

CAUSES OF POSTPARTUM HEMORRHAGE (PPH)

Maria Giroux, HBSc, MD

Illustrations by Nitasha Salim, BSc

Etiology (4 Ts)

Tone (abnormal uterine contraction)	Tissue	Trauma	Thrombin
<ul style="list-style-type: none"> • Uterine atony (most common, most important) (failure of uterus to contract adequately after delivery) • Distended bladder 	<ul style="list-style-type: none"> • Retained blood clots • Retained placenta • Retained products of conception 	<ul style="list-style-type: none"> • Lacerations- uterine, cervical, vaginal • Uterine rupture 	<ul style="list-style-type: none"> • Coagulopathy (pre-existing or acquired)

- 5th T= traction
 - Fundal placenta- uterine inversion
 - Placenta accreta, increta, percreta

Delayed PPH:

- 4 Ts
- Infection
- New pregnancy
- GHTN

Etiology (4 Ts)

Tone

Abnormal uterine contraction

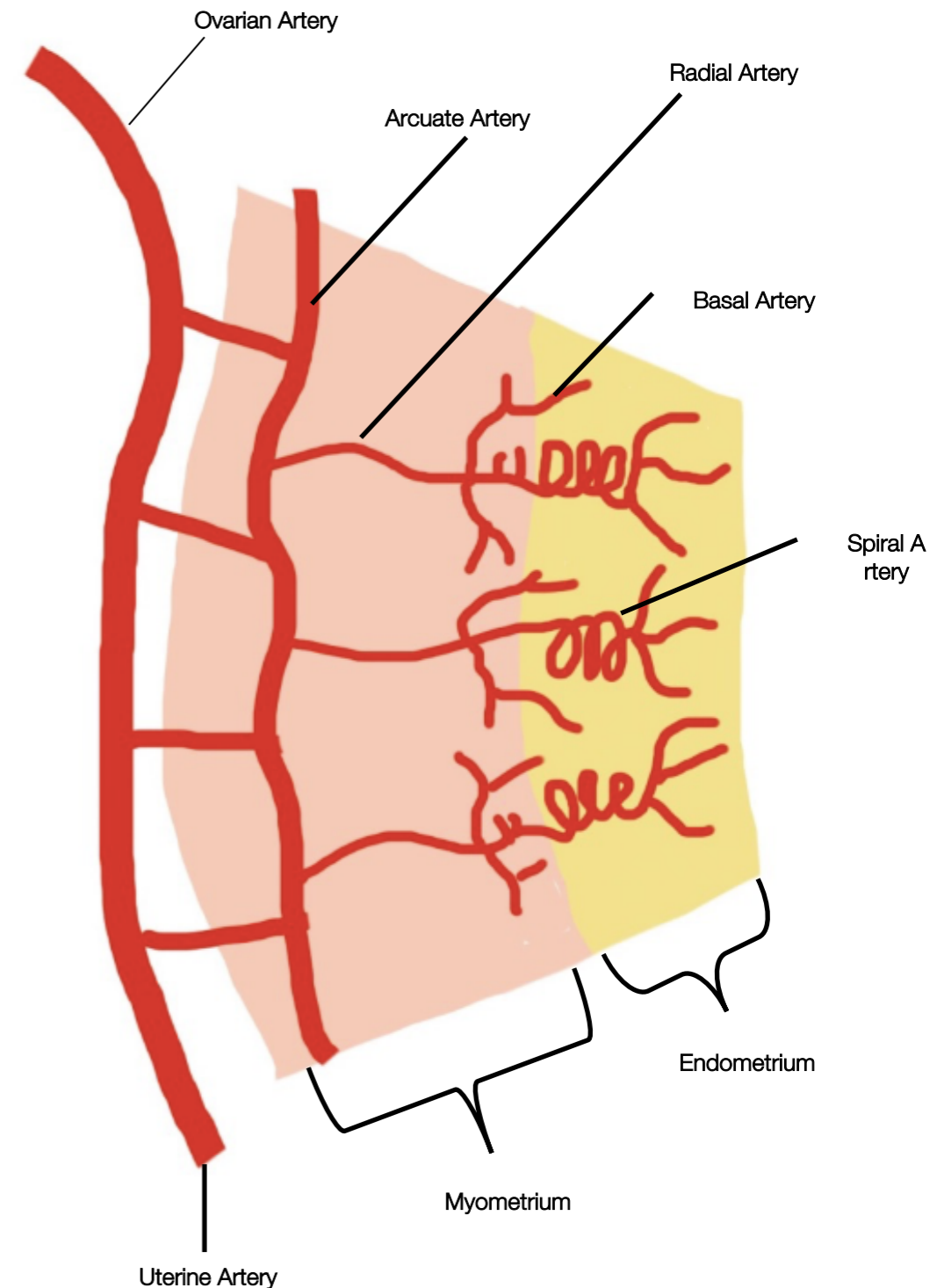
- Uterine atony (failure of uterus to contract adequately after delivery)
- Distended bladder (prevents uterine contraction)

