Case Report

The unseen complication: Rectus sheath hematoma after cesarean section

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ABSTRACT

This case report details a patient who underwent a lower segment cesarean section at 37 weeks and 3 days of gestation, complicated by a rectus sheath hematoma (RSH). The early post-operative course was uneventful, and she was discharged on post-operative day (POD) 5. On POD 11, she presented with profuse blood-stained discharge from the surgical wound. Given the concern for intra-abdominal hemorrhage in the setting of an acute abdomen, exploratory laparotomy was performed. A significant amount of blood was removed from between the rectus sheath and rectus abdominis muscle. RSHs are rare complications that can cause substantial post-operative hemorrhage. Prompt recognition and management are crucial to prevent significant morbidity and mortality. Algorithms exist to guide treatment and standardize patient care.

Key words: Abdominal wall hematoma, Cesarean section, Exploratory laparotomy, Post-operative hemorrhage, Rectus sheath hematoma

Rectus sheath hematoma (RSH) is a rare condition that often follows abdominal trauma or anticoagulation. Although it accounts for only a small proportion of cases presenting with acute abdomen, delayed diagnosis may lead to significant complications, including severe anemia, hypovolemic shock, and hemoperitoneum [1,2]. This condition is rare in the post-operative period following lower segment cesarean section (LSCS). It can cause significant postpartum hemorrhage, and RSH may occur spontaneously or as a result of damage to the inferior epigastric vasculature during surgery [3]. The anatomy of the anterior abdominal wall musculature itself makes it susceptible to vascular injury. Weak perforating vessels of the inferior epigastric arteries and veins loosely attach to the rectus abdominis muscle [4]. Although RSH accounts for approximately 1–2% of cases of acute abdominal pain, postpartum RSH following cesarean section remains rare and is described predominantly in isolated case reports and small case series [2]. Most published cases present within the 1st few post-operative days (POD) with severe abdominal pain, abdominal distension, or a rapid decline in hemoglobin concentration. Delayed presentation beyond the 1st post-operative week is distinctly uncommon.

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We report a rare case of a large RSH presenting on POD 11 as profuse blood-stained wound discharge following an initially uncomplicated repeat cesarean section.

CASE REPORT

A 32-year-old G2P1L1 unbooked patient presented to the outpatient department with a diagnosis of G2P1L1 at 37 weeks and 3 days of gestation, with a previous LSCS. She was planned for elective LSCS on maternal request. The patient had no history of pre-eclampsia, trauma, chronic cough, constipation, or anticoagulant use.

The abdomen was opened through a Pfannenstiel skin incision. Intraoperative findings revealed 2–3 seedlings of fibroids. Proper hemostasis was secured, and the abdomen was closed in layers. No drain was used. The duration of surgery was approximately 45–50 min.

On POD 1 of LSCS, the patient experienced severe lower abdominal pain. Clinical examination revealed a soft, non-tender abdomen with a well-contracted uterus, and her vital signs remained stable (pulse: 76 beats/min, blood pressure: 124/76 mmHg, respiratory rate: 17 breaths/min, temperature: 98.1°F). Her symptoms improved following administration of analgesics. On POD 2 of LSCS, she developed a low-grade fever (100°F) without chills or rigors, which

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resolved with symptomatic treatment. There were no clinical features suggestive of wound infection or intra-abdominal sepsis. Laboratory investigations performed on POD 3 demonstrated a hemoglobin concentration of 9.4 g/dL. Intravenous ferric carboxymaltose (1 g) was administered for post-operative anemia. The remainder of her post-operative recovery was uneventful, and she was discharged in stable condition on POD 5 after satisfactory wound inspection.

The patient returned for routine post-operative follow-up on POD 10 for suture removal. Alternate sutures were removed initially, followed by complete suture removal under aseptic precautions. Mild induration was noted along the incision, without wound discharge, active bleeding, or wound dehiscence. During this visit, she reported experiencing three to four intermittent febrile episodes associated with chills and rigors after discharge. One day later (POD 11), she presented to the emergency department with profuse blood-stained discharge from the surgical wound, accompanied by lower abdominal discomfort. She denied any history of trauma, strenuous physical activity, excessive coughing, constipation, or anticoagulant use following discharge.

