UTERINE FIBROID EMBOLIZATION FROM START TO FINISH

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FINANCIAL DISCLOSURES

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LITERATURE

- Accepted by the American Congress of Obstetrics and Gynecology, Uterine Fibroid Embolization is an established alternative to surgical hysterectomy\(^1\).
- The results of the controversial EMMY Trial initially revealed overall complication rates\(^2\):
  - Major Complication: 4.9% vs 2.7% in hysterectomy group
  - Minor Complication from discharge – 6 weeks: 58% vs 40% in hysterectomy group
- 5 year follow up of the EMMY Trial reported similar health related quality of life (HRQOL) and improved urinary symptoms and defecation function\(^3\).
- Another study revealed no significant differences between UFE and hysterectomy group with overall similar quality of life at 12 months\(^4\).
  - UFE was associated with significantly faster recovery while posting a 1 year major adverse event rate of 12% when compared to 20% in the hysterectomy arm.
  - 9% required repeat embolization or hysterectomy for inadequate symptom control.
Indications⁵.

- Uterine Fibroids
  - Pelvic pain
  - Menorrhagia.
  - GU/GI manifestations.
- Adenomyosis
- Postpartum Hemorrhage
- Uterine Artery Pseudoaneurysms
  - Hysterectomy
  - Caesarean section
- Uterine AVM
  - Traumatic

Contraindications

- Minor
  - Contrast Allergy
  - Coagulopathy
  - Renal Failure
  - Desire to remain fertile
  - GnRH
  - Prior Radiation
- Absolute
  - Pregnancy
  - Malignancy
  - Active infection.
  - Immunosuppression
CLINIC CONSULT

Symptom Evaluation
- Pain
  - Characterization
  - Chronicity
  - Alleviation
- Genitourinary Systems
  - Dysuria
  - Polyuria
  - Constipation

Menstrual History\(^6\).
- Menorrhagia:
  - Prolonged bleeding lasting longer than 7 days
- Length of cycle
- Number of heavy-flow days
- Frequency of Tampon/pad changes
- Dysmenorrhea
MR IMAGING

- **Examination Technique**: 7.
  - Pelvic phased array coil
  - 4-6 hour preimaging fast: Decreases peristalsis
  - Sequences
    - Orthogonal T2-W FSE
    - Axial T1-W
      - With and without FS
    - Precontrast and Dynamic Post Contrast T1-W FS Gradient echo images
    - Optional DWI with ADC.

- **Location**: 8:
  - Subserosal: beneath serosa
  - Intramural: within myometrium
  - Submucosal: beneath mucosal lining
    - Pedunculated: relative contraindication.
  - Intracavitary Fibroids
    - Post embolization expulsion may lead to pain, cramping, or infection 5.
  - Cervix
    - Enhancement
PROCEDURE

- Commonly performed from bilateral femoral, unilateral femoral, or transradial approaches
- Right common femoral artery access with placement of 5 French vascular sheath
- Reverse curve flush catheter (RCFC) placed in abdominal aorta and aortoiliac angiography performed
- RCFC used with 0.035” wire to select left common iliac artery
- RCFC exchanged for 5 Fr angled glide catheter which is used to select left internal iliac artery
- Subselective angiography performed and microcatheter/microwire used to select uterine artery
- DSA performed and microcatheter advanced beyond non-target branches in the horizontal segment
- DSA performed to reconfirm visualization of fibroids and lack of non-target extrauterine branches
- Embolization performed under live fluoroscopy with 500-700 micron calibrated microspheres
- Periodic flushing with 1 ml 1% Lidocaine IA
- Completion DSA with endpoint reached when sluggish flow demonstrated in uterine artery and diminished vascularity to the uterine fibroids
- Microcatheter removed
- Glidewire and left internal iliac angled glide catheter used to form Waltman loop in the abdominal aorta
- Looped glide catheter used to select right internal iliac artery and DSA performed
- Microcatheter used to select right uterine artery and DSA performed with subsequent embolization performed as on the left side
- Equipment removed and right CFA hemostasis achieved
Figure #1 demonstrates a right femoral access pelvic arteriogram in AP projection. The patient was a 38 year old female, who complained of menorrhagia and pelvic pain. MR imaging demonstrated a solitary intramural fibroid, measuring 5.6 x 6.3 x 6.3 cm and centered in the fundus.

Anatomy
- A) Aorta
- B) Common Iliac Artery
- C) External Iliac Artery
- D) Internal Iliac Artery
- E) Common Femoral Artery
- F) Deep Femoral (Profunda) Artery
- G) Superficial Femoral Artery
- H) Uterine Artery
- I) Superior Gluteal Artery
- J) Obturator Artery
CASE CORRELATION

43 year-old white female with a history of 3 prior Cesarean sections. She presents to the clinic with menorrhagia, lower abdominal pressure, and cramping during menses. She reports monthly menses lasting approximately 7-8 days with heaviest days changing her tampons every 2-3 hours. Her symptoms have worsened over the past 2-3 years. She does not desire to maintain her fertility.

MR Imaging demonstrates an enlarged uterus with a dominant enhancing intramural fibroid along the dorsal aspect of the uterine body, figure 2.

Figure 3 demonstrates left radial approach aortogram with enlargement and tortuosity of the bilateral uterine arteries. A microcatheter was than used to cannulate the right uterine artery, figure 4. The large fibroid was visualized and 500-700 micron Embospheres were administered. Figure 5 demonstrates pruning of uterine artery branches and decreased flow.
## ORders

### Preprocedure
- Vital Signs
- Cardiac Monitor
- Pulse ox
- Foley Catheter
- NPO
- Labs
  - PT/INR, CBC, CMP, B-hCG
- IVF: 0.9NS at 150-200 ml per hour
- Prophylaxis:
  - Rocephin 1G, Zosyn 3.375G, Ampicillin 2G, or Vancomycin 1G
- Toradol 30mg IV prior to procedure
- Sedation:
  - Versed and Fentanyl OR Anesthesia with MAC

### Postprocedure
- Vital Signs and neuro checks
- Monitor Puncture site
- Keep punctured extremity straight and immobile for 2 hours if closure device was used
  - 6 hours if no closure device
- Keep supine
- Remove Foley at midnight, Ambulate prior to DC
- Dilaudid PCA:
  - Bolus dosing 0.1-0.2 mg every 10 min with 10 min lockout.
  - May consider 1mg/hour basal rate with increase to 2mg basal rate/hr and up to 0.4 mg dilaudid every 10 min.
- Ibuprofen 600 mg QID
- Toradol 30mg IV q 6 hours
- Antiemetics: Zofran, Decadron, Ativan

### Discharge Medications and Instructions
- Levoquin 500 mg PO for 10 days
- Ibuprofen 600 mg PO q6 hours for 10 days PRN pain
- Oxycodone 5 mg PO, 1-2 tabs q 4-6 hours PRN pain
  - Zofran 4 mg PO q8 hours PRN nausea
  - Follow up in clinic in 1 week or if symptomatic
  - Follow up MRI in 3 months.
COMPLICATIONS

- Post Embolization Syndrome
  - Fever, Nausea, Emesis, Pain, and Malaise
- Pulmonary Embolism
- Non-target embolization
  - Ovaries
  - Labial necrosis
  - Buttock Necrosis
  - Lower Extremity
- Sexual Dysfunction

- Incomplete Embolization
- Fibroid Regrowth
- Uterine infection
- Uterine Necrosis
- Uterine Artery Rupture/Dissection
- Minor Complications
  - Pain
  - Hematoma
  - Access
    - Pseudoaneurysm
    - AV Fistula
REFERENCES