RF:

- Over-distended uterus
 - Polyhydramnios
 - Macrosomia
 - Multiple gestation
- Uterine muscle exhaustion
 - High parity
 - IOL, oxytocin use
 - Precipitous delivery
 - Prolonged labour
- Chorioamnionitis
 - Fever, prolonged ROM
- Anatomic distortion of the uterus
 - Fibroids
 - Uterine anomalies
 - Placenta previa
 - Velamentous cord insertion
- Uterine relaxing medications, bladder distension
 - Nitroglycerin, tocolytics
 - Halogenated anesthetics

Uterine Atony

- Most common and most important cause of PPH
- Myometrial blood vessels are present between muscle cells of uterus
- Myometrium contracts immediately after delivery → occlusion of uterine blood vessels → stops blood flow, causes placenta to separate
 - "Live ligature"



Etiology (4 Ts)

Tissue

- Retained blood clots
- Retained placenta
- Retained products of conception

RF:

- Retained products of conception
 - Abnormal placentation
 - Retained cotyledon or **succenturiate lobe**- will see blood oozing from placenta if a piece of placenta is missing
 - Abnormal placenta on US
 - High parity
 - Incomplete placenta at delivery
 - Hx uterine surgery
- Retained blood clots
 - Atonic uterus

Etiology (4 Ts)

Trauma

- Lacerations- cervix, vagina, perineum
- Extensions, lacerations at C/S
- Uterine rupture
- Uterine inversion

RF:

- Lacerations of cervix, vagina, perineum
 - Precipitous delivery
 - OVD
- Extensions, lacerations at C/S
 - Deep engagement
 - Malposition
- Uterine rupture
 - Hx uterine surgery
- Uterine inversion
 - Fundal placenta
 - High parity

Etiology (4 Ts)

Thrombin

- Coagulopathy (pre-existing or acquired during pregnancy)

RF:

- Pre-existing coagulopathy
 - Hx PPH
 - Prior treatment with embolization (39%)
 - Prior treatment with ligation(26%)
 - Hemophilia A
 - VWD
- Acquired during pregnancy
 - ITP (idiopathic thrombocytopenic purpura)
 - Pre-eclampsia, ↓ platelets
 - DIC
- Gestational HTN with adverse conditions
- IUFD
- Severe infection
- Placental abruption
- Amniotic fluid embolus (sudden collapse)
- Meds: anticoagulation therapeutically (ex. Enoxaparin) for thrombotic disease

Other Risk Factors for PPH

Other RF PPH:

- BMI >30
- SSRI
- ↑ time for placenta to deliver

References

Butler, K., Dore, S., Baxter, H., Clark, V., Leduc, D., Cowal, C., Delisle, C., Ditommaso, S., Mareschal, V., Martel, M., Hey, J. (2017). *Advances in Labour and Risk Management (ALARM) Course Manual* (23rd ed.).