



Superficial Serosal Uterine Varicosity Causing Intraoperative Bleeding During Cesarean Delivery: A Case Report and Review

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Abstract

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BACKGROUND: Superficial serosal uterine varicosity (SSUV) is a rare anomaly commonly seen in non-pregnant individuals, and its presence in pregnancy is seldom reported. Here we present a case of SSUV that was accidentally discovered during an elective Cesarean delivery, causing unexpected bleeding. **CASE PRESENTATION:** A 30-year-old pregnant woman at 37 weeks of gestation with three previous Cesarean deliveries attended our clinic for an elective appointment; her past medical and surgical history was unremarkable. Laboratory investigations were normal, and Doppler ultrasound showed a fundo-anterior placenta, normally situated, with no signs of placenta accreta. During an otherwise uneventful surgery, a brisk haemorrhage occurred near the incision site following complete placental delivery. A dilated tortuous vein was identified as the bleeding source, and hemostasis was secured by ligation and oxytocic drugs. **CONCLUSION:** SSUV is an uncommon cause of bleeding during Cesarean delivery; as it escapes antenatal imaging, it imposes diagnostic challenges and increases bleeding and transfusion demands.

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1. INTRODUCTION

Cesarean section (C-section) is the most common obstetric surgical procedure worldwide, and haemorrhage during C-section is a well-recognized complication. Superficial uterine serosal varicosities (SSUV) are rare vascular anomalies seen in reproductive-age women, primarily among cases with a history of prior uterine surgeries, such as C-section. They tend to manifest as dilated tortuous veins confined to the serosa and lack the A-V shunting that characterizes a true A-V malformation, which extends into the myometrium¹. These vessels may not be detected antenatally and may present intraoperatively as unexpected bleeding, highlighting the challenges in preoperative diagnosis. Several mechanisms may contribute to SSUV development during pregnancy, including: Physiological adaptation: in pregnancy, there is marked vascular remodeling in the uterine vasculature to meet increased perfusion demands, which may sometimes be reflected as exaggerated, visibly dilated vessels². Iatrogenic or post-surgical changes: repeated C-section can trigger abnormal vascular growth within the scar tissue, even in the absence of placenta accreta syndrome¹. On rare occasions, a congenital AVM may be discovered intraoperatively with bleeding³. We present

a rare case of abnormal superficial uterine vessels identified during an elective repeat cesarean delivery in a multiparous woman, managed successfully with vessel ligation and supportive care.

2. CASE PRESENTATION

A 30-year-old woman, gravida 4 para 3 (all previous cesarean deliveries), presented to the outpatient clinic at 37 weeks' gestation for an elective repeat C-section. Her past medical, surgical, and drug history were unremarkable, and she reported an uneventful antenatal course. The laboratory investigations were within normal limits. Doppler ultrasound confirmed an anterior-lateral placenta, not low-lying, with no evidence of placenta accreta spectrum. The C-section was performed under general anesthesia via a lower uterine segment incision, resulting in the delivery of a healthy term male. The placenta was delivered intact without difficulty, and no adhesions were noted. However, brisk haemorrhage was observed at the uterine incision site. After securing hemostasis, multiple dilated, tortuous vessels were visualized over the uterine serosa, consistent with superficial serosal uterine varicosity (Fig. 1). They were carefully ligated, oxytocic drugs were given, and local pressure was applied. An indwelling drain was placed for postoperative monitoring.

The uterus was well contracted; however, the estimated blood loss (650 cc) required a transfusion of packed red cells. There was no other reported complication. Possible differential diagnoses include true uterine A-V malformation, placenta accreta syndrome, uterine pseudoaneurysm, subserosal uterine fibroid with superficial vessels, and uterine hemangioma ⁴.

The patient recovered well, with no further bleeding episodes, and postoperative follow-up was uneventful. On Day 3, both the mother and infant were discharged in good health. The patient was informed regarding her condition and reassured that she would not suffer post-partum complications like those of a true uterine AVM. No contraception restriction is needed in her case; all standard contraception methods were acceptable, with a recommendation of progesterone-only pills or an intrauterine device to reduce estrogen-related venous complications. Careful documentation of her case was provided to minimize risk during future pregnancies.

