Case report

Spontaneous rectus sheath hematoma associated with warfarin administration: a case report

Koji Takahashi¹, Takeshi Nihei¹, Yohei Aoki¹, Miyuki Nakagawa¹, Naoaki Konno¹, Akari Munakata¹, Ken Okawara¹, and Hiroshi Kashimura¹

¹Department of Gastroenterology, Mito Saiseikai General Hospital, Japan

Abstract

Objectives: Rectus sheath hematoma (RSH) can result from bleeding into the rectus abdominis muscle or a direct muscular tear; nontraumatic spontaneous RSH is a rare condition. Here, we report a case of spontaneous RSH associated with warfarin administration for the treatment of chronic thromboembolic pulmonary hypertension (CTEPH).

Patient: An 87-year-old woman was referred to our hospital because of abdominal pain, nausea, and vomiting for 3 days. She was receiving warfarin for treating CTEPH. She had a bulging and hard lower abdomen with ecchymosis. Moreover, the bulging portion was highly tender, and a positive Carnett’s sign was also observed. She reported no history of abdominal trauma. Abdominal computed tomography (CT) scan revealed right RSH.

Results: She was diagnosed with spontaneous RSH and admitted to our hospital. Warfarin was antagonized with an intravenous injection of vitamin K; hemostatic agents were intravenously administered. Gradually, her abdominal pain improved. She was finally discharged 12 days after the admission. Abdominal CT scan performed 17 days after the discharge revealed a reduction in the size of RSH.

Conclusion: Despite not having a history of trauma, it is necessary to consider the possibility of RSH for patients receiving warfarin and complaining of abdominal pain.

Key words: rectus sheath hematoma, warfarin, abdominal pain, Carnett’s sign

Introduction

Rectus sheath hematoma (RSH) mainly results from bleeding into the rectus abdominis muscle or a direct muscular tear. Several risk factors, such as trauma, surgery, anticoagulation, coughing, intense rectus muscle contractions, pregnancy, etc., have been reported to cause RSH⁹. Nontraumatic spontaneous RSH is a rare condition that is generally related to medical therapies⁵. RSH can cause acute abdominal pain, which can sometimes be severe. Although several patients with RSH are generally treated with conservative treatment strategies, those with unstable hemodynamics require angiographic arterial embolization or surgery⁹. Here, we report a case of spontaneous RSH associated with warfarin administration for the treatment of thromboembolic pulmonary hypertension (CTEPH). The patient was successfully treated with a conservative treatment strategy.

Case Presentation

An 87-year-old woman was referred to our hospital because of abdominal pain, nausea, and vomiting for 3 days. In addition to home oxygen therapy (2 L of oxygen/min), she was receiving warfarin (1.25 mg) for treating chronic CTEPH. Her abdominal pain deteriorated in the supine position and improved in the sitting position. The physical examination performed at her presentation to our hospital revealed a bulging and hard lower abdomen with ecchymosis. The bulging portion was highly tender; moreover, a positive Carnett’s sign was noted. Muscle defense was negative. She reported no history of abdominal trauma.

The laboratory data revealed elevated serum white blood cell count and decreased hemoglobin level. Her prothrom-
bin time/international normalized ratio (PT-INR) was 3.5 (Table 1). Non-contrast-enhanced abdominal computed tomography (CT) scan revealed a hematoma in the right rectus sheath with a dimension of $9 \times 6 \times 12$ cm (Figure 1a, b). Contrast-enhanced CT scan could not be obtained because of renal hypofunction. She was diagnosed with spontaneous RSH and admitted to our hospital.

On admission, we speculated that vascular embolization was not essential, which prompted us to select a conservative treatment. Warfarin was antagonized with an intravenous injection of vitamin K. Moreover, two hemostatic agents namely carbazochrome (50 mg) and tranexamic acid (250 mg) were intravenously administered. After admission, 600 mg of acetaminophen was orally administered to achieve analgesia. Her vital signs were stable; however, her hemoglobin level decreased to 7.4 g/dL at the 6th day of admission. Two units of erythrocyte transfusions were given; afterward, no transfusion was necessary. The patient’s post-treatment course was uneventful, and she was eventually discharged 12 days after the admission.

In this case, abdominal CT scan performed 17 days after the discharge revealed a reduction in the size of hematoma ($5 \times 3 \times 6$ cm) (Figure 2a, b). Moreover, her abdominal swelling improved, and she reported no abdominal pain. We also explained the patient about the possibility of a recurrence of RSH and that it can be fatal depending on the case. However, no recurrence of RSH was observed after discontinuing the warfarin treatment.

### Discussion

RSH was first described by Hippocrates and Galen approximately 2,500 years ago as a condition associated with abdominal trauma. It is caused by bleeding into the rectus sheath from a damaged superior or inferior epigastric artery or its branches; moreover, it can result from a direct tear of the rectus muscle. A study has reported that 1.8% of 1,257 patients who complained of abdominal pain were finally diagnosed with RSH. Nontraumatic spontaneous RSH is a rare but noncritical condition. However, in some rare cases, it may become a serious condition due to persistent bleeding. The most frequent cause of spontaneous RSH is anticoagulation therapy.

The symptoms of RSH are abdominal pain, nausea, palpable abdominal wall mass, and vomiting. Pain associated with RSH typically worsens with movements. Table 1 shows the laboratory data of the patient at admission.

