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Couvelaire Crisis: A Case of Concealed Placental Abruption with Multisystem Obstetric Emergency

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Abstract

Placental abruption is a serious obstetric complication that can lead to maternal hemorrhage, fetal compromise, and, rarely, Couvelaire uterus—characterized by blood extravasation into the myometrium and serosa. We report a case of a 31-year-old primigravida at 35 weeks of gestation presenting with lower abdominal discomfort and absent fetal movements. Initial examination revealed a tense uterus with no vaginal bleeding, and bedside ultrasound confirmed intrauterine fetal demise with a large retroplacental clot. Despite stable vitals and a favorable cervix, her condition progressed with uterine atony, worsening pain, and laboratory evidence of disseminated intravascular coagulation (DIC). Emergency cesarean delivery revealed a Couvelaire uterus with massive retroplacental hemorrhage. A stepwise conservative surgical approach was employed, including bilateral uterine artery ligation, B-Lynch compression suture, and Bakri balloon tamponade, alongside sequential medical management and transfusion of blood products. Estimated blood loss was 4000 mL. Hemostasis was achieved, avoiding hysterectomy, and the patient recovered fully under multidisciplinary care. This case highlights the challenges in diagnosing concealed placental abruption and demonstrates the effectiveness of combined conservative surgical techniques—the "uterine sandwich"—in managing severe hemorrhage and preserving fertility, even in the context of DIC. Early recognition, surgical preparedness, and coordinated multidisciplinary intervention are critical to improving maternal outcomes in life-threatening obstetric emergencies.

Introduction

Placental abruption is a serious obstetric complication characterized by premature separation of the placenta from the uterine wall, leading to hemorrhage and fetal compromise. While the classic presentation includes vaginal bleeding, abdominal pain, and uterine tenderness, concealed abruptions may manifest more subtly, delaying diagnosis and increasing risks to both mother and fetus [1].

A rare complication in a life-threatening case of severe placental abruption, is the development of a Couvelaire uterus, also known as uteroplacental apoplexy. This condition occurs when bleeding infiltrates through the decidua into the myometrium and serosa, causing a characteristic bluish-purple ecchymotic discoloration of the uterine wall. The uterus may become tense and "woody," complicating labor and increasing the risk of hemorrhage and disseminated intravascular coagulation [2].

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Management of the Couvelaire uterus is challenging due to the potential for massive hemorrhage and coagulopathy. Historically, hysterectomy was frequently performed to control bleeding; however, advances in conservative surgical techniques, including uterine artery ligation, B-Lynch compression sutures, and intrauterine balloon tamponade (e.g., Bakri balloon), now allow for effective hemostasis while preserving uterine function [3]. Early multidisciplinary intervention is essential to improve maternal outcomes and reduce morbidity.

This case report highlights a primigravida presenting with concealed placental abruption complicated by Couvelaire uterus and disseminated intravascular coagulation, managed successfully with multimodal surgical techniques to preserve the uterus despite massive hemorrhage. It underscores the importance of vigilance for subtle presentations of abruption and the potential for conservative uterine-sparing interventions even in severe cases.

Case presentation

A 31-year-old primigravida, at 35 of weeks gestation presented to the emergency department with lower abdominal discomfort and absent fetal movements. She had no medical comorbidities or identifiable risk factors in this pregnancy.

Her Blood pressure on presentation to emergency was 126/85 and pulse 86 beats per minute. Examination revealed a tense uterus and absence of fetal heart tones. She was 1 cm dilated with early effacement and no active bleeding. Bedside ultrasound confirmed intrauterine fetal demise and a large retroplacental clot of 11cm suggestive of abruption.

Immediate admission was done to the labor and delivery unit and proceeded with a plan of short trial of vaginal delivery as it was intrauterine fetal demise with favorable cervix, but with a low threshold of cesarean in case of any maternal compromise or failure to progress. Initial coagulation profile and platelets were normal in the background of mild anemia (Table 1).

Table 1: Coagulation profile of the patient.

Coagulation profile	Pre-Operation	During Operation	Post Operation	Reference levels
Prothrombin Time	11.7 seconds	18.4 seconds	11.4 seconds	Normal 11–15 s; < 3s above control
INR	1.05	1.67	1.03	<1.5
aPTT	26.5 seconds	34.8 seconds	27.4 seconds	25 - 35 seconds
Hb	10.2 g/dl	3.5 g/dL	10.7 g/dL	8 g/dL
Platelets	164×10^9 $10^3/\mu L$	$38\times10^3/\mu L$	$189\times10^3/\mu L$	$\geq 50\times10^9/L$

Artificial rupture of membranes done which showed clear liquor going with diagnosis of concealed abruption. A trial of vaginal delivery was initiated. However, symptoms worsened with non-progression, hard uterus, persistent vomiting, worsening pain, tachycardia, and blood-stained urine, raising suspicion for worsening abruption and Disseminated Intravascular Coagulation. An emergency cesarean section was performed.