The patient was admitted for evaluation, and primary resuscitation was initiated. Her vital signs were stable (pulse: 84 beats/min, blood pressure: 118/74 mmHg, respiratory rate: 18 breaths/min, temperature: 98.5°F). Grade 2 pallor was present, and systemic examination was within normal limits. On per-abdominal examination, the dressing was completely soaked, and her clothes were stained with altered blood. After the soaked dressing was removed, induration was noted. On pressure over the stitch line, profuse blood discharge emerged from the left side of the stitch line. Clinical evaluation raised suspicion of post-operative hemorrhage with a possible intra-abdominal collection.

Based on the patient's symptoms and clinical findings, a provisional diagnosis of intra-abdominal hemorrhage with acute abdomen was considered. Hemodynamic assessment and laboratory investigations suggested ongoing blood loss. Ultrasonography revealed a RSH measuring 96 × 88 × 68 mm (volume 309 cc). Due to the severity of symptoms and suspicion of a concealed hematoma, emergency exploratory laparotomy was planned for definitive diagnosis and management. Serial ultrasound (USG) done before and after exploratory laparotomy is shown in Figs. 1 and 2.

An immediate decision to perform exploratory laparotomy was made, and 500 mL of blood clot between the rectus sheath and muscle was removed. No active bleeder was found. The uterus and bladder were normal. A second opinion from the surgeon was obtained, and the abdomen was closed after placement of an intra-abdominal drain. Two units of packed red blood cells were transfused in the post-operative period. Intravenous antibiotics were administered after LSCS (ceftriaxone 1 g IV every 12 h and metronidazole 400 mg IV every 8 h) and after exploratory laparotomy (piperacillin-tazobactam 4.5 g IV every 12 h and metronidazole 400 mg IV every 8 h). The drain was removed on day 8. The patient was discharged in stable condition on POD 10. Serial hematological and laboratory investigations during hospitalisation are shown in Table 1. Clinical timeline of the patient is shown in Fig. 3.

