# Successful management of a supralevator intraperitoneal puerperal hematoma with angiographic embolization

Fatimah Z. Fahimuddin, MD,[1] Andrea Seid, DO,[1] Anubhav Agrawal, MD[1]

**Keywords:** Vaginal delivery, persistent occiput posterior, puerperal hematoma

***Abstract***

*Puerperal hematomas are rare, yet often life threatening, complications following vaginal deliveries. The etiology remains broad; however, early recognition is vital in preventing postpartum hemorrhage and maternal death. Our case illustrates treatment of a supralevator hematoma with angiographic embolization following a spontaneous vaginal delivery in a young woman. Her labor course was complicated by persistent occiput posterior presentation that failed spontaneous and manual rotation.*

*[1]Department of Obstetrics and Gynecology, University of California, San Francisco - Fresno Medical Education Program, Fresno, CA*

## Introduction

The incidence of puerperal hematomas ranges from 1/300 to 1/1400 and is associated with injury to the pelvic vasculature.[1] Nulliparity, operative vaginal delivery, breech delivery, multiple gestation, prolonged second stage of labor, birth weight greater than 4000 g, vulvar and pelvic varicosities, hereditary clotting deficiencies, and pre-eclampsia are known risk factors for hematoma formation.[1-2] However, a review of the literature demonstrates that puerperal hematomas often arise in the absence of these risk factors, usually in the setting of a spontaneous vaginal delivery.[3]

A thorough understanding of pelvic anatomy gives rise to the classification of puerperal hematomas. Infralevator hematomas, which include vulvar hematomas, are due to the rupture of pudendal artery branches. These hematomas are usually self-limited because they are confined to a small space secondary to the perineal membrane.[1] Vaginal hematomas may occur from bleeding from the descending branches of the uterine arteries. If there is bleeding above the levator ani, it is considered a supralevator hematoma. Although uncommon, these can extend into the

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***Corresponding author:*** *Fatimah Fahimuddin, MD, Department of Obstetrics and Gynecology, University of California, San Francisco – Fresno MEP, 155 N. Fresno Street, Fresno, CA 93701 Email address: ffahimuddin@fresno.ucsf.edu*

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retroperitoneal space resulting in a rapid increase in maternal morbidity and mortality. Treatment of such hematomas range from conservative management to exploratory laparotomy or arterial embolization.[1,3-8]

Our case illustrates treatment of a supralevator hematoma with angiographic embolization following a spontaneous vaginal delivery in a young woman. Her labor course was complicated by persistent occiput posterior presentation that failed spontaneous and manual rotation. A literature review revealed no other reports of supralevator hematomas associated with persistent occiput posterior presentations. An informed consent was obtained for this case report. Institutional Review Board exemption was obtained.

## Case

A 21-year-old gravida 3, para 1, presented to the labor and delivery ward at 39 weeks and 5 days gestation in active labor. Her obstetrical history included one elective termination and one preterm delivery at 35 weeks gestation secondary to placental abruption. The patient's pregnancy course was otherwise uneventful, and at the time of admission, her cervical exam was 8 cm dilated, 80% effaced, and the fetus was at -2 station. She received an epidural and quickly entered the second stage of labor. Her labor course was complicated by persistent occiput posterior presentation. Despite having an epidural, the patient was unable to tolerate attempts to manually rotate the fetus to a more favorable position. She subsequently delivered a healthy 2910 g female infant in the direct occiput posterior presentation. The placenta spontaneously delivered and a second degree perineal laceration was repaired, with a total quantitative blood loss of 103 ml.

Less than two hours postpartum, the patient started to report significant left, deep buttock pain. On exam, there were no signs of postpartum hemorrhage and the patient was hemodynamically stable. She was given opiates for pain relief, but the pain persisted. As the patient was under distress, she was taken to the operating room for an exam under anesthesia. There were no overt signs of a hematoma or deep laceration upon exam and she tolerated the procedure well. Once out of the operating room, the patient continued to complain of the same deep, left buttock pain. The decision was then made to send the patient for a computed tomography (CT) scan for further investigation.

