

## ПРИКАЗ НА СЛУЧАЈ

## СПОНТАН ХЕМАТОМ ВО ОБВИВКАТА НА ПРАВИОТ АБДОМИНАЛЕН МУСКУЛ–СЕ ПОЧЕСТА ПРИЧИНА ЗА АКУТЕН АБДОМЕН КАЈ ПАЦИЕНТИ НА АНТИКОАГУЛАНТА ТЕРАПИЈА: ПРИКАЗ НА ДВА СЛУЧАИ

Димитар Петревски<sup>1</sup>, Наталија Цоклеска<sup>2</sup>, Лазар Тодоровиќ<sup>2</sup>, Марјан Камилоски<sup>2</sup>, Шабан Мемети<sup>2</sup>, Љупчо Донеv<sup>3</sup>, Љубица Микуновиќ<sup>3</sup>

<sup>1</sup> Медицински факултет, Универзитет Св. Кирил и Методиј, Скопје, Република Северна Македонија

<sup>2</sup> Универзитетска клиника за детска хирургија, Скопје, Република Северна Македонија

<sup>3</sup> Универзитетска клиника за трауматологија, ортопедија, анестезија, реанимација и интензивно лекување, Скопје, Република Северна Македонија

## Извадок

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**\*Кореспонденција:** Наталија Цоклеска, Универзитетска клиника за детска хирургија, Скопје, Република Северна Македонија. E-mail: [natalija.cokleska@gmail.com](mailto:natalija.cokleska@gmail.com)

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**Печатарски права:** ©2020 Наталија Цоклеска. Оваа статија е со отворен пристап дистрибуирана под условите на нелокализирана лиценца, која овозможува неограничена употреба, дистрибуција и репродукција на било кој медиум, доколку се цитираат оригиналниот(ите) автор(и) и изворот.

**Конкурентски интереси:** Авторот изјавува дека нема конкурентски интереси.

Спонтаниот хематом во обвивката на правиот абдоминален мускул е акумулација на крв во обвивката на правиот абдоминален мускул како резултат на руптура на епигастричните крвни садови или руптура на самиот мускул. Се дефинира како спонтан кај пациенти каде отсуствува анамнеза за абдоминална траума. Може да е лоциран супра или инфра умбиликално. Иако точната инциденција е непозната, Klingler и соработниците опсервирале 23 случаи (1,8%) на хематом во обвивката на правиот абдоминален мускул кај 1257 пациенти евалуирани со ехосонаграфија за акутни абдоминални нарушувања. Ехосонаграфијата може да придонесе во дијагнозата, но КТ е најточна во можноста да се дефинира лезијата. Кога се дијагностицира клинички, најчесто се започнува со конзервативен третман. Само во случај на неуспешен супортивен третман, прогресивен и голем хематом и хемодинамски нестабилен пациент, интервентниот третман вклучувајќи хируршка интервенција или некој од поновите помалку инвазивни методи е индициран. Приказ на случаи: Презентираме два случаи со спонтан хематом во обвивката на правиот абдоминален мускул кај пациенти на орална антикоагулантна терапија (асеносоагол). Главен симптом беше нагло настаната акутна абдоминална болка. При прием беа хемодинамски стабилни. По сеопфатно земена анамнеза и детален клинички преглед беше поставена суспекција за спонтан хематом во обвивката на правиот абдоминален мускул која подоцна беше и потврдена со помош на ултрасонаграфија и КТ. Обага пациента беа успешно конзервативно третирани и испуштени од болница во добра општа состојба. Заклучок: Презентираниите два случаи илустрираат точна дијагностика и конзервативен третман на спонтан хематом во обвивката на правиот абдоминален мускул со оптимален исход.

## CASE REPORT

## SPONTANEOUS RECTUS SHEATH HEMATOMA– CAUSE OF ACUTE ABDOMEN IN PATIENTS ON ANTICOAGULANT THERAPY: TWO CASE REPORTS

Dimitar Petrevski <sup>1</sup>, Natalija Cokleska <sup>2</sup>, Lazar Todorovic <sup>2</sup>, Marjan Kamiloski <sup>2</sup>, Shaban Memeti <sup>2</sup>, Ljupco Donev <sup>3</sup>, Ljubica Mikjunovikj<sup>3</sup>,

<sup>1</sup> Faculty of Medicine, Ss. Cyril and Methodius University, Skopje, Republic of North Macedonia