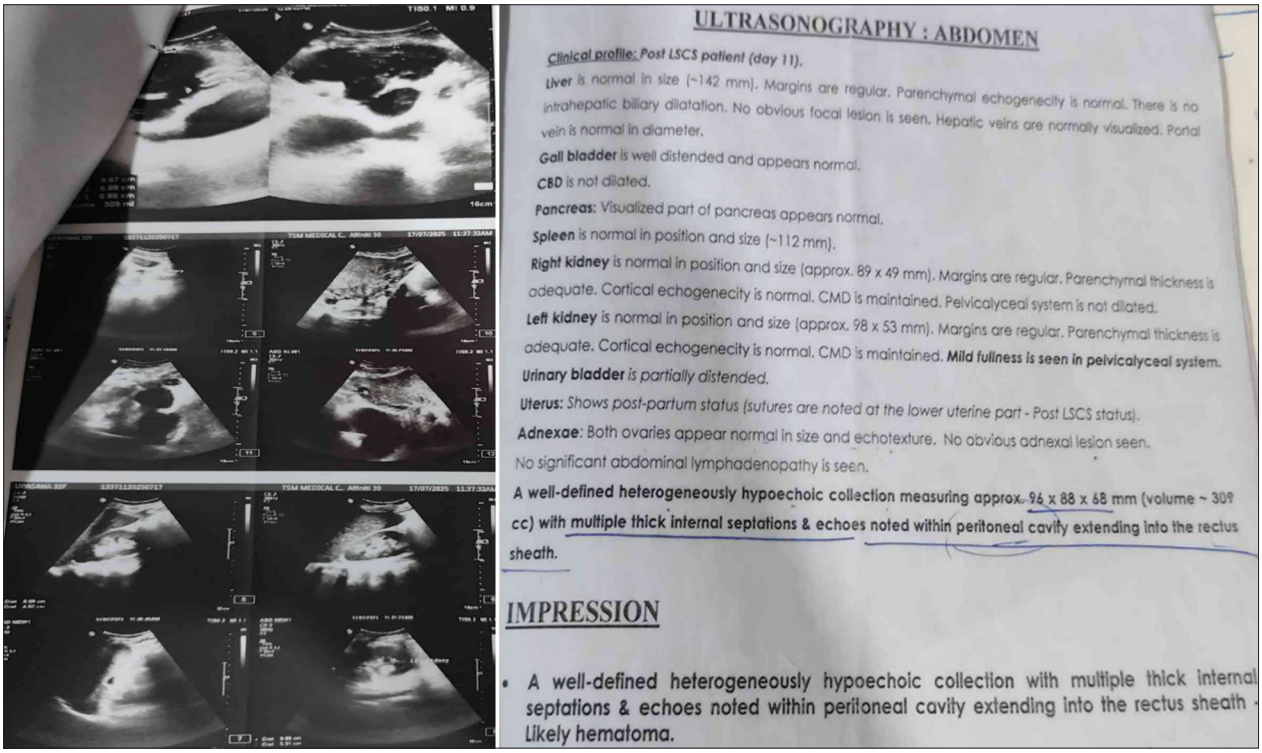
DISCUSSION

RSH is an uncommon but potentially life-threatening complication that may occur following abdominal surgery, trauma, anticoagulant therapy, or spontaneous rupture of the epigastric vessels [2]. In obstetric practice, cesarean section represents an important predisposing factor because surgical dissection of the anterior abdominal wall places the inferior epigastric vessels and their perforating branches at risk of injury. These vessels course along the posterior aspect of the rectus abdominis muscle before entering the rectus sheath, making them particularly vulnerable during lower abdominal incisions. Furthermore, below the arcuate line, the absence of the posterior rectus sheath allows blood to dissect freely between the rectus muscle and the transversalis fascia, enabling substantial hematoma formation before overt clinical manifestations become apparent [2,4].

The non-specific nature of the presenting symptoms makes careful differential diagnosis essential. Following cesarean section, delayed wound bleeding may result from wound hematoma, seroma, surgical site infection, rectus muscle abscess, pelvic hematoma, uterine scar dehiscence, secondary postpartum hemorrhage, retained products of conception, or intra-abdominal hemorrhage [2]. In our patient, persistent wound bleeding associated with progressive anemia initially raised concern for concealed post-operative hemorrhage. No active bleeding vessel was identified during surgical exploration, suggesting that hemorrhage had either ceased spontaneously or originated from a small arterial or venous branch that became tamponaded before re-exploration.

Despite extensive training in the diagnosis and management of common intra-abdominal surgical emergencies, there remains a notable gap in awareness regarding abdominal wall pathologies such as RSH, which can closely mimic an acute abdomen and lead to diagnostic confusion. Although RSH is generally a benign and self-limiting condition, it can occasionally be life-threatening, with an overall mortality rate reported to be around 4%.

Manning *et al*. reported a case series of two patients who underwent cesarean section complicated by RSH. The hematoma did not resolve immediately after exploratory laparotomy. Both patients developed symptomatic anemia on POD 1, with a sharp drop in hemoglobin and severe abdominal pain and distension on physical examination. Exploratory laparotomy was performed on POD 2 after confirming the hematoma. Both patients were hypertensive. In contrast, our patient



ULTRASONOGRAPHY : ABDOMEN

Clinical profile: Post LSCS patient (day 11).

Liver is normal in size (~142 mm). Margins are regular. Parenchymal echogenecity is normal. There is no intrahepatic biliary dilatation. No obvious focal lesion is seen. Hepatic veins are normally visualized. Portal vein is normal in diameter.

Gall bladder is well distended and appears normal.

CBD is not dilated.

Pancreas: Visualized part of pancreas appears normal.

Spleen is normal in position and size (~112 mm).

Right kidney is normal in position and size (approx. 89 x 49 mm). Margins are regular. Parenchymal thickness is adequate. Cortical echogenecity is normal. CMD is maintained. Pelvicalyceal system is not dilated.

Left kidney is normal in position and size (approx. 98 x 53 mm). Margins are regular. Parenchymal thickness is adequate. Cortical echogenecity is normal. CMD is maintained. Mild fullness is seen in pelvicalyceal system.

Urinary bladder is partially distended.

Uterus: Shows post-partum status (sutures are noted at the lower uterine part - Post LSCS status).

Adnexae: Both ovaries appear normal in size and echotexture. No obvious adnexal lesion seen.

