

Rectus Sheath Hematoma Causing Intraperitoneal Hemorrhage: An Atypical Emergency Diagnosis

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Abstract:

Rectus sheath hematoma (RSH) is a rare but notable cause of abdominal pain, commonly associated with trauma or anticoagulation therapy. It occurs due to the rupture of a branch of the inferior epigastric artery at its attachment to the rectus abdominis muscle, often without effective hemostasis. Diagnosing RSH can be challenging, as it frequently mimics other intra-abdominal conditions. Preoperative identification is uncommon, with most cases diagnosed intraoperatively, and only a limited number of cases reported in the literature. Here, we present the case of a 57-year-old male who developed RSH following blunt trauma to the left lower abdomen caused by a motorbike rim during repair work. The patient reported left lower paraumbilical pain, and intraperitoneal bleeding was confirmed via clinical evaluation and CT imaging. This case highlights the diagnostic complexities of RSH in acute abdominal presentations and emphasizes the importance of thorough examination and imaging for timely diagnosis and management.

Key words: rectus sheath hematoma; trauma; bleeding

Introduction

Rectus sheath hematoma (RSH) is a rare but increasingly recognized cause of acute abdominal pain, often resulting from blunt trauma or anticoagulation therapy.¹ Its incidence appears to be rising with the growing use of anticoagulants. RSH typically arises from the rupture of an epigastric artery or a tear in the rectus abdominis muscle, often triggered by direct trauma² or excessive muscle contraction. Despite its rarity, RSH presents significant diagnostic challenges, frequently mimicking critical conditions such as bowel perforation, ruptured aneurysms, or internal bleeding. Early recognition through clinical examination and imaging is vital to avoid misdiagnosis and ensure effective patient care.

Case Presentation

A 57-year-old male presented to our emergency department with left-sided lower groin pain and swelling following blunt abdominal trauma

caused by a motorbike rim piece during a repair incident. On examination, his vital signs were stable, including a sodium level of 78 mmol/L, blood pressure of 112/84 mmHg, and oxygen saturation of 95%. A 5 mm laceration was observed in the lower left abdomen, approximately 4 cm from the umbilicus. The patient exhibited localized tenderness and a palpable mass in the left groin without peritoneal irritation signs such as rebound tenderness or guarding.

Laboratory tests revealed an elevated white blood cell count of $15.2 \times 10^9/L$ (reference: $4-10 \times 10^9/L$), C-reactive protein of 28 mg/L (<5 mg/L), hemoglobin of 13.3 g/dL (13.5-17.5 g/dL), hematocrit of 36.9% (38-50%), and an international normalized ratio of 1.14 (0.8-1.2). Imaging included an abdominal X-ray and tomography, which identified a foreign body within the left rectus sheath (**Figure 1**).



Figure 1: Abdominal Pelvic Computed Tomography showing foreign body in left rectus sheath

Initially, the patient's stable condition warranted observation in the emergency department. However, during monitoring, the patient developed tachycardia. Repeat blood tests revealed a hemoglobin drop to

10.9 g/dL and hematocrit to 31.8%. Follow-up tomography showed a hematoma in the left rectus sheath with evidence of intra-abdominal bleeding (**Figure 2**). As the patient's condition worsened, including hypotension, an urgent exploratory laparotomy was performed.



Figure 2: Left Rectus sheath hematoma leading to intrabdominal on Abdominal Pelvic Computed Tomography.

Intraoperative findings showed intact small intestine, colon, spleen, and other abdominal organs. A large hematoma in the left rectus muscle extended into the peritoneal cavity. Hemostasis was achieved by suturing the bleeding vessels within the rectus muscle. A Jackson-Pratt (JP) drain

was placed between the muscle planes, and a silicone drain was positioned in the pelvic region. During surgery, the patient received two units of erythrocyte suspension and one unit of fresh frozen plasma and was transferred to the intensive care unit (ICU) for postoperative monitoring.

During the surgery, the foreign body was removed from the sheath hematoma. Postoperatively, hemoglobin dropped to 7.6 g/dL, and hematocrit fell to 22.2%. While the JP drain remained inactive, the pelvic silicone drain collected 500 cc of hemorrhagic fluid. Despite this, the

patient remained stable and received further transfusions. A follow-up CT on postoperative day 3 showed regression of the hematoma (**Figure 3**). The patient gradually improved and remained hemodynamically stable throughout the ICU stay.