The CT scan demonstrated a large supralevator intraperitoneal left pelvic sidewall hematoma measuring 11.6 x 8.6 x 9.1cm with possible compression of the pelvic side wall nerve plexus (Figure 1). Furthermore, it displaced the colon, cervix, and rectum to the right. The hematoma was not actively expanding. As the patient was hemodynamically stable during this time, the vagina was packed and a Foley catheter was placed to avoid urethral kinking and urinary retention.

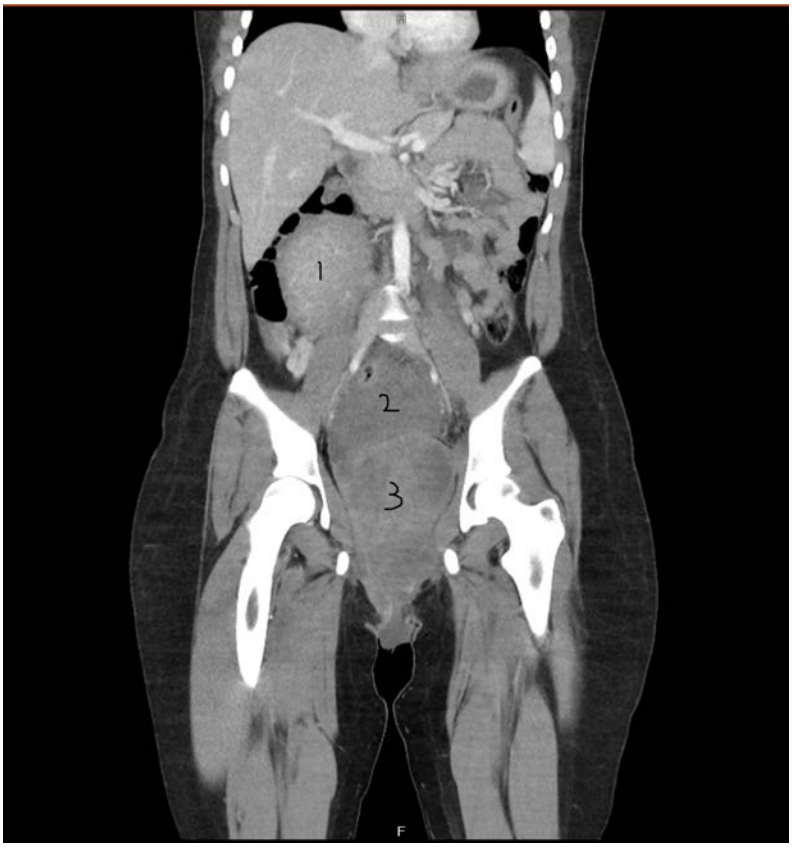


**Figure 1: supralevator intraperitoneal hematoma displacing postpartum uterus and bowel. “1” denotes the superiorly displaced uterus, “2” is the hematoma, and “3” is the bladder.**

The patient’s pain was managed with a morphine patient controlled analgesia pump. On admission, her hemoglobin was 10.5 g/dl, but after imaging, it was 8.4 g/dl. Her hemoglobin continued to downtrend, with it being 7.5 g/dl on postpartum day one, and 6.6 g/dl the following day. She was hemodynamically stable and asymptomatic with her heart rate in the 100s beats per minute, and blood pressures stable in low 100s/60s. She met all appropriate postpartum milestones within the first day. However, we counseled the patient for a blood transfusion and bilateral uterine artery embolization given her decrease in hemoglobin in the setting of being hemodynamically stable.

She was transfused with two units of packed red blood cells and transferred to interventional radiology, where her bilateral uterine arteries were embolized with polyvinyl alcohol foam. A post embolization angiogram demonstrated complete occlusion of the vessels (Figure 2). The patient tolerated the procedure well. Following embolization, the patient was ambulating, spontaneously voiding, and her pain was adequately controlled on oral nonsteroidal anti-inflammatory medications. On postpartum day three,

her hemoglobin was 9.5 g/dl and she was discharged. Two weeks postpartum, the patient's hemoglobin was 11.7 g/dl and she was recovering well without complaints.

