

Successful Removal of Giant Uterine Leiomyomata with Minimal Blood Loss: Case Report and Literature Review

Alexandra E. Snyder^{1*}, Christine Rojas², John C Elkas¹

¹Inova Fairfax Medical Campus, Department of Obstetrics and Gynecology, Falls Church VA, USA; ²Walter Reed National Military Medical Center Department of Gynecologic Oncology, USA

ABSTRACT

Giant uterine leiomyomata, defined as those greater than 11.4 kg, are a rare presentation of extremely common gynecologic tumors. Most case reports of surgical resection of these tumors describe significant blood loss requiring blood transfusion. The two largest tumors successfully resected as reported in the literature weighed 51 kg and 45.45 kg. We report a case of a successful surgical resection of a 45 kg myoma originating from the uterine cervix and lower uterine segment with minimal blood loss and no requirement of blood transfusion. The surgical technique of hypogastric and infundibulopelvic artery ligation prior to dissection of the tumor or uterus aided in preventing hemorrhage during this surgery.

Keywords: Giant; Fibroid; Surgery; Resection; Hemorrhage

INTRODUCTION

Teaching points: Resection of giant leiomyomata is often complicated by significant blood loss. Ligation of all major vessels including hypogastric arteries may help prevent the need for volume resuscitation and transfusion.

Uterine leiomyomata are among the most common benign tumors affecting women and can have great variation in size. Giant leiomyomata are uncommon and are defined as greater than 11.4 kg (25 lbs) [1]. From our literature search, the largest documented uterine leiomyoma removed was 45.45 kg [2]. A broad ligament spindle cell myoma weighing 51 kg, resected in two parts in 2006, is the largest benign gynecologic tumor documented to have ever been removed from a living patient. We present a case of a 45 kg leiomyoma, one of the largest uterine leiomyoma ever successfully removed from a living patient and the largest myoma ever removed, as reported in the literature, without requiring blood transfusion.

CASE

The patient is a 72-year-old female with a known heterogeneous pelvic mass who underwent exploratory laparotomy, radical total abdominal hysterectomy, bilateral hypogastric artery ligation, and infracolic omentectomy. The patient's past medical history

was significant for a prior cerebrovascular accident, heart murmur, hyperlipidemia and hypertension. She had no history of prior abdominal surgery. Her BMI upon arrival was 36.9, which decreased to 28 at the time of post-operative discharge. She presented with a mass measuring 44.9 × 38.5 × 26.9 cm mass filling the abdomen and pelvis on CT scan in 2018 and declined surgery at that time. She returned in 2020, when a repeat CT showed the mass to be 39.6 × 40.4 × 26.9, relatively unchanged in size from 2018. Given the large persistent mass and pelvic pressure, the patient was amenable to proceed with surgical resection. (Figures 1A-1E).

Correspondence to: Alexandra E Snyder, Inova Fairfax Medical Campus, Department of Obstetrics and Gynecology, 3300 Gallows Road, Falls Church VA 22042, USA E-mail: Alexandra.Snyder@inova.org

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Figure 1A: Axial, with measurements 403.8 mm × 268.9 mm.

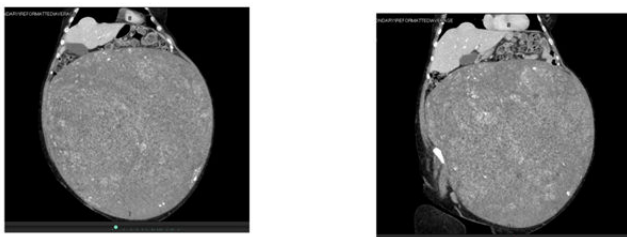


Figure 1B-1C: Coronal views.

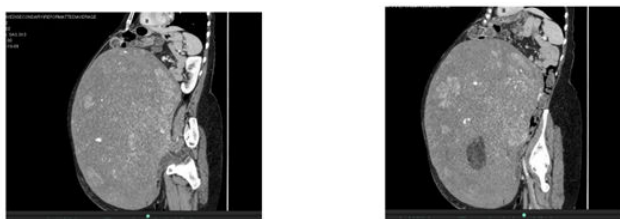


Figure 1D-1E: Sagittal views demonstrating heterogeneity inside the tumor body.

