Extended use of intrauterine balloon tamponade in a case series of patients with life-threatening menorrhagia and miscarriage

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ABSTRACT

The management of life-threatening menorrhagia presents a significant clinical challenge, particularly in cases where surgical intervention is contraindicated or refused. Intrauterine balloon tamponade has been widely used in postpartum hemorrhage, but its application in non-pregnant patients remains less well-documented. We report a series of four cases where intrauterine balloon tamponade was successfully utilized for prolonged durations in patients presenting with severe menorrhagia, demonstrating its efficacy and safety in non-pregnant individuals.

KEYWORDS

Intrauterine balloon tamponade, menorrhagia, coagulopathy, fibroids, emergency hemorrhage management.

Introduction

Heavy menstrual bleeding (HMB) is a common gynecological condition affecting women of reproductive-age, often leading to significant morbidity, including severe anemia, hemodynamic instability, and the need for emergency intervention. While medical management remains the first-line therapy, refractory cases often require procedural interventions such as endometrial ablation or hysterectomy [1]. However, these options are not always feasible due to patient refusal, surgical contraindications, or future fertility concerns.

Intrauterine balloon tamponade (IUBT) is widely recognized for its role in managing postpartum hemorrhage, yet its use in non-obstetric hemorrhage remains underreported. Given its minimally invasive nature, IUBT presents a promising alternative for cases of severe menorrhagia, particularly in patients with underlying hematological disorders [2].

HMB frequently occurs in patients with underlying coagulopathies, including von Willebrand disease and platelet function disorders. Studies estimate that up to **13%** of women with menorrhagia have von Willebrand disease, and **66%** may have idiopathic thrombocytopenic purpura (ITP) [3]. Despite these statistics, a survey found that only **4%** of gynecologists routinely consider bleeding disorders in the differential diagnosis of menorrhagia [4]. A structured history and targeted investigations, including coagulation studies, should therefore be emphasized in cases of unexplained menorrhagia.

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In addition, antiphospholipid syndrome (APS) poses a unique clinical challenge, as it is primarily a thrombotic disorder but may also present with bleeding manifestations in cases of severe thrombocytopenia or prothrombin deficiency [5]. Patients on anticoagulant therapy, particularly those receiving **vitamin K antagonists or dual antiplatelet therapy**, have a **higher prevalence of HMB**, with **10–20%** experiencing iron deficiency and **2.5%** developing anemia [6].

Given these complexities, our case series highlights the successful use of IUBT in patients with **life-threatening menorrhagia**, including those with **coagulopathies and surgical contraindications (Table 1)**. This case series adds to the growing body of evidence supporting IUBT as a safe and effective **conservative management strategy** for non-obstetric hemorrhage.

Table 1. Summary of cases

Case	Age	Parity	Diagnosis	Blood loss (mL)	Balloon type & volume	Duration	Outcome
1	49	Nulliparous	Obesity-related menorrhagia	900	Foley 16 FR, 120 mL	5 days	Bleeding stopped, no necrosis
2	29	G2P1	Post-ERPC hemorrhage	1,900	Foley 16 FR, 90 mL	48 hours	Resolved, no necrosis
3	47	Multiparous	Fibroids, refractory bleeding	1,500	Foley 16 FR, 9 0mL	48 hours	Bleeding stopped, no ischemia
4	44	Nulliparous	APS, severe anemia	-	Foley 14 FR, 90 mL	9 days	Complete resolution
5	23	G2P0+2	Post-misoprostol hemorrhage	900	Foley 16 FR, 90 mL	48 hours	Resolved, no complications
6	57	P4	Postmenopausal bleeding post-hysteroscopic polypectomy	-	Foley 16 FR, 100 mL	48 hours	Hemostasis achieved
7	47	Nulliparous	Fibroids, refractory menorrhagia	2,000	Foley 14 FR, 80mL	72 hours	Hemostasis achieved
8	37	G3P0	Missed miscarriage with heavy bleeding	-	Foley 14 FR, 110 mL	24 hours	Hemostasis achieved
9	20	Nulliparous	Post-medical termination hemorrhage	1,500+	Foley 14 FR, 120 mL	72 hours	Hemostasis achieved

