

Rectus Sheath Hematoma in an Anticoagulated Patient

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Rectus sheath hematoma is an unusual cause of painful abdominal mass.¹⁻⁵ It is frequently misdiagnosed, which may result in the performance of unnecessary surgical procedures.^{2,3} In most cases, a precipitating cause can be demonstrated.³ Causes include external trauma, strenuous activities, coughing, lifting, sneezing, vomiting, straining while urinating or defecating,^{2,6-8} golfing, pregnancy and the puerperium,^{2,9,10} anticoagulation therapy,^{1,11-15} infection,^{2,16} chronic disease,¹¹ arteriosclerosis, hypertension,² prior paracentesis or laparotomy,^{8,17} inadequate hemostasis or excessive retraction in surgery,¹² and idiopathic.¹⁶

This case report describes the association between relatively minor strain and the formation of a rectus hematoma. A review of the literature was undertaken to discuss the cause, diagnosis, and treatment of a rectus sheath hematoma.

Case Report

A 24-year-old female patient presented to a neighboring emergency department with a 24-hour history of pain and bulging in the left lower abdominal area following a bout of coughing. The pain was exacerbated when a Valsalva maneuver was performed and was somewhat relieved by lying supine. The patient reported a 2-week history of nasal congestion, dry cough, nausea, and some questionable weight loss, but no fever. She had been having normal bowel movements and normal periods and had no urinary complaints. She had been taking antitussives and aspirin daily for 2 weeks. The patient smoked 15 cigarettes per day. She had had a dilation and curettage in the past.

The patient was alert and uncomfortable. Her vital

signs were normal. Auscultation of the lungs revealed scattered rales and end-expiratory wheezes in the lower fields bilaterally. Cardiac auscultation was normal. Abdominal examination revealed a 3 cm × 6 cm tender, nonpulsatile mass in the left lateral suprapubic area. Hyperactive bowel sounds were heard over the mass as well as throughout the abdomen. A pelvic examination was unremarkable.

A complete blood count revealed 8100 white blood cells (WBC), 13% band neutrophils, 65% segmented neutrophils, 11% lymphocytes, and 11% monocytes. Hemoglobin, hematocrit, platelet, and electrolyte levels were normal. A clean-catch urine sample was positive for 1+ ketones, 8 to 12 WBC per high-power field, 0 to 3 red blood cells per high-power field, few squamous epithelial cells, and 2+ bacteria. An abdominal x-ray series was negative.

A tentative diagnosis of an incarcerated inguinal hernia was made, and the patient was transferred to our hospital for definitive care. A surgeon was consulted, and an ultrasound was obtained to differentiate between a hernia and a rectus sheath hematoma. The ultrasound confirmed the diagnosis of a left rectus hematoma (Figures 1 to 3). The patient was treated conservatively with a heating pad and analgesics, and instructed to rest. Her bronchitis was treated with antitussives and oral antibiotics. She had a fever the day after admission of 38.7°C (101.8°F), which was believed to be secondary to the resolving hematoma. Urine and blood cultures were negative. The patient was discharged in stable condition 1 day after admission.

Discussion

Rectus sheath hematoma (RSH) is a well-described entity with a reported incidence of misdiagnosis as high as 93%.¹⁻⁵ RSH occurs 2 to 3 times more often in women than men.^{2,5} The higher incidence in women is presumably due to decreased muscle mass as compared with men.¹⁸ Older patients with associated chronic disease,

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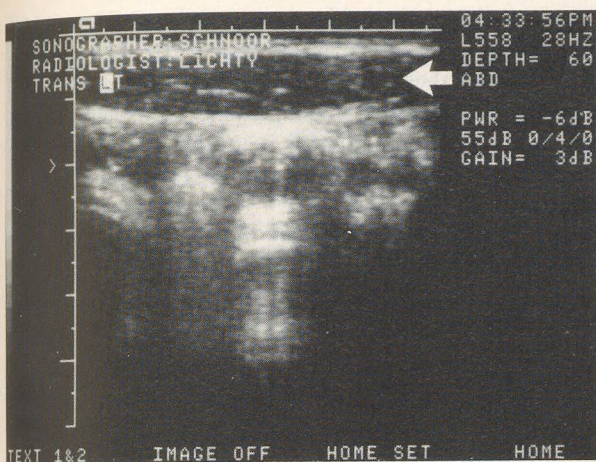