<sup>2</sup> University Clinic for Pediatric Surgery, Skopje, Republic of North Macedonia

<sup>3</sup> University Clinic for Traumatology, Orthopedics, Anesthesiology, Reanimation, Intensive Care and Emergency Center, Skopje, Republic of North Macedonia

## Abstract

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**Key words:** spontaneous hematoma, rectus sheath, abdominal pain, management

**\*Correspondence:** Natalija Cokleska, University Clinic for Pediatric Surgery, Skopje, Republic of North Macedonia. E-mail: [natalija.cokleska@gmail.com](mailto:natalija.cokleska@gmail.com)

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(Spontaneous) Rectus sheath hematoma ((S)RSH) is an accumulation of blood in the sheath of the rectus abdominis muscle, secondary to rupture of an epigastric vessel or muscle tear. It is defined as spontaneous in patients without history of abdominal trauma. It can be located supra- or infraumbilically. Although the exact incidence is unknown, Klingler et al. observed 23 cases (1.8%) of rectus sheath hematoma among 1257 patients evaluated by ultrasound for acute abdominal disorders. Ultrasonography can help in the diagnosis, but CT scan is most accurate in its ability to define the lesion. When diagnosed clinically, a conservative therapeutic program can usually be instituted. Only in cases of supportive management failure, progressive and large hematoma or uncontrollable hemodynamic patients, interventional management including surgery or less invasive newer techniques is indicated. Case presentation: We present two cases of SRSH in patients using oral anticoagulant agent (acenocoumarol). Their chief complaint was a sudden onset of acute abdominal pain. On admission they were haemodynamically stable. After thorough clinical evaluation a suspicion for SRSH diagnosis was made and then confirmed by ultrasonography and CT. Both of them were successfully treated conservatively and discharged home in a good general condition. Conclusion: These two cases illustrate the accurate diagnosis of SRSH treated conservatively leading to optimal patient outcomes.

## Introduction

Rectus sheath hematoma is a well-described abdominal wall pathology, however it is an unusual cause of abdominal pains and frequently overlooked cause of acute abdomen.<sup>1</sup> Rectus sheath hematoma (RSH) was first described nearly 2500 years ago, by Hippocrates and Galen who described it as a consequence of abdominal trauma.<sup>2</sup> The first published case of RSH in the United States was in 1857.<sup>3</sup> Collection of blood inside the sheath of rectus abdominis may occur secondary to rupture of superior or inferior epigastric vessels or their branches or from a direct tear of the rectus muscle.<sup>4,5,6</sup> It usually occurs spontaneously or after trauma. The branches of the epigastric arteries being connected tightly while passing through the rectus muscles and body movements create cutter and predatory power in place of the connection of arterial branches. Other predisposing factors are the increasing intraabdominal pressure depending on the blood dyscrasia, previous abdominal surgeries, anticoagulant drug use, subcutaneously applied drugs, cough or pregnancy.<sup>7,8</sup> The aging population and increased use of anticoagulant therapy without adequate control of coagulation parameters have caused a significant rise in the incidence of this condition in the last decades. SRS is usually self-limiting, but can evolve to a life-threatening emergency, especially for the elderly. This is mainly due to the low health status and various comorbidities that are observed in this group of patients, whereas delayed diagnosis plays a significant role as well.<sup>9,10,11</sup> The most common feature encountered in patients is abdominal pain, followed by an abdominal mass which is not exceeding midline and a decreased hematocrit reading.<sup>12</sup> A minority of

patients present with abdominal wall ecchymosis.<sup>13</sup> RSHs are usually formed in the lower quadrants of the abdominal wall. Below the level of the arcuate line of Douglas, the rectus sheath is absent posteriorly, and blood from the RSH may come into direct contact with the peritoneum and can cause peritonitis. The arcuate line is located a third the distance between the umbilicus and the pubic symphysis. Misinterpretation of these signs and symptoms may thus lead to a misdiagnosis of an intraabdominal process, such as ovarian pathologic conditions, appendicitis, hernia, or an abdominal wall neoplasm.<sup>14-20</sup>

