DOI: 10.5350/SEMB.20161028021723

# Is Conservative Management of Spontaneous Rectus Sheath Hematoma Effective?

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**ABSTRACT:**

## Is conservative management of spontaneous rectus sheath hematoma effective?

**Objective:** Spontaneous rectus sheath hematoma is a rare and often overlooked cause of acute abdominal pain. In this study, we aimed to present the results of patients with rectus sheath hematoma who received conservative treatment.

**Materials and Methods:** In this study, the demographic data, complaints, medical history, and data pertaining to the treatment provided to 9 patients were retrospectively retrieved from the computerized patient record system and imaging archives. The included patients presented with abdominal pain to our hospital's emergency room between January 2010 and 2016, were diagnosed with spontaneous rectus hematoma, and received conservative treatment.

**Results:** The female/male ratio of the 9 patients who participated in this study was 1:2, and the average age was 48.8 years. All the patients were admitted to the emergency department with abdominal pain. Three patients had a history of oral anticoagulant use, 3 patients had a history of hypertension, and 1 patient had a history of chronic obstructive pulmonary disorder. No predisposing factor was detected in the other 2 patients. There was a history of severe cough in 4 patients prior to their complaints; however, there was no history of coughing, trauma, or a surgery that would lead to this condition in the other patients. Five of the 9 patients received conservative treatment as inpatient treatment for rectus hematoma, while 4 patients received it as outpatient treatment. The average duration of hospital stay of the patients was 3 days. A cerebrovascular infarction that did not cause permanent damage developed in 1 patient 2 weeks after discharge. No additional morbidity or mortality was observed in any of the other patients.

**Conclusion:** Spontaneous rectus sheath hematoma should be considered in the differential diagnosis of abdominal pain that occurs after a persistent cough, particularly in patients receiving anticoagulant therapy. It is thought that the cases respond well to conservative treatment for etiology.

**Keywords:** Conservative treatment, hematoma, rectus

**ÖZET:**

## Spontan rektus hematomlarında konservatif yaklaşım başarılı mı?

**Amaç:** Spontan rektus kılıf hematomu akut karın ağısının nadir görülen ve sıklıkla gözden kaçan bir nedenidir. Bu çalışmamızda rektus kılıf hematomu nedeniyle konservatif tedavi uyguladığımız hastalarımıza ait sonuçlarımızı sunmayı amaçladık.

**Gereç ve Yöntem:** Çalışmamızda Ocak 2010 - 2016 tarihleri arasında hastanemiz acil servisine karın ağrısı şikayeti ile başvuran, spontan rektus hematomu tanısı konulup konservatif tedavi uygulanan 9 hastanın demografik verileri, başvuru şikayetleri, tıbbı geçmişleri ve uygulanan tedaviye ait veriler retrospektif olarak hasta dosyası, bilgisayar kayıt sistemi ve görüntüleme arşivlerinden tarandı.

**Bulgular:** Çalışmaya katılan 9 hastanın K/E oranı 1/2 olup ortalama yaş 48.8 yıl idi. Hastaların hepsi acil servise karın ağrısı şikayeti ile başvurdu. Özgeçmişlerinde 3 hastada oral antikoagulan kullanımı, 3 hastada hipertansiyon, bir hastada da kronik obstrüktif akciğer hastalığı öyküsü mevcut iken diğer iki hastada herhangi bir predispozan faktör saptanmadı. Toplam 4 hastada şikayetlerinden önce şiddetli öksürük hikayesi olduğu öğrenildi, diğer hastalarda bu duruma neden olabilecek öksürük, travma veya bir operasyon öyküsü yoktu. Rektus hematomu tanısı alan 5 hastaya yatarak, 4 hastaya da ayaktan takip ile konservatif tedavi uygulandı. Hastaların ortalama yatış süresi 3 gündü. Bir hastada taburcu edildikten 2 hafta sonra kalıcı hasar bırakmayan serebrovasküler enfarktüs gelişti. Diğer hastaların hiçbirinde ek morbidite ve mortalite gözlenmedi.

**Sonuç:** Spontan rektus kılıf hematomu özellikle antikoagulan tedavi alan hastalarda, öksürük nöbetinden sonra oluşan karın ağrısı şikayetinde ayırıcı tanıda göz önüne alınmalıdır. Vakaların etyolojiye yönelik yapılan konservatif tedaviye iyi cevap verdiği düşünülmektedir.

**Anahtar kelimeler:** konservatif tedavi, hematom, rektus

**Ş.E.E.A.H. Tıp Bülteni 2017;51(1):71-5**

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Date of receipt / Geliş tarihi:
July 3, 2016 / 3 Temmuz 2016

Date of acceptance / Kabul tarihi:
October 28, 2016 / 28 Ekim 2016

## INTRODUCTION

Rectus sheath hematoma (RSH) is characterized by abdominal pain that mimics acute abdomen, particularly in elderly patients taking anticoagulant medications. If misdiagnosed, patients undergo futile surgical procedures (1,2). Although the most frequent cause of spontaneous rectus sheath hematoma (SRH) is the use of anticoagulant medication, other etiological factors include hematological diseases, trauma, physical exercise, coughing, sneezing, pregnancy, and hypertension (3,4). SRH occurs because of the tearing of abdominal rectus muscle or inferior epigastric vessels and their branches. The tear usually occurs in the lower abdominal wall and never crosses the midline (1,5). The most common symptom of SRH is acute-onset abdominal pain with a painful abdominal mass (6). Women and elderly patients are more susceptible to this situation because of a weak rectus sheath (2).