Figure 1. Arrow points to normal transverse section, superior portion, left rectus muscle.

especially if they are being treated with anticoagulants, are at increased risk.^{2,18,19} The incidence of RSH in younger men and women is about equal.³

To better understand the pathophysiology behind the formation of an RSH, a brief description of the rectus anatomy is necessary. The paired rectus muscles are intersected by three or four transverse tendinous inscriptions and are encompassed by a tendinous sheath. Segmentation of the upper portions of the muscle helps decrease the chance of vessel trauma in these areas.¹ The distal sheath is not constant posteriorly approximately 5 cm below the umbilicus. The lower portions of the rectus muscles are separated from the abdominal viscera by only a thin layer of transversalis fascia and peritoneum. Blood supply is by the superior and inferior epigastric arteries,

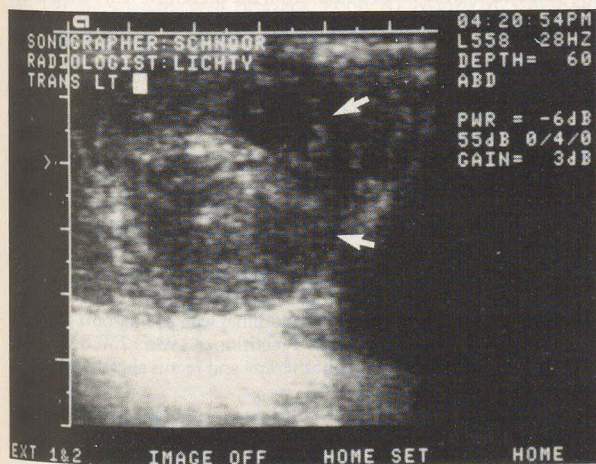


Figure 2. Transverse section, lower left rectus muscle, revealing a large (5 cm) hematoma, which obscures the normal rectus anatomy. Arrows indicate hematoma borders.

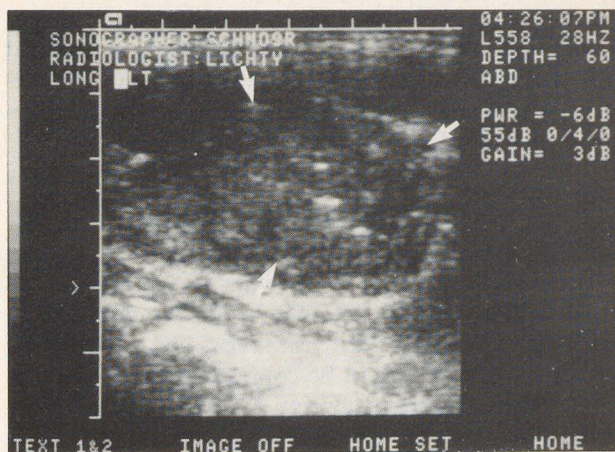


Figure 3. Longitudinal section, lower left rectus area, revealing a 6.5-cm hematoma. Arrows indicate hematoma borders.

which lie mainly on the dorsal surface of the muscle. They send branches inward and anastomose microscopically, helping to diminish the chance of trauma to the vessels during muscular contraction.^{1,2,6,7,17,20,21}

Hematomas may be caused by forceful extension or contraction of the rectus muscles, resulting in tears in branches of the inferior epigastric artery, portions of the muscle, or both.²² RSH formation may also be related to ineffective repair of minor vessel damage, eg, in the patient being treated with anticoagulants.^{1,2,11,12}