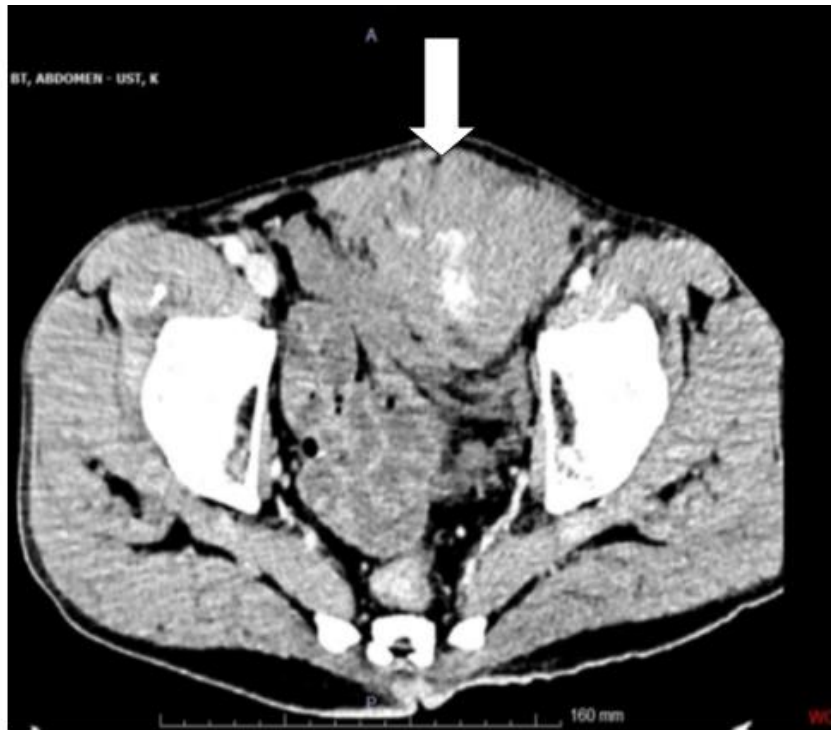


Figure 3: Resolution in Left Rectus sheath hematoma after surgery

Discussion

Rectus sheath hematoma (RSH), though rare, is a critical cause of acute abdominal pain and often difficult to diagnose in emergencies. It can mimic serious conditions like appendicitis, bowel perforation, or ruptured aneurysm, leading to misdiagnosis or delays in treatment, potentially resulting in poor outcomes.

RSH usually results from ruptured epigastric arteries or tears in the rectus abdominis muscle due to forceful contractions.³ The prevalence of RSH associated with trauma remains low, but it poses significant diagnostic and treatment challenges. While RSH accounts for less than 2% of acute abdominal pain cases, its incidence has increased with the expanded use of oral anticoagulants and non-vitamin K antagonist oral anticoagulants (NOACs). While direct trauma⁴ and anticoagulation are known risk factors, RSH can also occur after non-contact exercises, minor movements, or sudden muscle strains.⁵ Studies show that anticoagulants are involved in up to 70% of RSH case.

A thorough history and focused physical exam help distinguish RSH from other abdominal conditions, avoiding unnecessary surgery. Ultrasound is valuable for bedside assessment, while CT scans offer nearly 100% sensitivity, accurately pinpointing hematoma location.⁶

In this case, RSH developed after trauma from a motorbike rim during repair, rupturing a branch of the inferior epigastric artery and extending into the peritoneal cavity, causing rare intraperitoneal bleeding. Early diagnosis was challenging due to non-specific symptoms, stable vital signs, and an unremarkable abdominal exam. CT confirmed the diagnosis and revealed intraperitoneal extension, necessitating surgery. Ultrasound

is valuable for bedside assessment, while CT scans offer nearly 100% sensitivity, accurately pinpointing hematoma location.⁷ Intraperitoneal bleeding in RSH often requires surgical intervention, as with this patient.