#### Table 1

| WBC  | 10,500/μL | TP  | 6.7 g/dL | LDH | 265 IU/L |
|------|-----------|-----|----------|-----|----------|
| RBC  | 3.5 × 10^6/μL | Alb | 4.0 g/dL | γ-GTP | 13 IU/L |
| Hb   | 10.4 g/dL | BUN | 27.9 mg/dL | CK | 140 IU/L |
| Hct  | 32.2% | Cre | 1.20 mg/dL | T.Bil | 1.03 mg/dL |
| MCV  | 93.9 fl | Na | 144 mEq/L | CRP | 0.15 mg/dL |
| MCH  | 30.3 pg | K  | 3.8 mEq/L | PT | 12 % |
| MCHC | 32.3 g/dL | Amy | 80 mg/dL | PT-INR | 3.5 |
| Plt  | 23.1 × 10^4/μL | AST | 25 IU/L | APTT | 39.5 s |
|      |           | ALT | 13 IU/L | ATIII | 122 % |

![Figure 1](non-contrast-enhanced abdominal computed tomography (CT) scan at admission. (a) axial image; (b) sagittal image. CT scan shows a hematoma in the right rectus sheath (arrow).)
The presence of Carnett’s sign is of great significance for confirming whether the pain originates from the abdominal viscera or abdominal wall. A positive Carnett’s sign, as observed in the present case, indicates that the pain originates from the abdominal wall. Furthermore, CT scan is considered as a gold-standard diagnostic modality because of the high sensitivity (nearly 100%). Moreover, it can detect the location of hematoma and quantify its expansion into other intraperitoneal structures. Typically on a CT scan, RSH appears as a mass located posterior to the rectus abdominis along with the enlargement of the muscle. In an acute phase, hematoma appears as a hyper-dense mass in comparison with the surrounding muscle tissue.

Although RSH is rare, it can be a fatal condition with a reported overall mortality of 4%. Similar to our case, many cases of RSH are conservatively managed. However, for unstable patients, an aggressive treatment with angiographic vascular embolization is essential. Moreover, surgery is needed if the hemorrhage cannot be controlled by angiographic selective vascular embolization. In the present case, warfarin was antagonized at the earliest to maintain a stable clinical course.

In our case, there was no obvious trauma or surgical history. As the patient was receiving warfarin for CTEPH, the occurrence of RSH was attributed to warfarin. To assess the effects of warfarin, a periodic assessment of PT-INR was conducted. However, at the time of hospital presentation, her PT-INR was higher than the optimum range. Treatment with warfarin has been indicated in various diseases; moreover, use of warfarin increases with age in a number of patients. Importantly, the complications of bleeding in patients who receive warfarin need to be considered. If a patient receiving warfarin complains of abdominal pain, the possibility of RSH should essentially be considered. In such cases, the presence or absence of Carnett’s sign should also be investigated during physical examinations.

In conclusion, we report a case of spontaneous RSH associated with warfarin administration. The patient was successfully treated with a conservative treatment strategy. However, for patients receiving warfarin, it is necessary to consider the possibility of RSH even if they are without any history of trauma.

Conflicts of interest: The authors declare that there are no conflicts of interest regarding the publication of this article.

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References

1. Hatjipetrou A, Anyfantakis D, Kastanakis M. Rectus sheath hematoma: a review of the literature. Int J Surg 2015; 13: 267–271. [Medline] [CrossRef]
2. Torcia P, Rossi UG, Squarza S, et al. Spontaneous hematoma of the rectus sheath: urgent embolization with squidperi liquid embolic device. Case Rep Radiol 2017; 2017: 3420313. [Medline]
3. Manier JW. Rectus sheath hematoma. Am J Gastroenterol 1972; 57: 443–452. [Medline]
4. Klingler PJ, Wetscher G, Glaser K, et al. The use of ultrasound to differentiate rectus sheath hematoma from other acute abdominal disorders. Surg Endosc 1999; 13: 1129–1134. [Medline] [CrossRef]
5. Pieri S, Agresti P, Buquicchio GL, et al. Endovascular management of the rectus muscle hematoma. Radiol Med (Torino) 2015; 120: 951–958. [Medline] [CrossRef]
6. Sullivan LE, Wortham DC, Litton KM. Rectus sheath hematoma with low molecular weight heparin administration: a case series. BMC Res Notes 2014; 7: 586. [Medline] [CrossRef]
7. Koratula A, Bhattacharya D. Subcutaneous hematomas from prophylactic heparin use. Clin Case Rep 2017; 6: 226–227. [Medline] [CrossRef]
8. Fukuda T, Sakamoto I, Kohraki S, et al. Spontaneous rectus sheath hematomas: clinical and radiological features. Abdom Imaging 1996; 21: 58–61. [Medline] [CrossRef]
9. Velicki L, Cemerjić-Adić N, Bogdanović D, et al. Rectus sheath haematoma: enoxaparin-related complication. Acta Clin Belg 2013; 68: 147–149. [Medline]
10. Parkinson F, Khalid U, Woolgar J. Rectus sheath haematoma: a serious complication of a commonly administered drug. BMJ Case Rep 2013; 2013: bcr2012008183. [Medline] [CrossRef]
11. Jafferbhoy SF, Rustum Q, Shiwani MH. Abdominal compartment syndrome—a fatal complication from a rectus sheath haematoma. BMJ Case Rep 2012; 2012: bcr0320115332. [Medline] [CrossRef]