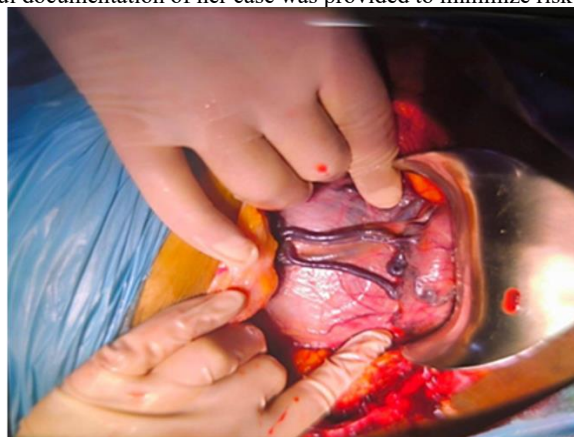


Fig. 1. Intraoperative finding of SSUV. The pathology appears as a dilated, tortuous, bluish vein located within the serosa without extension into the myometrium, as a true A-V malformation does.

3. DISCUSSION

This was a case of abnormal uterine vascularity discovered intraoperatively with no evidence on preoperative imaging, which highlights the diagnostic challenges. Although the placenta was normally implanted and delivered without difficulty, unexpected bleeding occurred from the incision site, necessitating ligation. Several case reports of rupture of superficial uterine varicosities have been described in the literature, summarized in Table 1.

Table 1. Summary of reported cases of SSUV with management and outcome

Author and year	Pregnant?	Case presentation and findings	Management done	Outcome	Ref.
Our case (2025)	Yes, elective repeat C-section	Unexpected bleeding from superficial serosal uterine vessels; moderate blood loss	Intraoperative ligation of abnormal vessels; transfusion; postoperative monitoring	Maternal recovery; healthy baby delivered; no complications	
Nguessan KL et al., 2013	Yes, 35 weeks, twins	Sudden collapse, hypotension, abdominal pain	Emergency laparotomy; rupture of superficial uterine varices controlled with suturing; blood transfusion	Maternal stabilization; C-section delivered healthy babies; placenta normal	5
Jang JH et al., 2016	Yes, 27 weeks	Acute abdominal pain, low Hb (7.2 g/dL), hemoperitoneum	Urgent laparotomy; bleeding varicose vein on fundus; pressure, suturing, local sealant; later admitted till term	Maternal recovery; pregnancy continued to term; C-section; placenta previa with partial accreta → hysterectomy	6

Rokhgireh S et al., 2020	No	Hemoperitoneum from a vein overlying a subserosal fibroid	Diagnostic laparoscopy; 400 mL blood evacuated; myomectomy	Maternal recovery; uneventful post-op	7
Hing Ting Yu et al., 2023	No	Shock due to rupture of the superficial vein on a 10-cm subserosal fibroid; 2000 mL hemoperitoneum	Urgent laparotomy; hysterectomy; pre-op CT did not detect the source	Maternal stabilization; hysterectomy performed; highlights the difficulty of pre-op imaging	8

Management of SSUV involves prompt intraoperative hemostasis, since these vessels are superficial and not associated with the high shunting of a true uterine AVM. The abnormal vessels in the current case were serosal, not intra-myometrial, and were successfully controlled by ligation, suggesting localized venous congestion or collateral circulation rather than a true AVM. Importantly, the absence of placental invasion, normal Doppler findings, and smooth placental delivery support this interpretation. Differential diagnoses of the case include:

1. True AVM.
2. Placenta accreta syndrome: abnormally adherent or invasive placenta into the uterine body that will not come off easily ¹⁰.
3. Ruptured subserosal leiomyoma: a history of leiomyomas that may show increased vascularity on Doppler ¹¹.
4. Ruptured uterus or dehiscent scar: low implantation of the placenta at the scar site with thinning of the endometrial thickness ¹².

As for the true uterine AVM, the differentiation between the two is summarized in Table 2 ^{3,13,14,15}.