Intraoperatively, approximately 700 mL of hemoperitoneum was encountered upon entry into the peritoneal cavity. A dead male fetus 2.3 kg was delivered and about 700 mL of retroplacental clots were removed. Both fallopian tubes were edematous and congested, with active bleeding observed from the fimbrial ends, and both ovaries normal. The uterus exhibited classic features of a Couvelaire uterus (Figure 1), with bluish-purple ecchymosis extending over the fundus and serosal surfaces, indicative of blood extravasation into the myometrium and serosa. Uterine tone was poor with intermittent atony, and the lower uterine segment appeared thickened and edematous.

Due to ongoing hemorrhage and poor uterine tone, a stepwise surgical approach was adopted. Bilateral uterine artery ligation was performed, followed by a B-Lynch (Figure 2) compression suture, which achieved partial hemostasis. Uterus continued to be atonic despite uterine message and sequential medical management and hence a Bakri balloon was then inserted. By this time the patient has already received Pabal (carbetocin), methyl ergometrine and carboprost along with oxytocin on flow in a sequential manner along with blood and blood products replacement.Total estimated blood loss was approximately 4000 mL. On table coagulation profile deranged with Hb of 3.5 and platelet 38000. The patient received on the table, 2 units Packed red blood cells, 4 Fresh Frozen Plasma, one pool platelet (6 units). After all the above measures the uterus was getting contracted and the ongoing bleeding reduced.

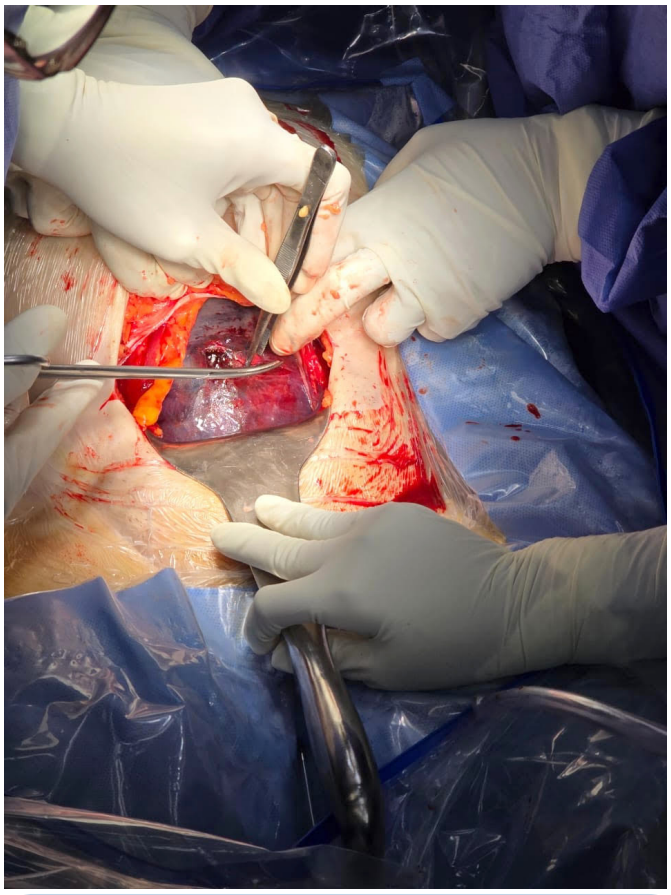

Figure 1: Couvelaire uterus with ecchymotic discoloration of the myometrium and serosa.

Abdomen was closed with intrauterine drain and transferred to the intensive care unit for ongoing resuscitation and management of disseminated intravascular coagulation.

She received 4 more units of packed Red Blood Cells and 1 pool cryoprecipitate in the intensive care unit. In total the patient received 6 units of packed Red Blood Cells, 6 units platelets, 6 units cryoprecipitate and 6 Fresh Frozen Plasma.

The patient recovered well under care of a multidisciplinary team including obstetricians, anaesthesiologist, critical care physician and internal medicine specialist. She stayed in the intensive care unit for two days and in the private room for two more days and was discharged under stable conditions.

