CASE REPORT

Rectus sheath hematoma from spontaneous inferior epigastric artery bleeding without conventional risk factors, possibly precipitated by sneezing: a case report

Rayyan Alhaqbani[1,2]*, Faisal Alhusain[1,2] and Abdullah Bahmaid[1,2]

ABSTRACT

Background: Rectus sheath hematoma (RSH) due to inferior epigastric artery (IEA) injury is a very rare cause of acute abdominal pain. A spontaneous IEA, without these risk factors, is rare and may lead to a delay in diagnosis, as it may be confused with other causes of acute abdomen.

Case Presentation: A 62-year-old male who denied any history of trauma, anticoagulation, or coagulopathy came in with a sudden onset of suprapubic pain radiating to the right lower quadrant. Preceding the pain were some sneezing fits, and there was new onset abdominal wall ecchymosis. Laboratory testing showed a slight reduction in the level of hemoglobin, and the other blood coagulation tests were normal. The left rectus abdominis intramuscular hematoma with active arterial contrast extravasation was observed on the contrast-enhanced computed tomography abdomen with a bleeding protocol, which is suggestive of left IEA bleeding. The patient was taken for emergent transcatheter embolization of the left IEA with successful hemostasis. He was discharged the next day in stable condition. He had complete resolution of symptoms and clinical improvement of the hematoma at 1-month follow-up, without any further imaging.

Conclusion: Acute abdominal pain should be included in the differential diagnosis of spontaneous IEA bleeding, even in the absence of classical risk factors for the condition, especially if the pain is preceded by a Valsalva-type stimulus, e.g., sneezing.

Keywords: Rectus sheath hematoma, inferior epigastric artery, spontaneous hemorrhage, acute abdomen, Valsalva maneuver, case report.

Introduction

Rectus sheath hematoma (RSH) is a rare condition that may develop from blood leakage from the rectus sheath caused by tears in the rectus muscle or the inferior epigastric artery (IEA) [1–3]. Abdominal trauma, iatrogenic injury (open or laparoscopic surgery), central venous catheterization, anticoagulant medications, coagulopathy, coughing, vigorous physical activity, and spontaneous bleeding (rare) are all causes of inferior epigastric artery bleeding [2–5].

Many of these conditions will have a similar presentation to bleeding in the inferior epigastric artery and can result in acute abdomen including appendicitis, diverticulitis, and perforated viscus [6]. The imaging modality of choice is contrast enhanced computed tomography (CT) of abdomen as it has high sensitivity and can differentiate IEA bleeding from other differentials [6]. Transcatheter embolization of the epigastric arteries has been successfully undertaken in selected patients with active bleeding [1, 4].

This unusual case of spontaneous bleeding of the inferior epigastric artery resulting in RSH occurred in a 62-year-old

Correspondence to: Rayyan Alhaqbani
*Emergency Medicine Department, Ministry of the National Guard – Health Affairs, King Abdullah International Medical Research Center (KAIMRC), Riyadh, Saudi Arabia.
Email: ra.alhaqbani@gmail.com
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man who had no history of trauma, anticoagulation use, or coagulopathy, and whose only precipitant was a bout of sneezing. Early recognition was crucial, and the patient was successfully treated with endovascular embolization.

Case Presentation

A 62-year-old man who had a history of bronchial asthma, prediabetes, dyslipidemia, and GERD came to the ED with suprapubic pain radiating to the right lower quadrant (RLQ) for 1 day. It was early in the morning and woke him up due to the pain. Later in the afternoon, the patient reported seeing red coloring in the abdominal skin. He said that he recently sneezed. He did not have fever, nausea, vomiting, bowel change, abdominal trauma, or previous surgeries.

The patient was well, and on examination was hemodynamically stable with a pulse rate of 88 beats/min and a blood pressure of 132/101 mmHg. Abdominal inspection was normal with pain over RLQ, which intensified with abdominal muscle contraction. There was ecchymosis from the supraumbilical area to the RLQ.

Laboratory investigations showed a hemoglobin level of 11.9 g/dL (decreased from a baseline of 13.8 g/dL), platelets 479 × 10^9/L, and WBC count 8.7 × 10^9/L. Coagulation profile, liver and renal function tests, and troponin were all within normal limits.

Contrast enhanced CT abdomen, with a bleeding protocol was carried out due to abdominal tenderness and ecchymosis. It showed an intramuscular hematoma in the left rectus abdominis (5 × 4.2 × 4.2 cm); a contrast blush was seen in arterial phase and this progressed in size and density in portal venous and delayed phases, indicating active arterial bleeding from the left inferior epigastric artery. There was right anterior abdominal wall subcutaneous fat stranding/soft tissue swelling and no intraperitoneal hemorrhage.