Presentation

An RSH usually presents with abdominal pain, nausea and vomiting, abdominal distention, hypoactive bowel sounds, a tender, nonpulsatile, firm, fusiform, palpable abdominal mass, and occasionally a low-grade fever.^{6,17} The hematoma is usually unilateral.^{2,17} Almost all hematomas will occur between the muscle and its posterior sheath.¹² Hematomas located above the linea semicircularis usually present as unilateral masses isolated by the rectus sheath and the tendinous inscriptions, while below this area they may dissect extensively owing to the lack of a posterior sheath wall.¹¹ Hematoma dissection into the perivesicular space can cause bladder irritation as well as oliguria from the mass effect.^{1,17} The size of the hematoma depends on the extent of the injury and the nature of the adjacent structures.²³ The mass can be bilobar and should not move with respirations.¹² Pain occurs, especially when the hematoma presses posteriorly against the parietal peritoneum, possibly giving rise to guarding and rebound that can mimic other serious intra-abdominal pathology.^{2,22} The onset of pain is usually gradual, developing over several hours, although it

can be abrupt.¹² A massive hematoma can lead to hypovolemic shock and can be confused with a ruptured abdominal aortic aneurysm.⁸ Even a relatively small hematoma has been reported to be sufficient to cause hypotension and death in the debilitated patient.²⁴

Diagnosis

Of primary importance in obtaining the correct diagnosis is to include RSH in the differential. A careful history must be obtained to elicit risk factors and precipitating events.^{3,12} Diagnosis can be confused with an incarcerated abdominal hernia, abscess, developmental remnant, tumor, ovarian cyst or torsion, acute appendicitis, intestinal obstruction, mesenteric infarction, or a rupturing abdominal aortic aneurysm.^{11,16,18,22,25} Fothergill's sign, an important examination finding, is elicited by having the patient raise his or her head while in a supine position; intra-abdominal masses will become impalpable and abdominal wall masses will become fixed and palpable. A tender mass that does not disappear with contraction of the rectus muscles is indicative of a rectus sheath hematoma.^{25,26} If the hematoma has not begun to organize, however, it may spread out during contraction of the rectus and be less noticeable.²⁷ Rectal or pelvic examination may reveal a mass effect.¹² Lateral soft tissue radiographs are diagnostically helpful in only about 12% of patients with an RSH.^{3,28} When the diagnosis is uncertain, laparoscopy has been advocated by some to help rule out intraperitoneal pathology without performing a more invasive procedure.²⁹

The two most useful diagnostic modalities are ultrasound and computerized tomography (CT). Ultrasound has been advocated as the initial procedure of choice because of its ability to give rapid, accurate information about mass size, location, and physical characteristics.^{17,26,30,31} It can be used serially to follow hematoma size and does not expose the patient to ionizing radiation.^{26,32} Ultrasonic images of hematomas are spindle-shaped on longitudinal section and ovoid on transverse section.²² When hematomas become very large, however, their shape is no longer helpful in making a diagnosis.^{17,33} Computerized tomography can be used to further delineate masses that cannot be readily diagnosed with ultrasound^{17,34}; CT of an RSH will reveal a spindle-shaped mass that dissects along the fascial planes.³³

Treatment

Prompt diagnosis of an RSH may prevent an unnecessary surgical procedure.⁶ Some authors recommend surgical exploration and drainage of an RSH.^{1,35} Mortality

rates in patients who undergo surgery range between 4% and 25%,^{3,5,12,24} which is thought to be related to the older ages of these patients and their associated disease states.¹² Conservative management is usually recommended unless the patient is hemodynamically unstable or the hematoma is increasing in size over time, or if the diagnosis is uncertain.^{3,6,7,16,17,22,24} Pregnant patients with an RSH can have a 13% mortality rate and a fetal mortality rate of up to 50%.¹⁰

Summary

Rectus sheath hematoma is an unusual though not rare cause of abdominal wall mass. There are multiple causes for RSH, and with a thorough history, usually some precipitating factor can be identified. Ultrasound and CT are useful in making an accurate diagnosis. Treatment is usually conservative unless the hematoma is enlarging or if the diagnosis is uncertain.

Key words. Hematoma; abdominal wall; muscles.

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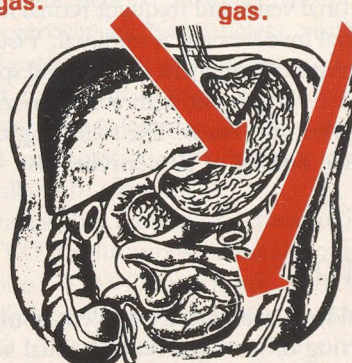
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