Acute abdominal pain and a palpable mass after muscular strain such as coughing, sneezing, and twisting were features highly suggestive of RSH. Clinical, laboratory and radiologic data are used in diagnosis of rectus sheath hematoma. Ultrasonography (USG) and computerized tomography (CT) are considerably successful in the differentiation of other intraabdominal pathology and in establishing the diagnosis.<sup>16,21,22</sup> Correct diagnosis is compulsory in order to avoid unnecessary laparotomy. The indications for admission to the hospital are determined by the degree of hemodynamic impairment, the status of coagulation parameters, and the hematoma prevalence in imaging modalities (abdominal CT).<sup>15,23</sup> Management of coagulopathy, transfusion of blood and plasma have a major role in the treatment of patients. For continued bleeding, interventional radiologic identification and subsequent embolization is an effective option. Surgery usually involves a significant morbidity and is considered a technique of last resort. Some of the potential complications of RSH include anemia, hypovolemic shock, muscle necrosis from compartment

syndrome, and unnecessary surgery as a result of misdiagnosis. RSHs are rarely life threatening, although fatalities have been reported.<sup>20,24,25,26</sup>

The aim of this case presentation was an attempt to describe the nature of this abdominal wall pathology, its increasingly common relation with anticoagulant and antiplatelet therapy since it is being used more frequently these days. The high index of suspicion is needed to diagnose as it can closely mimic other causes of acute abdomen, inflammatory diseases or tumors of the abdomen or abdominal wall and can even lead to unnecessary laparotomies. Furthermore, we would like to stress out the importance of anticoagulant and antiplatelet therapy regulation thus avoiding complications and eventually resulting in favorable outcomes.

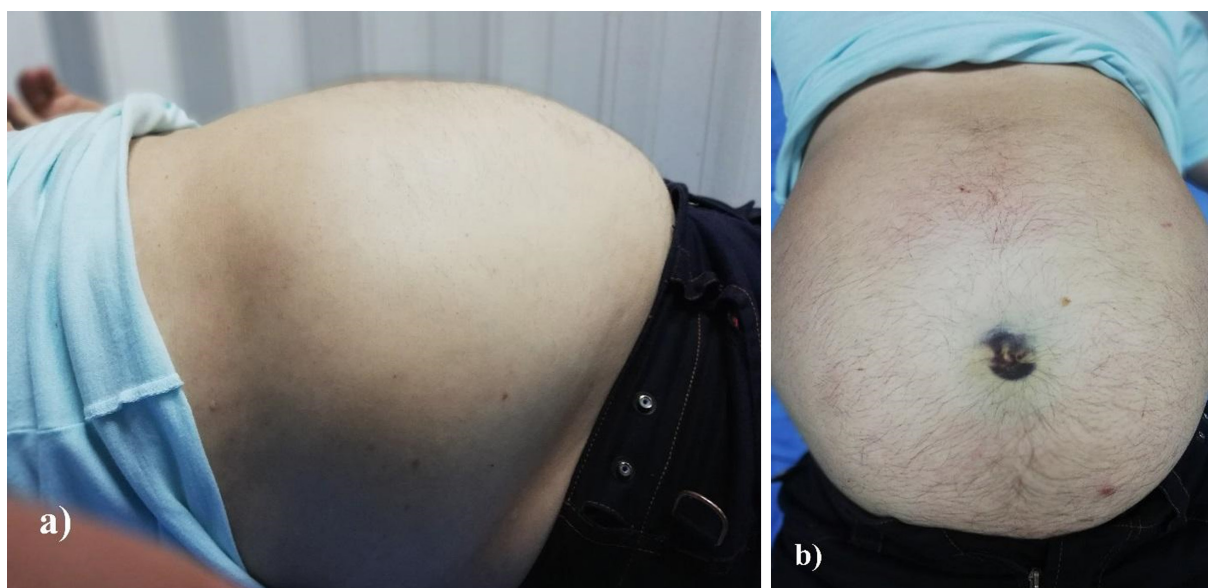
## Case presentation

### Case 1

A 63-year-old man was admitted in the emergency room with a 2-day history of acute left upper abdominal pain. He had a history of chronic obstructive pulmonary disease (COPD)

and arterial hypertension (HTA) under medical therapy. Additionally, he had atrial fibrilloflutter (AFF) and was on anticoagulant therapy with accenocumarol. He reported poor appetite but denied fever, nausea, vomiting, change in bowel habit or urinary output, cough, abdominal trauma or sport activity.

