uteri by design. Inclusion Criteria: “Hysterectomy” as the indication of fibroid uterus; identified by ICD-9 Code.

-**Control Group**: Literature standard of data compiled in 47 women undergoing traditional hysterectomy without UAE for fibroid uteri weighing >1000 g.

Average Uterine Weight: 1496 g (Experimental) vs. 1658 g (Control)

-**Parameters:**
  - Estimated Blood Loss (EBL)
  - Complication Rate (EBL≥500 mL, intra-operative or post-operative blood transfusion, pelvic organ injury, post-operative antibiotic use, hospital readmission, and any major systemic complication such as pneumonia, pulmonary embolism, or myocardial infarction.)
-Experimental Group:
Hysterectomies with pre-operative UAE were performed by greater than 25 different surgeons through an abdominal incision. Providers were primarily general gynecologists, with the exception of two cases where the surgery was performed by a gynecologic oncologist secondary to possibility of cancer, given rapidly enlarging fibroid uterus. UAEs were performed by 9 different interventional radiologists.

-Control Group:
Surgery was performed by obstetrics and gynecology housestaff under the direct supervision of attending faculty at Louisiana State University Health Sciences Center—Shreveport.
# RESULTS

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Variable</th>
<th>Pre-op UAE + Hysterectomy</th>
<th>Hysterectomy Only</th>
<th>p val</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n</td>
<td>59</td>
<td>47</td>
<td></td>
<td>-</td>
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<tr>
<td>2</td>
<td>EBL, mL (Mean ± SD)</td>
<td>360.6 ± 288.2</td>
<td>555.8 ± 386.5</td>
<td>.004</td>
<td>t</td>
</tr>
<tr>
<td>2</td>
<td>Complication Rate (n, %)</td>
<td>13/60, 21.7%</td>
<td>29/47, 61.7%</td>
<td>&lt;0.001</td>
<td>Fisher's exact</td>
</tr>
</tbody>
</table>
DISCUSSION

- Our results demonstrate a statistically significant reduction in blood loss and complication rates in patients that underwent UAE prior to Hysterectomy in comparison to patients that underwent Hysterectomy alone.

- Studies exist to compare uterine artery embolization versus surgical intervention as mono therapy for symptomatic uterine fibroid management; additionally, there is data comparing complication rates and symptomatic relief between these two interventions⁶.

- Scarce data to discuss the combined use of UAE and hysterectomy for management of very large fibroid uteri, which presents unique challenges with respect to overall morbidity and mortality.

- Based on our literature review, only one prior study by Ravina et al. has shown statistically significant reduction in intra- and peri-operative blood loss with UAE prior to hysterectomy⁷. This was a relatively small series (n=31) which was not specifically targeted for evaluation of large uteri (>500 mg).
LIMITATIONS

- Comparison of parameters at different institutions, which does not account for variations in surgical technique, skill/operative experience of individual surgeons/IRs, and institution specific intra-operative recording standards.

- Study design: Retrospective
CONCLUSION & FUTURE DIRECTIONS

- Pre-operative UAE prior to Hysterectomy for management of symptomatic large fibroid uteri can offer potentially significant reduction in morbidity and mortality including blood loss.

- Combined endovascular and surgical approach provides further support of the multifaceted utility of the UAE technique.

- Future studies in the form of a randomized, prospective cohort study may provide further support for this technique.
REFERENCES


