

## CASE REPORT

# Rectus sheath hematoma in an elderly woman under anti-coagulant therapy

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**Abstract :** Rectal sheath hematoma has been a well-known clinical entity from the ruin of the ancient Greece. It is relatively rare, however, to encounter this abdominal disorder in the clinical setting. Furthermore, the initial symptoms of rectus sheath hematoma are often similar to those of acute abdominal disorders. Therefore, the majority of the patients with rectus sheath hematoma have been treated with operative procedures because of the difficulty of a differential diagnosis from other abdominal disorders. We recently treated a 74-year female diagnosed with rectus sheath hematoma with the anticoagulants after an episode of cerebral infarction. From the findings of the physical examinations, ultrasound, and computed tomography, we could correctly diagnose, and could treat her with completely conservative methods without any invasive techniques. It is stressed that it is important to recognize this entity of rectus sheath hematoma when patients are examined, after complaining of acute abdominal pain and with evidence abdominal masses in the clinical setting. *J. Med. Invest.* 48 : 216-220, 2001

**Keywords :** *Rectus sheath hematoma*

## INTRODUCTION

Rectus sheath hematoma produced by a tear in the epigastric vessels or the muscle fibers of the rectus abdominis is a well-described clinical entity (1). It is difficult to differentiate rectus sheath hematoma from other abdominal diseases which show acute abdomen symptoms or abdominal masses, therefore, a definite diagnosis has typically been performed after surgical procedures in the majority of cases (1-3). With the current advances in imaging, such as ultrasound (US) and computed tomography (CT), proper diagnose can be made before surgery (4-10). The present study examined a patient with rectus sheath hematoma under anticoagulant therapy after cerebral infarction, which were correctly diagnosed using US and CT of the abdomen. She was treated

conservatively without any invasive techniques.

## CASE REPORT

A 74-year-old female was admitted to our hospital on 9th February, 2001, complaining of acute pain affecting the right upper abdomen. Symptoms developed suddenly following a coughing spell due to bronchitis 7 days prior to admission. The patient had a history of cerebral infarction, and had been treated with anticoagulant therapy with ticlopidine hydrochloride at a dosage of 200 mg/day. On admission, the patient's general condition was stable, however, because of the radiation of the upper abdominal pain, she had problems walking. Her blood pressure was 98/67 mmHg ; pulse rate, 72 beats per minute and regular ; respiration, 12 ; temperature ; 36.8 ; white blood cell count, 11,900 cells/mm<sup>3</sup> ; hematocrit, 39.8% ; hemoglobin, 12.6 mg/dl ; platelets count, 67.4 × 10<sup>4</sup> cells/mm<sup>3</sup> ; total bilirubin, 0.26 mg/dl ; GOT, 22 IU/liter ; GPT, 35 IU/liter ; alp, 396 IU/liter ; BUN, 11.1 mg/dl ; creatinine, 0.76 mg/dl ;

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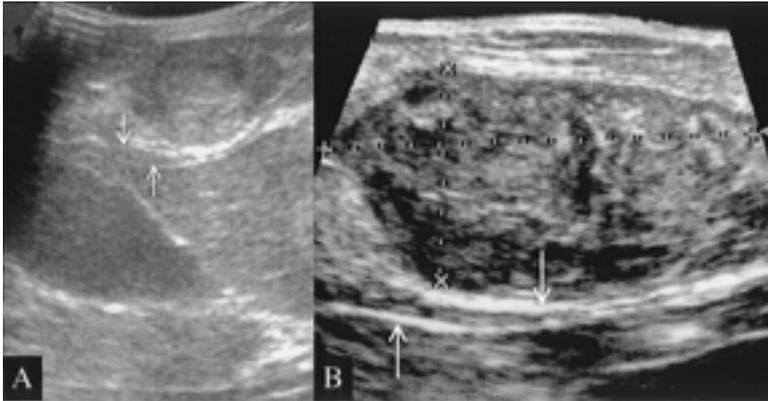


Fig. 1. Ultrasound shows a low echoic mass in the right rectus abdominis muscle (Fig.1A), and the two hyper-echoic layers in accordance with the posterior sheath of the rectus abdominis and the peritoneum (Fig.1B). Symbol  $\times$  indicates the posterior sheath of the rectus abdominis muscle, and Symbol  $\uparrow$  indicates the peritoneum.