Intraoperatively, the mass appeared consistent with a smooth muscle neoplasm and was found to originate from the lower uterine segment and cervix. The hypogastric arteries and vessels of the infundibulopelvic ligament were suture ligated bilaterally prior to resection of the uterus or leiomyoma. The mass was resected en bloc with the uterus and a section of the bladder serosa muscularis due to dense fibrosis and size of the mass. The bladder was noted to be markedly deviated due to mass effect from the tumor, and was sharply dissected off the lower uterine segment, cervix, and vagina. The pararectal and paravesical spaces were developed and the ureters dissected throughout their pelvic course. The hypogastric arteries were ligated with 0-Vicryl suture 3 cm from the bifurcation of the common iliac artery. The infundibulopelvic ligaments were then transected and suture ligated during direct visualization of the ureters. The bladder was retrograde filled during dissection of the tumor from the bladder wall and was oversewn due to the en bloc serosal resection.

Entry into the anterior and posterior vagina was then achieved to allow transection of the cardinal and uterosacral ligaments. Cystoscopy confirmed bladder and ureteral integrity. No

obvious extra pelvic disease was appreciated. A JP drain was placed in the pelvis for post-operative fluid drainage.

Frozen section pathology was consistent with benign spindle cell leiomyoma. Estimated blood loss was 350 cc. She experienced transient hypotension and hypoxia intraoperatively which resolved without the need for resuscitation.

Post operatively, she remained hemodynamically stable on room air and never required blood transfusion. Due to concern for fluid shifts, she was monitored in the intermediate care unit following surgery and was transferred in stable condition to the gynecology floor on POD#2 (post-operative day #2). She received CBC and coagulation studies every six hours. The urinary Foley catheter was also maintained to monitor strict intake and output.

Postoperative ileus was seen on abdominal x ray on POD#5. However, bowel function returned with passing flatus on POD#6 and bowel movement on POD#7. By POD#8 she had advanced to a regular diet and the urinary Foley catheter was removed. She was able to void spontaneously and was discharged home in stable condition on POD#9

Pathology showed uterus weighing 90 g and a subserosal lipoma leiomyoma weighing 45,000 g (99.2 lbs) and measuring 45 cm. Additional submucosal, intramural and subserosal leiomyomata were noted ranging from 0.5 to 2.0 cm (Figure 2).



Figure 2: Gross specimen following en-bloc resection. Total mass 45 kg (99.2 lbs).

DISCUSSION

Hypotension and fluid shifts are anticipated following resection of large intra-abdominal masses. While our patient remained hemodynamically stable on room air in the immediate post-operative period, she did undergo a period of hypotension intraoperatively and was therefore monitored in the intermediate care unit following surgery. While our patient did not require blood transfusion, blood and fluid loss should be anticipated and closely monitored during surgery and in the post-operative period.

Many of the case reports describe, as in our case, a massive giant myoma attached to an otherwise normal sized uterus though typically with significant blood loss requiring transfusion.

Many cases report postoperative hemorrhage. 1,5 Furthermore, a case series of two patients each with a giant fibroid weighing 40 and 43 kg describes significant pre-operative complications of pulmonary hypertension-associated respiratory failure and severe anemia with Hgb 3.9 g/dL, respectively Ting Lim et al. [3] report a blood loss of 7 liters during resection of a 27.8 kg fibroid requiring activation of the massive transfusion protocol. This was then further complicated by hemorrhagic shock and coagulopathy [4].

The second largest uterine leiomyoma ever removed from a living patient, and the largest originating from the uterine corpus, was reported in 1973 and was found to be 45.45 kg. The patient received a total of 15 units of blood intra- and post-operatively and required re-exploration due to hemorrhage. At that time, she was found to have active bleeding from the bilateral and infundibulopelvic ligaments [2].