On examination he was normotensive and afebrile; on inspection there was an evident periumbilical ecchymosis (Cullen sign) (Image 1). Bowel sounds were normal. An exquisitely tender abdominal wall mass was felt at the left upper quadrant. The abdominal pain increased and the mass became more prominent when the patient tensed up the abdominal wall (Carnett sign and Fothergill's sign). His hemoglobin was 128 g/L, hematocrit 38.1%, platelet  $150 \times 10^9/L$ , leukocyte count was elevated at  $13.7 \times 10^9/L$ , CRP 264 mg/L, activated partial thromboplastin time (aPTT) 21.8 sec, prothrombin time (PT) 17.7 sec, thrombin time (TT) 15.8 sec, D-dimers 1134 ngr/ml and international normalized ratio (INR) 1.38. The other biochemical tests and abdominal X-ray were normal.



**Image 1.** a) Abdomen above level of the thorax b) Cullen's sign

Ultrasonography showed a inhomogeneous, hypoechoic oval lesion measuring 12 x 5 cm with hyper-echoic ring-shaped zone with diameter of 2.5-3 cm in the left upper part of the rectus abdominis muscle, consistent with a hematoma. Computed tomography confirmed the marked asymmetry of the rectus sheath, heterodensic, incapsu-

lated, well-defined structure with dimensions 8.3x6.3 cm (Image 2). He was treated conservatively with bed rest, analgesia, antibiotics and LMWH-enoxaparine. He was discharged from hospital 10 days after admission with resolution of signs and symptoms in a good general condition.



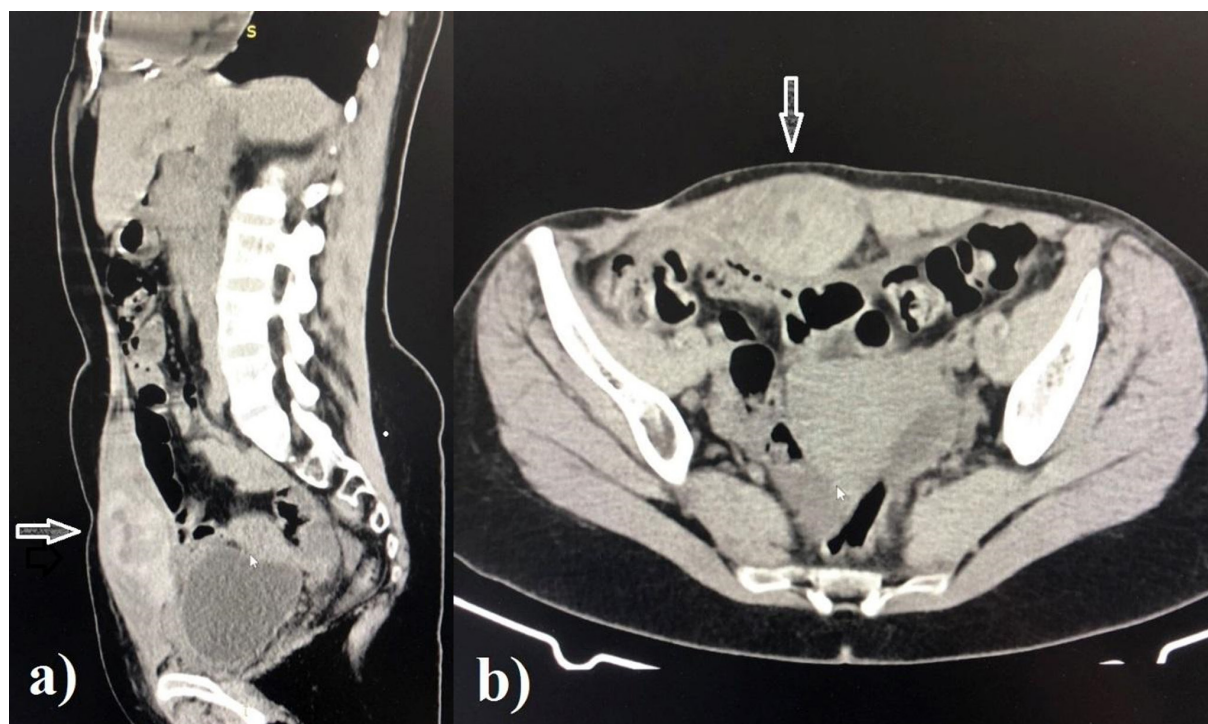
**Image 2.** a) sagittal view b) axial view c) coronal view (filled arrows-SRSH).

## Case 2

A 28-year-old woman was referred to our tertiary care institution with complaints of abdominal pain, and an abdominal mass in the right lower quadrant. She had a history of ischemic cerebrovascular disease, epilepsy, systemic lupus erythematosus (SLE), antiphospholipid syndrome and excessive coughing due to a viral upper respiratory infection. The patient had been taking acenocoumarol without medical supervision for the past few months.