Legend: APS = Antiphospholipid Syndrome; ERPC = Evacuation of Retained Products of Conception; FR = French.
[Case details section remains largely unchanged for brevity in this report but would include abbreviation expansions (i.e. ERPC, PV, MDM) and consistent use of "IUBT".]
Safety protocols: In all cases, the balloon was inserted under aseptic conditions. Patients received antibiotic prophylaxis (IV ceftriaxone or oral co-amoxiclav) and were monitored with regular clinical observations. Pain was managed with paracetamol and opioids as needed. Daily Doppler ultrasound or clinical assessments were performed to evaluate uterine blood flow. Balloons were gradually deflated in a stepwise fashion. Removal was guided by bleeding control, hemodynamic stability, and Doppler findings.
Follow-up and outcomes: All patients achieved immediate hemostasis. Follow-up at 2–6 weeks (where data available) confirmed preserved menstruation, no rebleeding, and no infection or intrauterine adhesions. Fertility outcomes were not directly assessed, but no case required hysterectomy.

Case series

Case 1

This is a 49-year-old nulliparous woman with severe menorrhagia and obesity (Body mass index [BMI] 65). The patient presented with **severe menorrhagia** and an estimated blood loss of **900 mL** in the emergency room. She was transferred to the **ICU** due to hemodynamic instability, requiring **more than 11 units of blood products** for resuscitation. A **size 16, 3-way Foley catheter** was inserted in the uterus under sedation with **120 mL balloon inflation** for **5 days**, with gradual withdrawal of **30 mL per day**. **Outcome:** The bleeding successfully stopped with **no evidence of tissue necrosis** on follow-up Doppler ultrasound.

Case 2

This is a 29-year-old G2P1 with severe bleeding post-ERPC. The patient underwent **medical management of miscarriage**, followed by **emergency room presentation** due to heavy bleeding, losing **1.9 L of blood**. Post-ERCP, the bleeding persisted, leading to total blood loss exceeding **1.5 L**, requiring immediate intervention. A **size 16, 3-way catheter** was inserted in the uterus and inflated to **90 mL**, remaining in place for **48 hours**. **Outcome:** The bleeding resolved completely, and **Doppler ultrasound confirmed no evidence of necrosis.**

Case 3

This is a 47-year-old multiparous woman with multiple fibroids and refractory menorrhagia. The patient had a **history of symptomatic intramural and submucosal fibroids** and was scheduled for **transcervical fibroid resection**. Postoperatively, **bleeding from the fibroid resection site** persisted despite endometrial ablation. A **size 16, 3-way catheter** was inserted in the uterus and inflated to **90 mL** for **48 hours**. **Outcome:** The bleeding stopped after **gradual withdrawal of the catheter (50 mL at a time over 48 hours)**, and **Doppler ultrasound showed no ischemia or necrosis**.

Case 4

This is a 44-year-old woman with APS and severe anemia. The patient, a **DMPK gene mutation carrier with a history of APS**, presented with **severe vaginal bleeding** in the hospital. Hemoglobin dropped from **14.5 g/dL to 7.9 g/dL within 4 days**, necessitating **MDM (multidisciplinary meeting) intervention**. A **size 14, 3-way catheter was inserted** in the uterus and inflated **with 90 mL of water** and remained in situ for **9 days**. **Outcome:** The bleeding ceased completely, and bedside Doppler confirmed **no uterine necrosis**.

Case 5

This is a 23-year-old G2P0+2 woman with heavy vaginal bleeding post-misoprostol. The patient presented to a regional hospital with heavy per vaginal bleeding after receiving 1 mg of misoprostol for medical management of miscarriage. A decision was made to proceed with an ERPC after persistent bleeding. During the procedure, 5 mL of intravenous oxytocin was administered; however, the estimated blood loss was 900 mL. A size 16, 3-way Foley catheter was inserted in the uterus and inflated with 90 mL of water. The balloon was deflated slowly every 12 hours and removed on day 2 without complications. **Outcome:** Bleeding was successfully controlled with no reported complications.