As noted, a 51 kg leiomyoma was discovered originating from the broad ligament and was successfully removed in two pieces. Similar to our case, the tumor was found to be of spindle cell pathology. The tumor was receiving a large amount of blood supply from the infundibulopelvic vessels and resulted in a blood loss of 2.5 L requiring 8 units of PRBC transfusion. This appears to be the largest gynecologic leiomyoma ever surgically removed from a living patient, although not originating from the uterine body proper. However, the patient developed postoperative complications of anemia, electrolyte imbalance, vaginal cuff defect causing pneumoperitoneum, and catheter associated. coli urinary tract infection. The patient was discharged to rehabilitation on post-operative day 10 [5].

In our case, our patient underwent successful surgical resection of a giant fibroid of incredible mass with comparatively minimal blood loss. Transient intraoperative hypotension resolved without the need for blood transfusion or massive crystalloid resuscitation. The patient maintained hemodynamic stability post operatively. This is likely due to ligation of all major vessels prior to dissection of the fibroid, and the anatomic and surgical planes that favored resection without hemorrhage. It appears to be the third largest uterine leiomyoma ever removed from a living patient as documented in medical literature. However, this case demonstrates the least loss of blood of any reported surgical resection of a massive leiomyoma, and no significant postoperative complications.

The initial step of ligation of both hypogastric and infundibulopelvic vessels may have contributed greatly to the prevention of blood loss in this particular case. Hypogastric (internal iliac) artery ligation is a technique most common in hysterectomy after cesarean delivery or during obstetric hemorrhage, but is not documented in the surgical reports of other giant leiomyoma resections. Even in obstetric surgical interventions, it is utilized less often than other techniques due to the need for entry into the retroperitoneum. The technique involves entering retroperitoneally by opening the broad ligament and developing the paravesical and pararectal spaces. The external iliac artery is identified and followed up to the common iliac artery bifurcation. The internal iliac artery located medially and is approximately 4 cm in length until it divides into the anterior and posterior branches. The ureter travels

along the medial leaflet of the broad ligament and crosses over the common iliac bifurcation. The anterior division of the internal iliac vessels are skeletonized by meticulous technique. Once the internal iliac artery is dissected, a 1-0 non-absorbable suture is passed around the artery approximately 2 cm distal from the bifurcation from a lateral to medial approach. Careful attention is given to placing the tie securely without pulling on the vessel (Figure 3) Care is needed to avoid damage to the nearby ureter and thin-walled iliac vein lying posterior to the internal iliac artery.

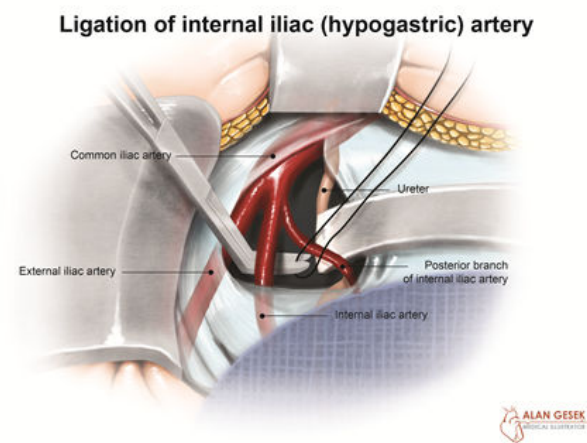


Figure 3: Surgical technique to internal iliac (hypogastric) artery ligation.

The primary benefit comes from an 85% reduction in pulse pressure through the arteries distal to the ligation, reducing arterial flow to a level similar to venous flow. 6 However, it is rarely mentioned as a technique for gynecologic surgery. A Pubmed search revealed only one randomized trial examining hypogastric artery ligation during radical hysterectomy and results of that study did not show a significant decrease in blood loss [6-8]. Because giant leiomyomata are rare and the opportunity for exploring surgical technique is consequently limited, the benefit of hypogastric artery ligation during resection requires additional study.

CONCLUSION

Therefore, it is clear that even with careful surgical technique, significant blood loss should be anticipated during surgical resection of giant leiomyomata. Close perioperative monitoring for hemorrhage, anemia, fluid shifts and electrolyte imbalances are essential.

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