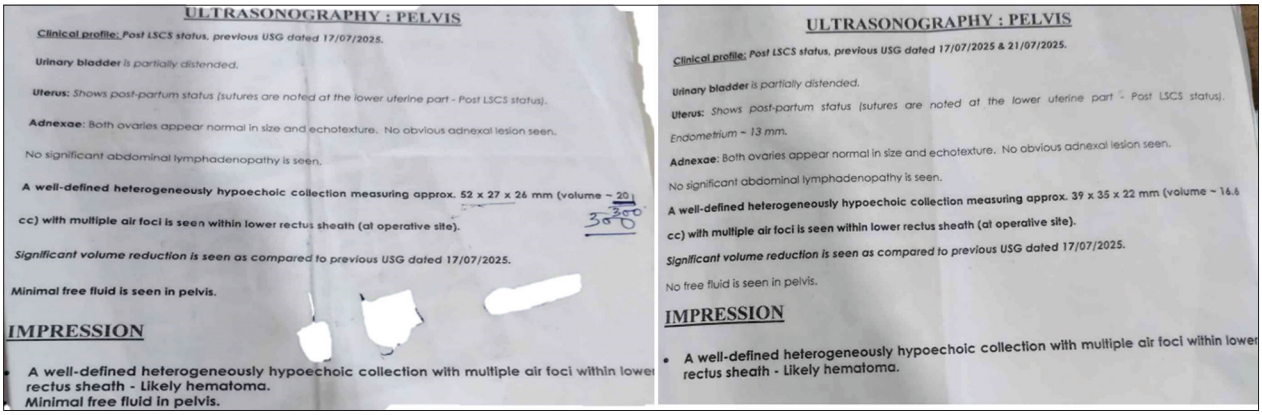
No significant abdominal lymphadenopathy is seen.

A well-defined heterogeneously hypoechoic collection measuring approx. 96 x 88 x 68 mm (volume ~ 309 cc) with multiple thick internal septations & echoes noted within peritoneal cavity extending into the rectus sheath.

IMPRESSION

- A well-defined heterogeneously hypoechoic collection with multiple thick internal septations & echoes noted within peritoneal cavity extending into the rectus sheath - Likely hematoma.

Figure 1: Ultrasound before exploratory laparotomy



ULTRASONOGRAPHY : PELVIS

Clinical profile: Post LSCS status, previous USG dated 17/07/2025.

Urinary bladder is partially distended.

Uterus: Shows post-partum status (sutures are noted at the lower uterine part - Post LSCS status).

Adnexae: Both ovaries appear normal in size and echotexture. No obvious adnexal lesion seen.

No significant abdominal lymphadenopathy is seen.

A well-defined heterogeneously hypoechoic collection measuring approx. 52 x 27 x 26 mm (volume ~ 20 cc) with multiple air foci is seen within lower rectus sheath (at operative site).

Significant volume reduction is seen as compared to previous USG dated 17/07/2025.

Minimal free fluid is seen in pelvis.

IMPRESSION

- A well-defined heterogeneously hypoechoic collection with multiple air foci within lower rectus sheath - Likely hematoma.
- Minimal free fluid in pelvis.

ULTRASONOGRAPHY : PELVIS

Clinical profile: Post LSCS status, previous USG dated 17/07/2025 & 21/07/2025.

Urinary bladder is partially distended.

Uterus: Shows post-partum status (sutures are noted at the lower uterine part - Post LSCS status).

Endometrium ~ 13 mm.

Adnexae: Both ovaries appear normal in size and echotexture. No obvious adnexal lesion seen.

No significant abdominal lymphadenopathy is seen.

A well-defined heterogeneously hypoechoic collection measuring approx. 39 x 35 x 22 mm (volume ~ 16.6 cc) with multiple air foci is seen within lower rectus sheath (at operative site).

Significant volume reduction is seen as compared to previous USG dated 17/07/2025.

No free fluid is seen in pelvis.

IMPRESSION

- A well-defined heterogeneously hypoechoic collection with multiple air foci within lower rectus sheath - Likely hematoma.