Table 2. Comparison of the main differences between our case and true uterine AVM

Feature	Superficial Serosal Venous Uterine Malformation (SSUV)	True Uterine Arteriovenous Malformation (UAVM)
Anatomical location	Confined to serosa/surface veins, no myometrial nidus	Intramyoetrial nidus with direct arterial–venous shunting
Intraoperative appearance	Bluish, tortuous, dilated surface veins; may mimic varicosity	Engorged, pulsatile, tortuous vessels; bluish uterine surface; may extend through the myometrium
Presentation	Usually an incidental intraoperative finding; bleeding only if the vessel is injured	Abnormal uterine bleeding (intermenstrual, post-partum, post-abortion) or intraoperative hemorrhage
Doppler study	Often not detected; no turbulent high-flow pattern	Color Doppler: high-velocity, turbulent flow; CT/MR/angiography confirms nidus and shunt
Management option	Local intraoperative hemostasis (suturing, cautery, compression); no role for embolization	Uterine artery embolization (UAE) is first-line; surgery or hysterectomy if refractory
Prognosis	Generally good after hemostasis	Depends on embolization success; fertility often preserved with UAE; hysterectomy raises complication risk and loss of fertility
Recurrence	Uncommon	Recurrence risk present

A true uterine AVM is characterized by abnormal communication between the uterine arteries and veins, bypassing the capillaries, which forms the signature of such a malformation by allowing a direct high-flow connection with dilatation of vessels deep in the myometrium ¹⁶. UAVM has a high pressure gradient with high vascular flow through these central niduses. Unlike SSUV, a true AVM can often be diagnosed perioperatively and is suspected in reproductive-age women who underwent surgery or curettage; the diagnosis may be confirmed through imaging modalities such as ultrasound, MRI, or even CT when MRI results are inconclusive ¹⁷. The Yakes AVM Classification System, illustrated in Fig. 2, was developed to aid in the management and selection of therapeutic options for true AVM ^{18,19}.

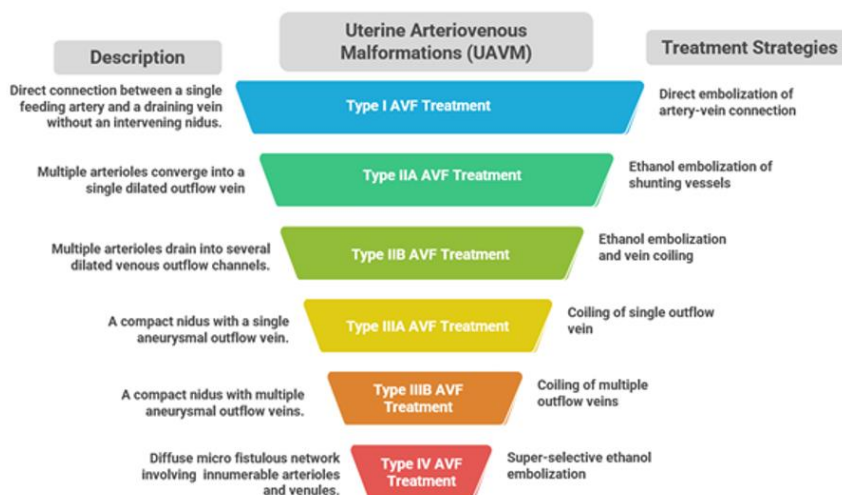


Fig. 2. Yakes AVM Classification System.

The principal clinical challenge here was intraoperative hemorrhage, a major contributor to maternal morbidity. Rapid recognition, effective hemostatic suturing, vessel ligation, and transfusion availability were key factors in preventing adverse outcomes. Postoperative monitoring with drain placement further minimized the risk of concealed bleeding²⁰.

Our case emphasizes several learning points. First, unexpected vascular abnormalities may be encountered even in otherwise low-risk cesarean deliveries. Second, careful inspection of the uterus after placental delivery is essential to identify atypical bleeding sources.

A history of prior cesarean deliveries may predispose to aberrant serosal vascular patterns, necessitating surgical vigilance. Prompt hemostatic measures and readiness for transfusion are critical for successful maternal outcomes. Although rare, SSUV expands the spectrum of non-placenta-related causes of hemorrhage at cesarean section and should be considered in the differential diagnosis when brisk intraoperative bleeding is encountered²¹.

4. CONCLUSION

This case highlights the importance of considering abnormal uterine vasculature as a potential cause of intraoperative hemorrhage during cesarean section. Although rare, such findings require prompt recognition and effective surgical management to prevent severe maternal morbidity. Since the recurrence risk is absent and a safe contraception option is available, SSUV should not impose future fertility restrictions.

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