Urgent consultation was performed with general surgery and interventional radiology after the CT was undertaken. Selectively catheterization of the left inferior epigastric artery was performed via right common femoral access. Angiography revealed active bleeding, and the microcatheter was inserted into the bleeding arm of the vessel. The embolization was carried out with the aid of 2 mm × 4 cm and 3 mm × 6 cm EMBOLD coils. Completion angiography revealed no residual active bleeding, and there were no immediate complications.

The patient's hemoglobin post embolism was 12.3 g/dL, and the patient was hemodynamically stable. Neither did he need a transfusion of blood. Stable vital signs and normal laboratory results were obtained and the patient was discharged home the following day. He was seen in the clinic at one month where he was no longer having any abdominal pain and he had clinically improved on outpatient evaluation of the surgery, but no imaging was performed at this time.

Discussion

IEA injury is also uncommon as the cause of RSH, only 1%–2% of acute abdominal pain presentations [7]. Posterior rectus sheath is absent below the arcuate line, so that bleeding is more likely to trace along the abdominal wall musculature and into the preperitoneal space [2, 7] as seen in the patient presented here. This mechanism also accounts for the laterality of the symptoms in the presented case: while the bleeding origin was the left IEA, the pain and ecchymosis were more posteriorly, on the right side, and the CT revealed spreading of blood across the midline (right anterior abdominal wall subcutaneous stranding and edema). The side of symptoms should, therefore, not be used to localize the bleeding vessel.

Cherry and Mueller analyzed 126 cases and determined that more than 70% of cases were taking anticoagulants at the time of diagnosis, and that the usual precipitant was a preceding episode of forceful abdominal muscle contraction (most frequently coughing or straining) [8]. Coagulopathy, thrombolytic therapy, recent abdominal surgery or vascular access, pregnancy, and chronic kidney disease are other known risk factors [2, 9]. There were no risk factors for this presented patient that would make a coagulation profile necessary, such as antiplatelet or anticoagulant use, antecedent trauma, or procedure.

Forced expiration against a closed glottis, such as sneezing, coughing, vomiting, straining and heavy lifting, causes a sudden increase in the intrathoracic and intra-abdominal pressures, similar to the mechanism of coughing [10]. This pressure is exerted upon the abdominal wall musculo-visceral complex and produces mechanical stress upon the fixed perforating branches of epigastric vessels [7]. Bleeding into a RSH associated with sneezing has been reported previously in the RSH literature. Cocco et al. reported a similar patient who developed hematoma as a result of only sneezing without any other etiologic factors [11].

It is critical to make a prompt diagnosis of IEA bleeding. Ultrasound is a useful initial imaging option, as it is non-radiating, readily available and inexpensive, but may have limitations in differentiating between extraperitoneal and intraperitoneal hematomas [2, 3]. Contrast enhanced CT is still the gold standard modality. It properly defines the volume and dimensions of the hematoma, as well as the cause of bleeding [3, 6, 7]. In the presented patient, contrast-enhanced CT quickly detected active extravasation from the left IEA, confirmed angiographically.

Treatment of RSH is based on the size of the hematoma, hemodynamic stability, presence of active bleeding on imaging, and overall clinical status. Hemodynamically stable patients who are not actively bleeding usually have conservative treatment as their initial approach, such as correction of coagulopathy, fluid resuscitation, blood transfusion, ice packs, and reversal of anticoagulants [6, 8, 9]. Transarterial embolization is indicated in patients with active extravasation, large hematomas, hemodynamic instability and failure of conservative management. It is a minimally invasive technique with a low risk of complications and will be used prior to surgery [8, 9]. Surgery is considered in hemodynamically unstable patients in whom abdominal compartment syndrome occurs or when other therapies have failed [8, 9, 11]. In the presented case, a left IEA had to be

embolized for active extravasation, which was followed by a good recovery.

Conclusion

This case study illustrated that spontaneous IEA bleeding can happen in the absence of conventional risk factors. The only precipitant by which a person could be identified may be a Valsalva-type trigger, such as sneezing. Contrast-enhanced CT and prompt endovascular embolization enable good control of bleeding, without surgery being necessary, and results in excellent clinical outcomes.

List of Abbreviations

RSH	Rectus sheath hematoma
IEA	Inferior epigastric artery
CT	Computed tomography
RLQ	Right lower quadrant
WBC	White blood cell
IR	Interventional radiology

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent for publication

Informed consent was obtained from the participant.

Ethical approval

Ethical approval is not required at our institute to present an anonymous case report.

Author details

Rayyan Alhaqbani[1,2], Faisal Alhusain[1,2] and Abdullah Bahmaid[1,2]

1. Emergency Medicine Department, Ministry of the National Guard – Health Affairs, Riyadh, Saudi Arabia
2. King Abdullah International Medical Research Center (KAIMRC), Riyadh, Saudi Arabia

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