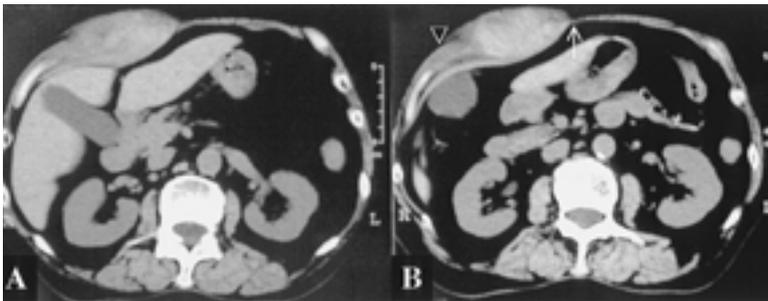


Fig. 2. Plain CT shows a high density mass in the rectus abdominis muscle, which is spindle shaped (Fig.2A). The high density mass does not extend beyond the linea alba (Symbol  $\uparrow$ ), and Laterally, the high density area extends to the subcutaneous layer, the external oblique muscle, and the preperitoneal fat layer (Symbol  $\blacktriangledown$ ) (Fig.2 B).

bleeding time, 1 minute 30 seconds ; prothorombin activity 80%, hepaplastin test, 113.3% ; thrombo test, 125.1%. Examination disclosed the presence of a tender mass under the right arcus costalis. The bulging of the mass was prompted by standing, and the size of the mass was 4.5cm by 7.5cm. Medially, the mass did not extended beyond the midline. Laterally, the border of the lateral margin of the mass was at the lateral border of the rectus abdominis muscle. On palpation, the mass had no fluctuation and no localized fever, however, the patient complained of mild tenderness. The physical findings of the abdomen, in addition to the presence of the mass, showed no sign of peritoneal irritation and the bowel sound was normal.

On US, the mass was revealed clearly within the right rectus abdominis muscle. The size was  $4.97 \times 2.44$  cm transversely (Fig. 1A). The echo level was low echoic, including the partial heterogeneous site, and the border of the mass was relatively well demarcated from the muscle. The anterior surface of the mass was contacted to the high echoic thin layer in accordance with the anterior sheath. Posteriorly, two hyper-echoic layers in accordance with the posterior sheath and the peritoneum, were well revealed. Those two layers protruded to the peritoneal cavity although they were well demarcated from the intra-abdominal cavity (Fig. 1B). The gallbladder

and the liver showed no sign of the disorder or connection to the mass, and, no fluid collection was observed.

The findings of CT also showed marked swelling of the right rectus muscle. The mass was spindle shaped, and the density of CT was high, otherwise, in part, heterogeneously low. The mass had a relatively clear demarcation from the muscle tissue, and extended from the right costal arc to the level of the umbilicus. The longitudinal length of the mass was greater than 11cm (Fig. 2A). Medially, the mass did not extend beyond the linea alba. Laterally, the mass was relatively well discriminated by the semilunar line, although the high density regions extended, in part, to the subcutaneous layer, the external oblique muscle, and the preperitoneal fat layer. The mass was revealed as a markedly high density layer (Fig. 2B). Intra-abdominal disorders were not found as well as the findings of US. From these observations, we diagnosed the patient with rectus sheath hematoma, and determined to treat her conservatively because the hematoma was restricted locally in the right upper quadrant and the size of the hematoma showed no sign of increasing. The patient was rest in bed for four days, only being permitted to walk to her private room. The anti-coagulant therapy was stopped. On the third day, a mild blue ecchymosis was observed in the



Fig. 3. Plain CT findings of the mass of the right rectus abdominis muscle are markedly decreased in size on the eleventh day.