On physical examination painful mass in the right lower quadrant and suprapubic region of the abdo-

men was observed. The mass was tender on palpation, but there was no rebound tenderness and muscular rigidity. Carnett's and Fothergill's tests were positive. Auscultation of the abdomen revealed active bowel sounds. Mean arterial pressure was 140/80 mmHg, pulse rate 118/min, hemoglobin level 100 g/dL, hematocrit 30.6%, platelet 160000/UL, activated partial thromboplastin time (aPTT) 65.2 sec, prothrombin time (PT) 37.4 sec, thrombin time (TT) 17.5 sec and international normalized ratio (INR)<sup>4</sup>. The other biochemical tests were normal. Abdominal CT revealed rectus sheath hematoma (Image 3).



**Image 2.** a) sagittal view b) axial view (filled arrows-SRSH)

Oral anticoagulation therapy was discontinued and the patient started receiving LMWH-enoxaparine. Blood products transfusion was not prescribed because her clinical condition was stable with no evidence of ongoing bleeding. She was discharged from hospital 6 days after admission hemodynamically stable with resolution of signs and symptoms and referred to the Internal Medicine Department for further evaluation of the other comorbidities.

## Discussion

Rectus sheath hematoma (RSH) is an increasingly common problem due to the increasing use of anticoagulation for various medical conditions. Teske's 1946 case series of 100 patients with rectus sheath hematoma showed 60% to be on the right side and more than 80% to be in the lower quadrants.<sup>24</sup> Un-

noticed trauma is considered one of the possible causes for spontaneous rectus sheath hematoma.<sup>27</sup> A vigorous contraction of the rectus muscle during defecation or cough may generate enough shear force to damage the muscle itself or tear the epigastric vessels that run between the posterior aspect of the muscle and the rectus sheath. In the study by Cherry et al.<sup>15</sup>, 29% of 126 patients with rectus sheath hematoma had a history of cough around the time of the diagnosis. In our patients, sneezing was apparently an important precipitating factor.

Anticoagulation is a known risk factor for rectus sheath hematoma. The widespread use of this therapy is believed to be a potential reason for the increased reporting of spontaneous rectus sheath hematoma.<sup>27</sup> In a review of 126 cases of rectus sheath hematoma, almost 70% of the patients were on anticoagula-

tion therapy, while 24% of them were on simultaneous anticoagulation and antiplatelet therapies.<sup>15</sup>

RSH occurs more frequently in women in the 6th and 7th decades of life.<sup>15</sup> This sex disparity is probably due to the presence of a larger rectus muscle mass in men, which provides protection against muscle and vessel injury.<sup>14</sup> The high incidence observed in elderly patients may be related to the increased use of anticoagulant agents among this population. Furthermore, rectus sheath hematoma is more commonly seen in the lower abdomen. In a recent series, 70% of the cases occurred in the lower segments of the abdominal wall.<sup>7</sup> The absence of a posterior aponeurosis below the arcuate line probably leaves the blood vessels in this area more vulnerable to injuries.<sup>15</sup>

Abdominal pain and fall in hemo-

globin with presence of risk factors (especially anticoagulation) constitute important clinical clues to the diagnosis. Common presenting symptoms are listed in Table 1. Physical examination reveals tenderness and swelling in the parietal wall. Generally, the abdominal mass in RSH does not cross the midline and, in contrast to an intraperitoneal mass, it remains conspicuous on tensing the abdominal wall musculature by head or leg raising. This is referred to as Fothergill's sign.<sup>23</sup> Similarly, tenderness remains the same or increases with head raising and is referred to as Carnett's sign.<sup>23,28</sup> Ecchymoses can be noted in the flanks or periumbilical areas, especially late in the course, and are referred to as Gray Turner's and Cullen's sign, respectively.

**Table 1.** Clinical features of rectus sheath hematoma, modified and reprinted with permission from Cherry WB et al.<sup>15</sup> © Wolters Kluwer Health

Common	Less common
Abdominal pain	Nausea/vomiting
Abdominal swelling/mass	Tachycardia
Fall in hemoglobin	Orthostatic symptoms
	Hypotension
	Ecchymosis
	Syncope
	Peritoneal signs
	Fever

The most important factor in diagnosis of RSH is to be aware of its existence.