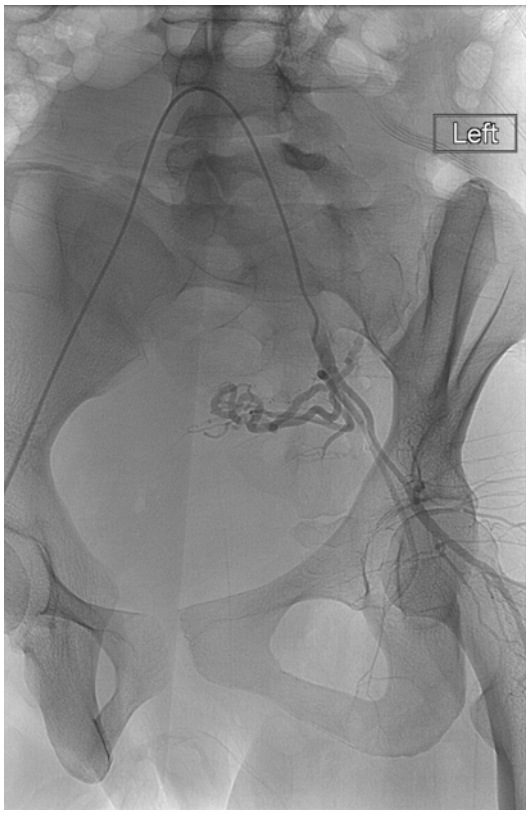


**Figure 2: Angiographic embolization of the left anterior division of the uterine artery**

## Discussion

Supralevator puerperal hematomas are rarely seen following spontaneous vaginal deliveries but can quickly give rise to maternal morbidity and mortality. Our patient did not have any known risk factors predisposing her to developing a hematoma; however, her delivery was complicated by persistent occiput posterior presentation. Current literature demonstrates that the incidence of occiput posterior presentation ranges from 5-12%.[8] Persistent occiput posterior presentation is associated with an increased risk for cesarean section, instrumental intervention, prolonged second stage of labor, and third and fourth degree lacerations.[8] As puerperal hematomas are also associated with prolonged second stage of labor, persistent occiput posterior presentation likely is a risk factor for puerperal hematoma formation. Manual or digital rotation can be attempted to reduce these risks by manipulating the fetus' presentation to a more favorable one, but this is marked by limited success.[1,8] Our patient failed three attempts to manually rotate her fetus. Whether the

patient had arteriovenous malformations or pelvic varicosities that were disrupted during these attempts leading to a hematoma forming is also possible.

Early recognition is key in treating patients with supralevator hematomas. The unrelenting, deep buttock pain is characteristic of these lesions and is often associated with urinary retention due to possible urethra kinking.[5] Other signs are nonspecific and can include hemodynamic instability or Cullen's sign, which can be indicative of retroperitoneal spread.[2]

Treatment of these lesions continues to vary due to the rarity of this complication. Some clinicians favor more invasive techniques, such as exploratory laparotomies, while others utilize conservative measures, including ultrasound guided needle aspiration or tamponading lesions with Bakri balloons.[6-7] A few case reports demonstrate the growing favorability of arterial embolization, but not without consequence.[3,6] Yamashita et al. describes six cases of genital tract injury including four cases of paravaginal and/or retroperitoneal hematoma formation secondary to operative vaginal deliveries that were treated with arterial embolization. The author notes some patients can develop necrosis of the bladder or rectum with embolization of the internal iliac artery secondary to localized ischemia.[6] Distefano et al. proposes a succinct algorithm on the management of puerperal hematomas and the usefulness of arterial embolization, but also demonstrates the need for more data concerning the best management.[3] Despite treatment modality, CT scan remains the forefront in diagnosis.[1,3]

## Conclusion

Our case report provides evidence that arterial embolization may be indicated for prophylactic treatment of women with puerperal hematomas. Furthermore, persistent occiput posterior presentation may be a risk factor for such hematoma development. Although this report does not provide conclusive evidence, we hope it provides insight into the management of this postpartum complication in order to decrease maternal morbidity and mortality.

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