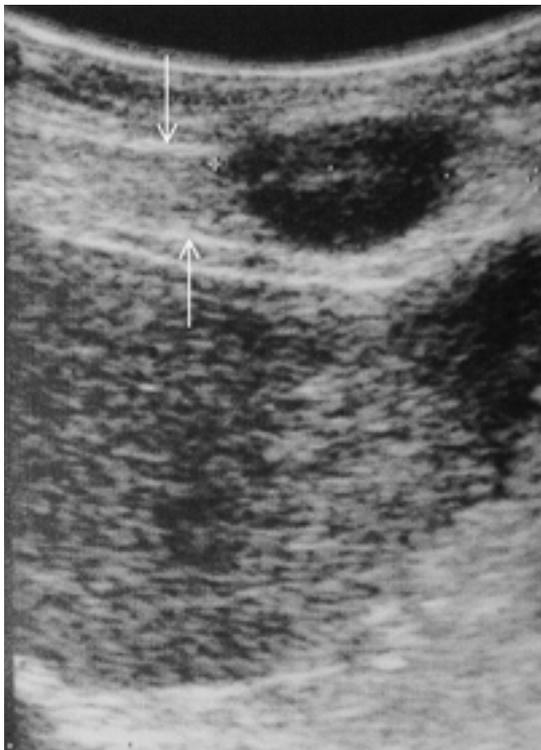


Fig. 4. Ultrasound shows a marked decrease in the mass, and the echo density is almost homogeneously low. Symbol shows the anterior rectus sheath, and Symbol shows the posterior rectus sheath.

lateral abdomen, however, the patient complained of no symptoms of peritoneal irritation and the size of the hematoma did not enlarge. On the eleventh day, the findings of CT showed a marked decrease in the size of the hematoma. The maximum breadth of the right rectus abdominis muscle, including the hematoma, was 2.8 cm. The density was still low, including the heterogeneously high density area, which suggested the formation of a clot. The

demarcation of the hematoma was clear, compared with that on admission (Fig. 3). The pain during walking gradually decreased, and the palpation of the hematoma also gradually disappeared. On the nineteenth day, the anti-coagulant therapy was again started with panardin at a dosage of 200 mg/day. On the twenty-second day, the findings of US showed a further decrease in the size of the hematoma, 3.5cm by 2.8cm. The demarcation from the rectus muscle tissue was very clear, the echo density was almost homogeneously low, and the border between the hematoma and the posterior sheath became more clear (Fig. 4). The patient was discharged on the twenty-fifth day.

## DISCUSSION

Rectus sheath hematoma is due to a rupture of the fibers of the rectus abdominis muscle or to a tear in one of the epigastric vessels with hemorrhage into the sheath of the rectus muscle (1-3), and has been termed as a rupture of the rectus muscle, spontaneous rupture of the epigastric artery, spontaneous hematoma of the abdominal wall, and spontaneous hematoma of the rectus sheath (8).

Hemorrhage within the rectus sheath may occur in a variety of conditions (1-3, 5): 1) Sudden muscular contraction, such as coughing, sneezing, sudden exertion, or strenuous exercise, 2) Direct trauma or surgical procedures, 3) Pregnancy, labor, and the puerperium, 4) Cardiovascular diseases such as arteriosclerosis, and congestive heart failure, 5) Degenerative diseases of the muscle associated with infections such as typhoid, pneumonia, influenza, leukemia, and cancer, 6) Blood dyscrasia including iatrogenic cause from administration of anticoagulants, 7) Overextension of the rectus muscle associated with obesity, abdominal aortic aneurysm, ascites, and tumor, 8) idiopathic. Teske *et al.* (1) reported that more than half of his cases were classified as idiopathic.

The present patient complained of right hypochondralgia and a palpable mass in the right upper abdomen after a spell of coughing due to bronchitis, and she had been treated with the anticoagulant medication. It is suggested that the contraction of the rectus abdominis muscle occurred abruptly, following a spell of severe coughing, which might have caused a tear in the muscle fiber or the epigastric vessels. She might have had disorders of the vessel wall because of her history of cerebral infarction,

and the anticoagulants could have easily accelerated bleeding.

Teske *et al.* (1) reported that from about 100 cases of rectus sheath hematoma it occurred much more frequently in females than in males, and the ratio was about 3:1. The age ranged from seventeen to eighty-three years, while the average age was 46.8 years, and they also suggested that it may occur at any age during adult life.

According to the clinical symptoms, the onset is often acute and there is usually a sharp, persistent, nonradiating pain in one of the abdominal quadrants (1-3). In the majority, a palpable, non-pulsating, tender abdominal mass is present in the sitting and supine positions (1 - 5). Titone *et al.* (2) reported that a palpable, non-pulsating tender abdominal mass was present in 92% of 50 cases. A mass, which is above the semicircular line, is palpable especially because the upper portion above the semicircular line is confined by the posterior sheath, and the mass should not extend beyond the midline of the abdomen or the lateral border of the sheath. In contrast, Bogatz *et al.* (11) reported that because of the lack of a posterior sheath of the rectus abdominis, the hematoma in the lower portion of the rectus sheath might extend laterally beyond the margin of the rectus sheath, medially across the midline, showing signs of peritoneal irritation, causing a prominent protrusion of the mass into the abdominal cavity, and actually rupture into the peritoneal cavity, which causes generalized peritonitis. The symptoms directly relate to the size and the location of the hematoma and the degree of peritoneal irritation of the anterior abdominal wall. Several studies have reported that a hematoma occurs most frequently in the right lower quadrants (1-3). Teske *et al.* (1) reported that the rectus sheath hematoma occurred 49% in the right lower quadrant, 22% in the left lower, 9% in the right upper and 7% in the left upper. In most cases the hematoma did not extend beyond the middle or the lateral margin of the rectus (1).