Ultrasonography is a useful initial

test due to its wide availability and portability.<sup>16,21</sup> However, non-contrast CT scan is more sensitive and specific, and is the diagnostic mo-

dality of choice.<sup>21</sup> RSH can be classified into three subtypes based on CT appearance.<sup>13,23</sup> Sensitivity of ultrasonography used as the first diagnostic tool in RSH is 80-90%. Ultrasonography usually gives accurate information about the localization and size of the mass.<sup>21,22</sup>

CT of the abdomen is the diagnostic imaging modality of choice with 100% sensitivity and specificity diagnostic success rate and is considered superior to ultrasonography.<sup>21</sup> A hyperdense mass posterior to

the rectus abdominis muscle with ipsilateral anterolateral muscular enlargement are characteristic of acute RSH, although chronic RSH may present as an isodense or hypodense mass relative to the rectus abdominis muscle on CT scan abdomen.<sup>29</sup> It is used as well to exclude non-diagnostic abdominal ultrasonography findings and other intra-abdominal pathologies and to classify the rectus sheath hematoma.<sup>29</sup> Management strategy depends on the clinical condition and CT severity grade (Table 2).<sup>15,23</sup>

**Табела 1** Средна вредност со SD на серумското ниво на витамин Д кај испитаниците

Grade	Anatomic extension	Symptoms	Management	Time to resolve
I	Intramuscular, an increase in the size of the muscle is observed, with an ovoid or fusiform aspect and hyperdense foci or a diffusely increased density, unilateral, does not dissect along fascial planes.	Mild to moderate pain. No drop in hemoglobin.	Conservative; usually outpatient follow-up only	< 1 month
II	Bilateral, some dissection, blood between the muscle and transversalis fascia; no extension into the prevesical space.	Minor drop in hemoglobin.	Observation, short hospital stay. May need transfusion.	2-4 months
III	Bilateral, large, dissects between the transversalis fascia and muscle into the peritoneum and prevesical space.	Significant drop in hemoglobin and hemodynamic instability.	Reversal of anti-coagulants and blood transfusion. Angiographic interventions may be needed.	> 3 months

Computed tomography severity grades and suggested management strategy, modified and reprinted with permission from Osinbowale O et al.<sup>23</sup> © Sage publications.

Fortunately, the majority of cases of RSH can be successfully managed nonoperatively. Multiple case series have demonstrated that around 80% of patients may be managed with no invasive intervention, including bed rest, ice, compression, analgesia and fluid resuscitation.<sup>15,30</sup> Type I and type II RSH are managed conservatively. Type III RSH is usually managed by blood transfusion and invasive treatment.<sup>13</sup> In patients with coagulopathy, cessation of anticoagulation therapy or if needed reversal of the coagulopathy is sufficient to allow the bleeding to tamponade within the sheath. In patients with significant anemia or hemodynamic instability, transfusion of blood products is indicated. If despite these measures, the patient has persistent evidence of bleeding, the most appropriate initial intervention is angioembolization, which has been reported to control ongoing hemorrhage in virtually 100% of cases successfully.<sup>30</sup> It is rare for rectus sheath hematoma to require surgical intervention, and in fact, laparotomy for the evacuation of the hematoma and ligation of the bleeding vessel in many cases would pose a bigger risk of bleeding to the patient than is necessary, especially in patients with coagulopathy.<sup>31</sup>

Although RSH is self-limiting, it is associated with an overall mortality of approximately 4% whereas for those on anticoagulant therapy, it is 25%.<sup>20,24,25,26</sup>

## Conclusion

The incidence of spontaneous RSH is increasing as more and more patients are being treated with antiplatelet and anticoagulant therapies. RSH can frequently mimic other common abdominal emergencies leading to a delayed diagnosis. The diagnosis of RSH should be suspected in patients

who present with abdominal pain and an abdominal mass, especially if they are elderly, female, on anticoagulation therapy, or have a cough even in the absence of abdominal trauma or strain. Initial testing should include a complete blood count and CT of the abdomen and pelvis, where readily available. The treatment is mostly supportive with pain management and blood transfusions, although more aggressive therapy, including intravascular embolization or surgery, may be needed in cases of hemodynamic compromise. Although at presentation RSH can appear to be a life-threatening abdominal process, the outcomes are generally good with conservative measures, and many patients who are at high risk of thromboembolism can be safely treated with anticoagulation therapy after a diagnosis of RSH. Last but not least, timely diagnosis can prevent unnecessary diagnostic tests, unnecessary laparotomy and also decrease the morbidity and mortality.

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