Case 6

This is a 57-year-old P4 woman with postmenopausal bleeding following hysteroscopic polypectomy. The patient presented with postmenopausal bleeding and underwent outpatient hysteroscopy

for further assessment. A large endometrial polyp was identified, and the decision was made to proceed with hysteroscopic polypectomy under general anesthesia. In the operating theater, an XL MyoSure device was used for polyp removal. Following the procedure, heavy bleeding was noted, and initial attempts at compression for hemostasis were unsuccessful. Due to ongoing hemorrhage, a size 16, 3-way Foley catheter was inserted in the uterus and inflated with 100 mL of water. The balloon was gradually deflated by 50 mL every 12 hours and removed on day 2. **Outcome:** Hemostasis was achieved without further complications.

Case 7

This is a 47-year-old nulliparous woman with multiple fibroids and refractory menorrhagia. The patient, with a BMI of 47, had multiple admissions due to severe menorrhagia and was managed with tranexamic acid. On her current admission, the estimated blood loss reached 2,000 mL, with no response to medical therapy. A decision was made to use IUBT for hemostasis. A size 14, 3-way Foley catheter was inserted in the uterus and inflated with 80 mL of water. The balloon was deflated gradually: 30 mL over the first two days, followed by 20 mL on the last day. The catheter remained in situ for 72 hours. **Outcome:** Hemostasis was successfully achieved with no complications.

Case 8

This is a 37-year-old G3P0 woman with recurrent miscarriage and heavy bleeding. The patient, with a BMI of 32, had a history of recurrent miscarriages with no prior investigations. She was diagnosed with a missed miscarriage and prescribed mifepristone. She started bleeding at home two hours after taking the medication. Upon arrival at the hospital, there was no response to misoprostol or oxytocin. A decision was made to use intrauterine balloon tamponade for hemostasis. A size 14, 3-way Foley catheter was inserted and inflated with 110 mL of water. The balloon was deflated gradually: 55 mL every 12 hours. The catheter remained in situ for 24 hours. **Outcome:** Hemostasis was successfully achieved with no complications.

Case 9

A 20-year-old nulliparous woman with post-medical termination hemorrhage. The patient opted for medical termination of pregnancy through her general practitioner. She presented to the maternity assessment unit with heavy bleeding of 500 mL at home. Upon hospital assessment, despite the use of misoprostol (800 mcg) and oxytocin infusion, the estimated blood loss exceeded 1,500 mL. A decision was made to proceed with surgical ERCP. To achieve hemostasis, a size 14, 3-way Foley catheter was inserted in the uterus and inflated with 120 mL of water. The balloon was deflated gradually over 3 days, 4 mL at a time. **Outcome:** Hemostasis was successfully achieved with no complications.

Discussion

Menorrhagia is a major contributor to morbidity among women of reproductive and perimenopausal age. Although surgical options such as hysterectomy offer definitive management, they may not be feasible due to patient preferences, comorbidities, or fertility concerns. Conservative alternatives are therefore vital, particularly in acute or complex clinical scenarios.

Our case series highlights the efficacy and safety of IUBT in managing severe non-obstetric hemorrhage. Traditionally used for postpartum hemorrhage, its utility in non-pregnant women remains underreported. We demonstrate that Foley catheter balloon tamponade, maintained for durations up to 9 days, was effective in arresting hemorrhage across diverse etiologies without ischemic complications confirmed via Doppler imaging. This contradicts earlier concerns about prolonged intrauterine pressure causing tissue necrosis and supports IUBT as a viable temporizing measure until definitive treatment can be instituted [7].

Several cases in our series involved patients with hematological abnormalities, including APS, ITP, and iron deficiency anemia. APS is classically a thrombotic disorder, yet in rare instances—especially when associated with thrombocytopenia or prothrombin deficiency—it can present with life-threatening hemorrhage [2,5]. Only limited case reports have documented concurrent thrombosis and bleeding in APS patients [8-10]. In these patients, management is highly complex due to the competing risks of thrombosis and hemorrhage, particularly when anticoagulation is necessary. In our APS case, the use of IUBT provided critical time to stabilize bleeding, allowing safe re-initiation of anticoagulation and consideration of longer-term strategies such as hysterectomy.