Intravenous contrast-enhanced computed tomography (CT) of the abdomino–pelvic region is the most accurate imaging procedure for diagnosing SRH (7). If CT is contraindicated, e.g., during pregnancy, ultrasonography (USG) can help diagnose SRH (8). In total, 17% of patients who undergo surgery because of the pre-diagnosis of acute abdomen by only physical examination without any diagnostic imaging tool have SRH (9,10).

SRH is usually self-limiting. The general mortality rate of SRH is 4% (11). When SRH is diagnosed, the mortality rate can be decreased by preventing the development of abdominal compartment syndrome by obtaining hemodynamic stability via early diagnosis and conservative treatment (1,12). In this study, we aimed to present the results of patients who received conservative treatment for RSH.

## MATERIALS AND METHODS

Nine patients who were admitted to the emergency department of our hospital because of acute-onset abdominal pain and were finally diagnosed with SRH and treated by a conservative approach between January 2010 and 2016 were included in this retrospective study. The demographic data, complaints, medical history, and data pertaining to the treatment were retrospectively retrieved from the computerized patient record system and imaging archives.

RSH patients were sub-classified according to the classification system illustrated in Table 1, and treatments were determined according to this classification system (13). Fresh frozen plasma (FFP) replacement was used for patients with an international normalized ratio (INR) of >3 to lower their INR to <2.5 in order to reduce bleeding tendency. In addition, in the first 24-h follow-up period, the patients were examined with a hemogram every 6 h and their vital signs were checked every hour.

While patients who had no hemodynamic instability after the 24-h follow-up period and were diagnosed with type 1 SRH were followed up in an outpatient clinic, those who had hemodynamic stability and were diagnosed with type 2 and 3 SRH were followed up in an inpatient clinic.

## RESULTS

The average age of the 9 patients who participated in this study was 48.8 (20-68) years, and the F/M ratio was 1/2 (Table-2). All the patients who were admitted to the emergency department had complaints of abdominal pain. Seven of them had a palpable mass on their abdominal wall. For diagnosis, all the patients were evaluated with abdominal USG and intravenous

**Table-1:** Classification of Spontaneous Rectus Hematoma acording to computerized tomography findings

| | |
|---|---|
| Type 1 | Small and confined within the rectus muscle. It does not cross the midline or dissect fascial planes |
| Type 2 | Confined within the rectus muscle but can dissect along the transversalis fascial plane or cross the midline |
| Type 3 | Large, usually below the arcuate line, and often presents with evidence of hemoperitoncum and/or blood within the prevesical space of Retzius |

**Figure-1:** CT view of patient with spontaneous rectus hematoma without any comorbidity

**Figure-2:** CT view of patient with spontaneous rectus hematoma who uses warfarin

contrast-enhanced CT. Although only 2 patients (22.2%) were diagnosed with RSH via USG, all 9 were diagnosed with RSH via CT examination (Figure-1,2).

Three patients had a history of warfarin (Coumadin®, Eczacıbaşı, Istanbul, Turkey) use because of cardiac diseases, 3 patients had a history of hypertension, and 1 patient had a history of chronic obstructive pulmonary disorder. The remaining 2 patients had no predisposing factors (Table-2). The mean INR value of patients who used warfarin was 4.1 (range: 3.5–5.0). Four patients had a history of progressive coughing episodes before the presentation of abdominal pain, whereas the other 5 patients had no history of trauma or surgery. The hematoma was restricted to the infra-umbilical region in 8 patients and extended to the supra-umbilical region in 1 patient.

Using the RSH classification system, 5 patients were classified as type 1 and 4 were classified as type 2. Four of the type 1 patients had no hemodynamic instability after the 24-h follow-up period. They were discharged and followed up in an outpatient clinic. Four of the type 2 patients and 1 of the type 1 patients had hemoglobin levels lower than 8 mg/dl and were followed up in an

**Table-2:** Demographical and clinical aspects of patients

| Patient No: | Age | Sex | Medical history | INR | Medications | USG hematoma dimensions (mm) | BT hematoma dimensions (mm) | Blood transfusion | Treatment |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 50 | M | MVR | 3.90 | Warfarin | 55*37 | 60*39 | 3 FFP + 3 ES | IP |
| 2 | 45 | F | COPD | 0.93 | Formoterol+ Budesonid | | 38*27 | None | IP |
| 3 | 55 | F | HT | 1.25 | Amlodipine | | 44*39 | 2 ES | OP |
| 4 | 20 | M | None | 1.23 | None | | 50*40 | None | IP |
| 5 | 65 | M | MI | 5.00 | Warfarin | 106*96 | 100*50 | 3 FFP + 3 ES | IP |
| 6 | 52 | F | HT | 1.12 | Amlodipine | | 33*26 | 2 ES | OP |
| 7 | 46 | F | HT | 1.04 | Amlodipine | | 28*18 | None | OP |
| 8 | 38 | F | None | 1.18 | None | | 32*47 | None | OP |
| 9 | 68 | F | AF | 3.50 | Warfarin | | 40*40 | 3 FFP + 2 ES | IP |

