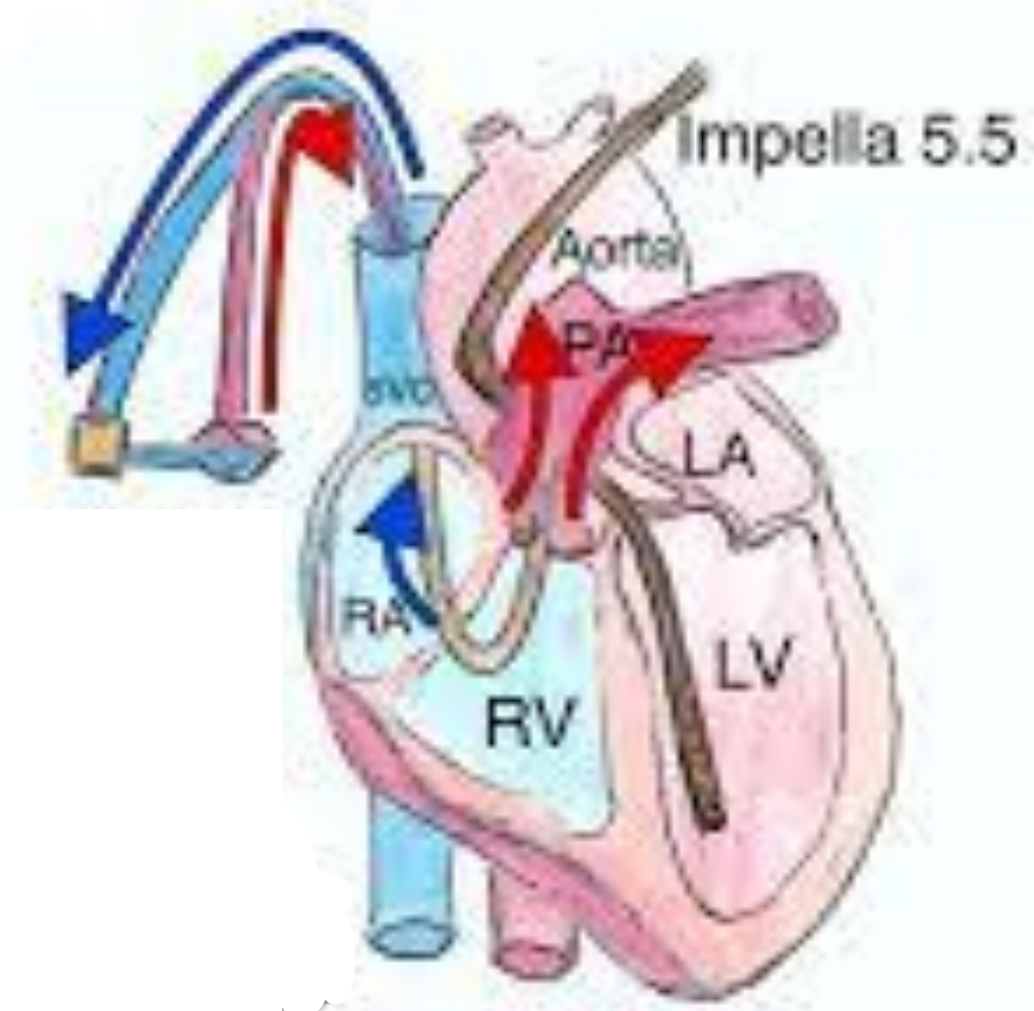


## Background

- Postpartum cardiomyopathy can result in life-threatening cardiogenic shock (CS) with the need for mechanical circulatory support (MCS).
- MCS increases the risk of bleeding due to blood trauma and the need for systemic anticoagulation.
- Bleeding typically occurs at surgical site, along the gastrointestinal tract, or intracerebrally.
- In the early postpartum period, MCS presents a risk for severe uterine bleeding (SUB).
- We present a new treatment strategy for rapid control of SUB in patients on circulatory support devices.