Diagnosing RSH is difficult due to its rarity and non-specific symptoms, accounting for less than 2% of acute abdominal pain cases. Initial localized pain and swelling in our patient were managed conservatively, but rapid deterioration with tachycardia and hypotension required urgent surgery.^{8,9} Imaging, especially CT¹⁰, is crucial for accurate diagnosis, offering high sensitivity and localization.

RSH management depends on hematoma severity and patient stability. Most cases are treated conservatively¹¹, but surgery is required for instability, large hematomas, or intraperitoneal rupture.^{12,13} This case highlights the importance of detailed history, physical exams, and imaging to distinguish RSH, prevent unnecessary surgery, and ensure timely treatment. Intra-abdominal spread: Rare but serious, as in this case. Other reports emphasize complications such as abdominal compartment syndrome or necrosis of the rectus muscle^{12,13}.

Intraoperatively, the hematoma was found to have breached the peritoneum, a rare but serious complication requiring immediate hemostatic intervention. Surgical exploration is typically reserved for cases with significant hemodynamic instability or imaging indicating active bleeding, as in this patient. RSH management depends on hematoma severity, patient stability, and ongoing bleeding. Conservative measures, like observation and transfusions, may be sufficient in stable cases. However, in this instance, the patient's tachycardia, hypotension,

and significant hemoglobin drop necessitated surgical intervention to prevent further hemorrhage and ensure survival. Postoperatively, the patient experienced a persistent but regressing hematoma, as seen on the follow-up CT scan. This case highlights the need for close monitoring after surgery, as RSH patients can face delayed complications like hematoma reaccumulation, infection, or abdominal compartment syndrome. The patient remained hemodynamically stable with appropriate transfusions and intensive care support, and minimal drainage from the JP drain indicated effective hemostasis in the rectus sheath regio.

This case underscores the need for a high suspicion of RSH in patients with abdominal pain and a trauma history, especially with anticoagulation or other risk factors. Timely imaging and intervention can avert severe complications like intraperitoneal bleeding. It also highlights the importance of careful monitoring in stable patients, as sudden clinical deterioration can occur. The patient was monitored in the ICU, and on postoperative day 3, a follow-up CT scan showed regression of the rectus muscle hematoma (Figure 3), though it had not fully resolved. Throughout the ICU stay, the patient remained hemodynamically stable and showed gradual improvement. This case intersects with other specialties like radiology, hematology, or critical care, and underscores the need for high suspicion of RSH in trauma cases, timely intervention to prevent complications, and vigilant monitoring during recovery. The need for protocols to diagnose and manage atypical RSH presentations and further investigation are recommended. When deciding between surgery and conservative treatment for rectus sheath hematoma (RSH), patient stability and the extent of bleeding are key factors:

Conservative treatment is preferred in hemodynamically stable patients with no evidence of active bleeding or significant hematoma progression. Management includes observation, analgesics, and possible blood transfusions.

Surgery is indicated in cases with hemodynamic instability, ongoing bleeding, large or expanding hematomas, or intraperitoneal extension.

In this case, surgery became essential due to worsening tachycardia, hypotension, and significant hemoglobin drop, emphasizing timely intervention to prevent life-threatening complications. Written informed consent was obtained from the patient.

conclusion

There are many publications and case reports on rectus sheath hematoma but very rare in combination with intraperitoneal hemorrhage, this case underscores that rectus sheath hematoma (RSH), though rare, should be considered in the differential diagnosis of acute abdomen in patients with trauma or anticoagulation history. Early diagnosis and timely intervention—either conservative or surgical—are essential for improving outcomes and preventing serious complications. Ongoing awareness and documentation of RSH cases are vital for optimizing management strategies

Informed Consent

The patient was monitored in the ICU, and on postoperative day 3, a follow-up CT scan showed regression of the rectus muscle hematoma (Picture 2b), though it had not fully resolved. Throughout the ICU stay, the patient remained hemodynamically stable and showed gradual improvement.

Written informed consent was obtained from the patient.

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed. A signed consent form is available from the authors.

Disclosures

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Conflict of Interest

None declared.

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None.

Author Contributions

SS,EK: Data collection, data improvement, original draft writing, review writing, and editing, final approval. FD, YD: Data collection, software, data improvement, review writing and editing, and final approval. Each authors have approved the submitted version (and any substantially modified version that involves the author's contribution to the study);

Each authors have agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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