Figure 2: Serial ultrasound done after exploratory laparotomy

Table 1: Serial hematological and laboratory investigations during hospitalisation

Time point	Hemoglobin (g/dL)	Total leukocyte count (mm^3)	Platelet count (×10^5/mm^3)	PT (s)	INR	Urine routine examination
Pre-operative	11.8	8,800	1.99	11.5	0.81	Normal
Post-operative day 3 (After LSCS)	9.4	11,900	1.92	–	–	8–10 pus cells/HPF, 7–8 RBCs/HPF
Post-operative day 11 (Presentation)	8.2	11,800	1.85	12.6	0.90	Not performed
Post-laparotomy day 3	9.4	13,700	2.35	–	–	4–5 pus cells/HPF, 40–50 RBCs/HPF, budding yeast present
Post-laparotomy day 5	10.2	6,200	1.68	–	–	Not performed
Post-laparotomy day 8	11.0	6,000	1.70	–	–	Not performed

PT: Prothrombin time, INR: International normalized ratio, LSCS: Lower segment cesarean section, RBC: Red blood cells, HPF: High-power field

was normotensive and experienced no significant hemoglobin drop. Furthermore, her pain subsided with medication [1]. Kamboj *et al*. reported a similar case in which a patient underwent LSCS due to pre-eclampsia. She complained of fever, discharge from the stitch line, and difficulty passing stool and gas. A diagnosis of fever, anemia, small bowel obstruction, and thrombocytopenia was made. On the 13th POD, a swelling measuring approximately 5 × 6 cm developed in the right lumbar region. Ultrasound revealed a hematoma in the rectus sheath. Her hemoglobin level was 6.5 g/dL. Exploratory laparotomy was performed, and an actively bleeding right inferior epigastric artery was found and ligated. The hematoma was also evacuated. In contrast, in our case,

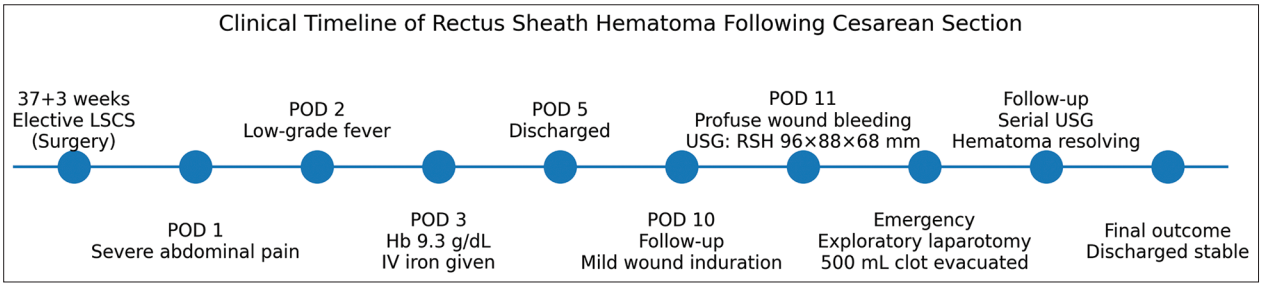


Figure 3: Clinical timeline of the patient

no actively bleeding vessel was localized [5]. Agrawal *et al*. reported a series of postpartum RSHs occurring after cesarean section in which patients presented with abdominal pain and distension during the early post-operative period. Two patients were successfully treated conservatively, while one required surgical intervention due to hemoperitoneum and clinical deterioration [6]. Similarly, Hirata *et al*. described a case of RSH following cesarean section in a patient receiving anticoagulation therapy for post-operative pulmonary embolism. The hematoma progressively enlarged during anticoagulation therapy but stabilised after temporary discontinuation of heparin, demonstrating the importance of anticoagulation as a significant risk factor [7]. Sufficool *et al*. reported a case of a large RSH developing 1 month after cesarean delivery that subsequently became infected and progressed to necrotising fasciitis of the abdominal wall. Surgical exploration and debridement were required. This case highlights the potential for delayed presentation and secondary complications when diagnosis is delayed [8]. Another important report by Elmoghrabi *et al*. described spontaneous intraperitoneal rupture of a postpartum RSH following vaginal delivery. The patient initially presented with abdominal pain and was managed conservatively; however, she rapidly deteriorated and required emergency laparoscopic evacuation of approximately two liters of intraperitoneal blood [3].

CONCLUSION

RSH is a rare but important complication following cesarean section. Because the clinical presentation may mimic other post-operative conditions, delayed diagnosis is possible. Clinicians should maintain a high index of suspicion in patients presenting with unexplained abdominal pain, anemia, wound induration, or unusual wound bleeding following cesarean delivery. Early post-operative assessment, careful wound examination, and prompt ultrasonographic evaluation of the abdominal wall can facilitate timely diagnosis and prevent progression to large hematoma formation requiring emergency surgical intervention.

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