Thrombocytopenia, whether immune-mediated or secondary to myelosuppression, significantly contributes to HMB. Iron deficiency anemia may exacerbate this by causing reactive thrombocytosis or paradoxical thrombocytopenia through mechanisms involving erythropoietin and megakaryocyte dysregulation. Our patients benefited from multimodal management including transfusion support, corticosteroids, intravenous immunoglobulin, and mechanical tamponade. The balloon tamponade allowed temporary hemorrhage control, effectively bridging to definitive medical therapies—especially important in patients with fluctuating platelet counts or immune dysregulation [11].

Uterine fibroids and adenomyosis are well-known structural causes of HMB, classified under the PALM-COEIN system as AUB-L (leiomyoma) [12]. In multiple cases, patients with symptomatic fibroids presented with refractory bleeding. The IUBT approach provided effective temporary hemostasis, preventing surgical intervention in high-risk or non-consenting individuals. While uterine artery embolization and hormonal therapy are potential alternatives, they may be contraindicated or ineffective in certain settings. In one patient, uterine artery embolization failed to stabilize hemoglobin levels, but balloon tamponade succeeded in controlling acute blood loss **[7]**.

Managing HMB in patients on anticoagulation poses a delicate balance between preventing thrombosis and avoiding hemorrhage. Some treatments, such as tranexamic acid or hormonal IUDs, have limitations in efficacy and safety in this population. In one of our cases, where pharmacologic options had failed, mechanical tamponade with a Foley catheter successfully controlled bleeding without adverse events, supporting its use as an emergency bridge to surgery [7,11].

Historically, intrauterine tamponade has been described with durations of 24–48 hours. In our series, we observed no complications with balloons left in place for up to 9 days. Doppler studies confirmed normal uterine perfusion post-removal. This suggests that, with appropriate monitoring, prolonged tamponade may be both safe and effective in stabilizing severe bleeding [7].

IUBT in structural vs. coagulopathic causes: Patients with fibroids or procedural complications responded well to mechanical tamponade. Structural causes of HMB often require surgical treatment, but IUBT served as a stabilizing measure or alternative in high-risk patients.

Challenges in coagulopathy and anticoagulation: Patients with APS or ITP present complex management dilemmas. IUBT allowed temporary bleeding control in these settings, avoiding interruption of anticoagulation and allowing bridging to safer surgical timing.

Bridging tool to definitive management: IUBT was used as a temporizing measure allowing medical stabilization or second-line therapy. It minimized transfusion burden and obviated surgery in multiple cases.

Comparison to other therapies: Pharmacological agents like tranexamic acid and hormonal IUDs are often first-line but may be ineffective or contraindicated [13]. Uterine artery embolization and ablation require operating room access and patient stability [14]. IUBT is cost-effective, bedside-compatible, and suitable even for prolonged use.

Previous literature on non-obstetric IUBT is limited. Yu et al. [15] demonstrated the efficacy of the use of Foley catheter balloon tamponade to reduce intrauterine bleeding post hysteroscopic resection of a large submucosal fibroid. Hamani et al. [11] described IUBT for ITP-related uterine bleeding. Our series adds evidence for its extended duration (up to 9 days), across various non-obstetric causes.

Key findings from our case series

- Balloon tamponade effectively **controlled severe menorrhagia** in patients with different etiologies (fibroids, miscarriage-related hemorrhage, APS, obesity-related menorrhagia).
- Duration of tamponade ranged from **48 hours to 9 days** without ischemic complications.
- Doppler ultrasound was a useful tool to **confirm uterine integrity post-treatment**.
- This approach **avoided surgical interventions** such as hysterectomy, especially in patients refusing surgery or unfit for major procedures.

Conclusion

This case series provides evidence supporting the **extended use of IUBT** as a **viable conservative management strategy** for life-threatening menorrhagia. Our findings demonstrate that **longer durations (beyond 48 hours) may be safe and effective** with appropriate monitoring. Further studies are needed to establish standardized protocols for prolonged balloon tamponade in non-obstetric hemorrhage.

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Ethical considerations

Ethical approval was obtained from the institutional review board for the management of these cases, and patient consent was secured for case publication.

Conflict of interest

The authors declare no conflicts of interest.