## Case Study Timeline

- Previously healthy 22 y/o female gravida 1/ para
- 18 weeks postpartum and s/p dilation and curettage for retained products of conception presented in CS with EF 15% and severe end-organ failure
- She was placed on femoral venoarterial extracorporeal membrane oxygenation (ECMO) with Impella CP for LV venting, renal replacement therapy and mechanical ventilation.
- After stabilization of initial CS, she was transitioned to Impella 5.5 and a percutaneous right ventricular assist device (Spectrum cannula), came off renal replacement and mechanical ventilation and ambulated
- Intraoperatively, SUB began and dropped HGB < 6 g/dl



## Hemorrhagic Management

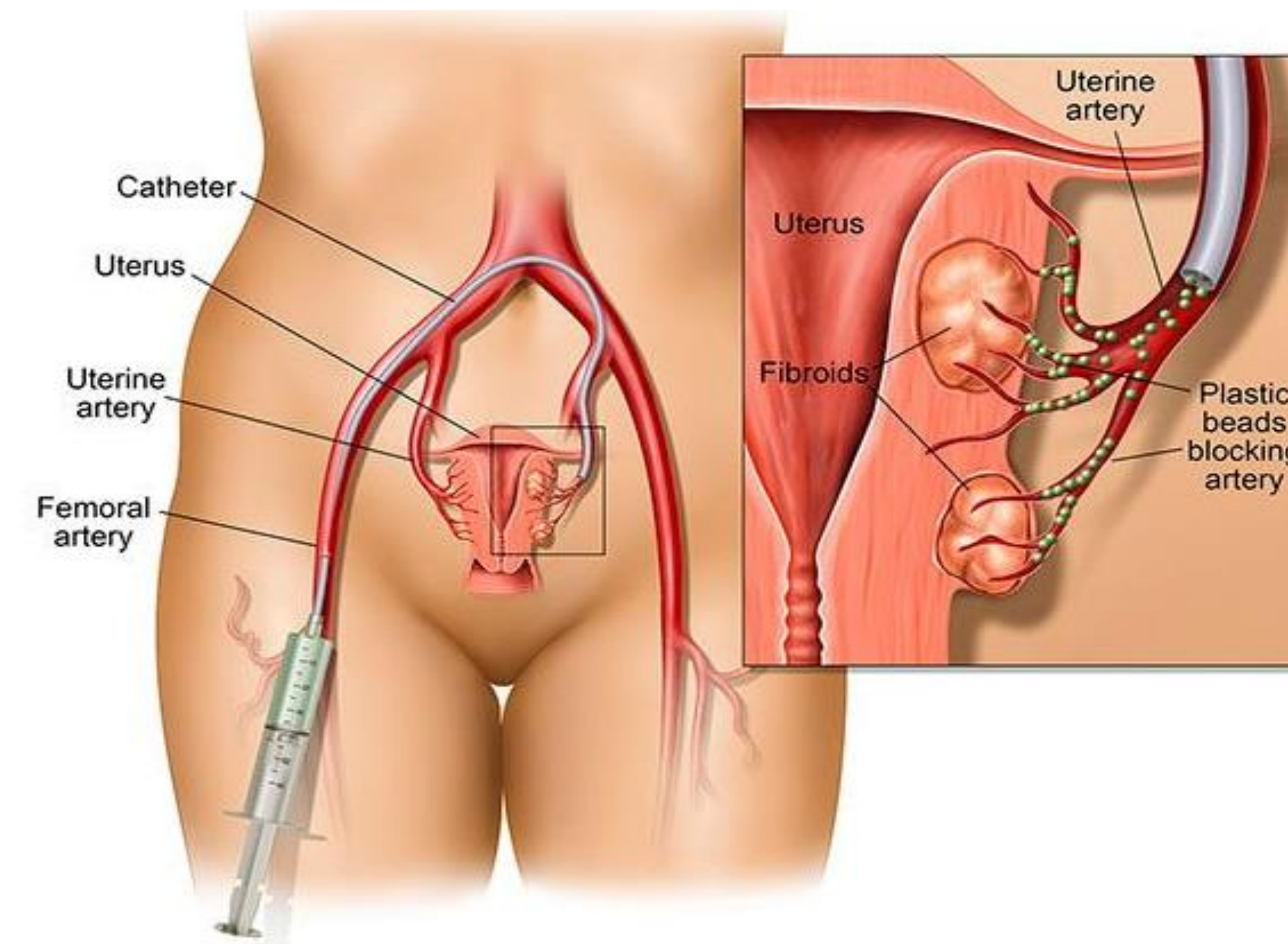
### Conservative Treatment

1. Stop systemic anticoagulation – *unsuccessful*
2. Hormonal Therapy
  - Medroxyprogesterone - *unsuccessful*
  - Misoprostol – *unsuccessful*
3. Antifibrinolytics – tranexamic - *unsuccessful*
4. Blood Product Transfusion – relatively contraindicated due to allosensitization risk and implication for finding a suitable donor for heart transplant

### Evaluated Additional Options

1. IUD Insertion – delayed onset of therapeutic effect for critically ill patient
2. Hysterectomy – aggressive, but definitive option for a young patient
3. Uterine Artery Embolization (UAE) – definitive, sudden onset of therapeutic effect, and minimally invasive

### Successful trans-femoral bilateral UAE was performed



## Results

- After UAE SUB immediately stopped
- Treatment with concomitant daily iron infusions, oral folate and vitamin B12 supplementation, and subcutaneous recombinant erythropoietin injections three times per week.
- Eight days after UAE, HGB levels back up to 7.7 g/dL Successful heart transplant