M: Male, F: Female, MVR: Mitral valve replacement, COPD: Chronic obstructive pulmonary disease, MI: myocard infarctus, AF: Atrial fibrillation, FFP: Fresh frozen plasma, ES: Erythrocyte suspension, IP: in-patient, OP: out-patient

inpatient clinic for replacement of blood and administration of FFP. Three patients with elevated INRs received 8 units of FFP and 7 units of erythrocyte suspensions, while 2 patients with normal INR values received 5 units of erythrocyte suspensions. Patients who were hospitalized in the general surgery clinic after 24 h of emergency department follow-up, were examined with a hemogram every 12 h, and their vital signs were checked every hour. The average duration of hospital stay was 3 days (range: 1–6 days). Patients using warfarin were recommended by cardiologists to use low-molecular-weight heparin (Clexane®) instead of warfarin. Two weeks after being discharged from the hospital, 1 patient experienced a cerebrovascular infarction that did not cause any permanent damage. No additional morbidity or mortality was observed in any of the other patients.

## DISCUSSION

Although SRH is rare, its pathogenesis, clinical specifications, and treatment options are well described (14). In order to make a correct diagnosis, patients must be carefully asked about their medical history and medications. Although the F/M ratio was 1/2 in this study, the ratio has been reported to be 2/1 in the literature (2). This discrepancy may be a result of the low patient number in this study. SRH is mostly seen in the fifth decade of life and accounts for 2% of all unknown-origin abdominal pain cases (2,8,11,15). SRH occurs when the inferior and superior epigastric vessels that cross just posterior to the rectus sheath rupture or when the rectus abdominis muscle tears (16). Because of age atheromatous changes in blood vessels, elderly patients are more susceptible to SRH (17). Hematological diseases that affect homeostasis, surgical interventions, trauma, and progressive coughing episodes that increase abdominal pressure can cause SRH. In particular, a general increase in anticoagulant medication leads to SRH (3). Three patients had elevated INR because of oral anticoagulant drug usage. As a predisposing factor, we identified progressive coughing in 2 patients with a history of oral anticoagulant drug usage and 2 patients without a history of anticoagulant drug usage.

In conjunction with acute-onset abdominal pain, patients also usually present with vomiting and abdominal distention. Abdominal effort, coughing, and breathing increase the pain. During physical examinations, a painful abdominal mass with the flexion of rectus muscle (called as Fothergill's sign) can be detected via palpation (18). While all the patients had abdominal pain, 7 also had an abdominal wall mass.

For differential diagnosis of other intra-abdominal pathologies, abdominal USG and CT can be helpful. Although USG is a beneficial diagnostic tool, its sensitivity is between 70% and 90% (6). However, CT is the gold standard for the differential diagnosis of other intra-abdominal pathologies; it has 100% specificity and sensitivity (15,19,20). Although RSH was detected via USG in only 2 patients because of the size of the hematoma, experience of the radiologist, and pre-diagnosis, RSH was detected via CT in all patients.

RSH responds well to conservative treatment because of various etiological factors. If anemia occurs, blood transfusion is recommended. Further, coagulation factor deficiencies should be treated with vitamin K, FFP, and protamine sulfate (2,4,11). Although surgery is a treatment option, because decreasing the pressure at the location of the hematoma can provoke rebleeding, surgery must only be considered for hemodynamical instability despite blood transfusion and actively bleeding patients (21). Invasive treatment options include vascular embolization, USG-guided hematoma drainage, and surgical vessel ligation. Because excessively large hematomas can cause major complications such as renal insufficiency and small intestine ischemia due to abdominal compartment syndrome, USG-guided hematoma drainage must be considered (22,23). Three of the patients who were followed up in an inpatient clinic and had hemoglobin levels below 8 mg/dl and needed transfusions, had erythrocyte suspensions and FFP, and twohad only erythrocyte suspensions. Surgical intervention was not required in these patients because the transfusions stabilized their

hemodynamics. Patients using warfarin who visited the cardiology department were recommended to use low-molecular-weight heparin (Clexane®) instead of warfarin. Cerebrovascular infarction developed in one of these 3 patients 2 weeks after being discharged from the hospital. The etiology of cerebrovascular infarction was cardioembolism due to the cessation of warfarin therapy. After warfarin therapy was restarted, the patient recovered without any permanent damage.

## CONCLUSION

SRH should be considered in the differential diagnosis for complaints of abdominal pain that occurs after a persistent cough, particularly in patients receiving anticoagulant therapy. Early intervention is the most important factor for preventing complications. SRH responds well to conservative treatment because of various etiological factors.

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