Discussion

In our case, a previously healthy primigravida with no identifiable risk factors developed a concealed abruption that rapidly progressed to Couvelaire uterus, intrauterine fetal demise, and disseminated intravascular coagulation. While many abruptions present with classic symptoms such as vaginal bleeding, uterine tenderness, and abnormal fetal heart tracing, concealed abruptions may manifest more subtly, delaying diagnosis. This was evident in our patient, whose initial presentation was mild and hemodynamically stable, progressing to a catastrophic event. In a large cohort study by Ananth et al. (1999), placental abruption was associated with a significantly increased risk of intrauterine fetal death, especially in cases of concealed bleeding, highlighting the high perinatal mortality and severe complications such as Couvelaire uterus in a subset of patients [5].

A study by Georgiou et al. (2012) analyzed 24 cases of severe postpartum hemorrhage unresponsive to medical treatment. The combination of intrauterine balloon tamponade (Bakri balloon) and B-Lynch compression suture, termed the "uterine sandwich," was employed. In this cohort, 90% of patients achieved successful hemostasis without the need for hysterectomy, highlighting the efficacy of this combined approach in managing severe hemorrhage [6]. Our patient similarly underwent sequential uterine artery ligation, B-Lynch suture, and Bakri balloon placement, successfully avoiding hysterectomy despite a total blood loss of 4 liters in the background of disseminated intravascular coagulation.

Several global reports support the effectiveness of conservative surgical management combining B-Lynch sutures and Bakri balloon tamponade for controlling severe obstetric hemorrhage, including in cases of placental abruption. A Japanese case of abruption with 4 L blood loss, highlight the success of this "uterine sandwich" approach in avoiding hysterectomy, even in resource-limited settings. These findings reinforce the viability of stepwise uterine-sparing techniques in managing Couvelaire uterus and massive bleeding [7]. These global reports emphasize that early recognition, surgical preparedness, and multidisciplinary management are critical to reduce morbidity and mortality in such high-risk obstetric emergencies.

Conclusion

Although the patient initially presented with stable vitals and mild symptoms, her condition rapidly progressed to a Couvelaire uterus complicated by disseminated intravascular coagulation, a severe complication involving bleeding into the uterine muscle and serosa.

Effective management required a multidisciplinary approach utilizing multiple conservative surgical techniques to control massive hemorrhage. Bilateral uterine artery ligation, B-Lynch compression sutures, and Bakri balloon tamponade were employed sequentially, achieving hemostasis and successfully preserving the uterus despite an estimated blood loss of 4000 mL. Prompt correction of disseminated intravascular coagulation with blood and blood products was done with active involvement of the bloodbank team. Avoiding hysterectomy in this critical setting helped maintain the patient's future fertility and reduced surgical morbidity.

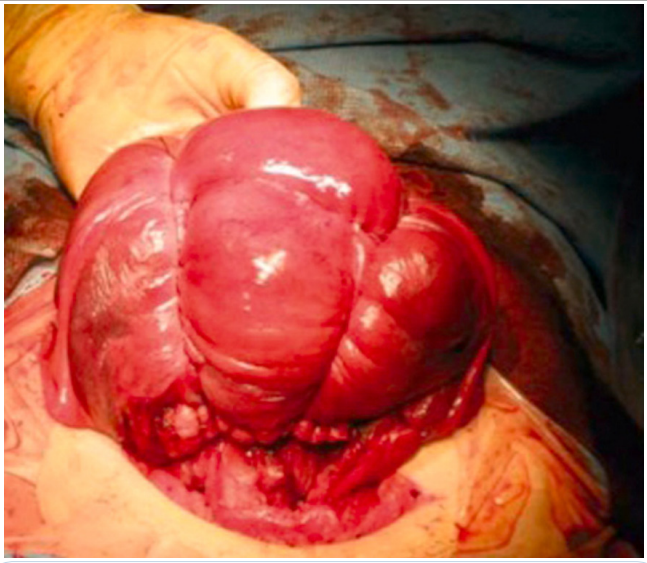

Figure 2: B-Lynch compression suture [4].

This case supports existing evidence favoring uterus-sparing interventions in managing severe obstetric hemorrhage related to placental abruption and Couvelaire uterus. Early diagnosis, surgical preparedness, and coordinated care are essential to improve maternal outcomes. These insights emphasize the need to include conservative surgical options in clinical guidelines for high-risk obstetric emergencies.

Contributors

Adhya Miriam Tom contributed significantly to the acquisition and interpretation of clinical and investigational data, conducted a comprehensive literature review, and was primarily responsible for drafting the manuscript. In addition, Adhya, Sofia, Shameema and Amal critically revised the article for intellectual content, ensuring clarity, coherence, and scientific accuracy.

Shameema and Amal contributed to the direct care and management of the patient, played a central role in the conception and design of the case report, and provided critical revisions to the manuscript, enhancing its academic rigor and clinical relevance.

All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the manuscript are appropriately addressed.

Author declarations

Patient consent

Written informed consent was obtained from the patient for publication of the case report and accompanying images.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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