- Six months post UAE, regular menstrual period with increased menstrual bleeding, likely attributed to long-term anticoagulation post-transplant.

## Conclusion

- Choosing UAE over other options to control SUB on MCS was motivated by the ability to rapidly stop bleeding in a minimally invasive fashion and the lack of prothrombotic side effects
- UAE is effective and safe on MCS.
- If utilized early enough, UAE may allow avoidance of blood product transfusion and continuation of anticoagulation to avoid pump thrombosis.

## References

1. Ali JM, Abu-Omar Y. Complications associated with mechanical circulatory support. *Ann Transl Med.* Jul 2020;8(13):835. doi:10.21037/atm.2020.03.152
2. Dhamangaonkar PC, Anuradha K, Saxena A. Levonorgestrel intrauterine system (Mirena): An emerging tool for conservative treatment of abnormal uterine bleeding. *J Midlife Health.* Jan-Mar 2015;6(1):26-30. doi:10.4103/0976-7800.153615
3. LaVasseur C, Neukam S, Kartika T, Samuelson Bannow B, Shatzel J, DeLoughery TG. Hormonal therapies and venous thrombosis: Considerations for prevention and management. *Res Pract Thromb Haemost.* Aug 2022;6(6):e12763. doi:10.1002/rth2.12763
4. Samuelson Bannow B. Management of heavy menstrual bleeding on anticoagulation. *Hematology Am Soc Hematol Educ Program.* Dec 4 2020;2020(1):533-537. doi:10.1182/hematology.2020000138
5. Scornik JC, Meier-Kriesche HU. Blood transfusions in organ transplant patients: mechanisms of sensitization and implications for prevention. *Am J Transplant.* Sep 2011;11(9):1785-91. doi:10.1111/j.1600-6143.2011.03705.x
6. Van Edom CJ, Gramegna M, Baldetti L, et al. Management of Bleeding and Hemolysis During Percutaneous Microaxial Flow Pump Support: A Practical Approach. *JACC Cardiovasc Interv.* Jul 24 2023;16(14):1707-1720. doi:10.1016/j.jcin.2023.05.043