Many previous studies reported that differential diagnosis was very difficult because a hematoma in the abdominal wall had been mistaken for other conditions or lesions of the abdomen and pelvis. The most common misdiagnoses were : appendicitis, twisted ovarian cyst, idiopathic or postincisional strangulated hernia, intestinal obstruction, and malignant tumors of the abdomen (1-3).

The majority of patients previously underwent needle aspiration to intake a definite diagnosis (4, 9). However, Jones *et al.* (3) warned that when the

blood is dispersed through the muscle, aspiration is not productive, or, if the preperitoneal space is filled with blood, the positive aspiration might lead to an erroneous diagnosis of hemoperitoneum. It is suggested that the needle aspiration might cause risks of enlargement of the hematoma, especially in such cases as the present patient under anticoagulant therapy.

The recent advances in imaging techniques has markedly improved the rate of correct diagnosis for this disease. Several studies have emphasized the utility of US for the diagnosis of a hematoma because it is a rapid and noninvasive examination that requires no ionizing radiation or contrast materials. Acutely ill patients can be examined painlessly without special preparation. US scans may be made in any plane or body section with the patient in any position (5-7, 9). Wyatt *et al.* (7) described the features of ultrasound findings : (1) a mass located in the anatomical structure of the rectus sheath. Above the semicircular line, the mass is limited laterally by the semi-lunar line and medially by the linea alba. Below this level, since the sheath communicates posteriorly, the mass may project across the midline or extend inferiorly and posteriorly towards the bladder, (2) The mass may be echo free if the blood is in a liquid state. If much liquid is present, the mass may contain echoes, (3) a mass on the transverse scan, the mass may appear round, oval, or spindle shaped-above the semicircular line but usually spindle-shaped below it.

Several studies reported the advantage of CT in the diagnosis for rectus sheath hematoma (4, 8-10, 12). According to the findings of CT, Sakamoto *et al.* (12) previously reported that a hematoma is imaged as a high density or heterogenous mass in accordance with the rectus abdominis muscle, and the hematoma is clearly demarcated because the circumference of the hematoma is slightly enhanced by contrast medium. Cocke *et al.* (8) reported that CT is an accurate noninvasive method for evaluating the presence, nature, location, size, and extent of abdominal masses. Hirai *et al.* (9) reported that the combination of US and CT was more effective than US only, and the rate of the correct diagnosis was 93%, compared with 60% by US alone.

In the present case we performed an image examination, using both US and CT. By US the patient showed the classical findings, and we could neglect other disorders of the abdominal cavity, which often require emergent treatment with surgical procedures. However, the hematoma was relatively large in this

case, and the US image could not detect an extension of the hematoma. CT provided effective information according to the anatomical extension of the entire hematoma.

According to the treatment, many patients were treated by operative procedures because of the difficulty of correct diagnosis preoperatively (1-3, 5). Jones *et al.* reported that surgical treatment was required to establish the diagnosis, control the hemorrhage, evacuate the hematoma and repair the defect if possible (3). In contrast, several studies have reported the beneficial effect of conservative treatments, such as the use of sedatives, compress, ice bags, and bed rest (2, 5). Kumazawa (4) recently reported that the application of surgical treatment should be restricted to those cases that showed severe peritoneal irritation, revealed a local protrusion of the peritoneum, and, in which the hematoma was so big that is not expected to be easily absorbed.

In general, the prognosis is favorable and relapse is rare (4, 9, 10). The present patient also showed a favorable clinical course by the conservative treatment alone.

In conclusion, we reported an elderly female patient with rectus sheath hematoma, who was treated with anticoagulants. We could attain a correct diagnosis using US and CT, and could treat her conservatively. US was especially useful in the evaluation of the changes in the rectus sheath hematoma with time. It is stressed that it is important to take the anamnesis in detail and perform a careful palpation of the abdomen, taking this rare entity into consideration, when patients complain of acute abdominal pain and an abdominal mass is identified in the clinical setting.

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