



Surgical Management of A Rectus Sheath Hematoma Perforating the Bladder Wall: Multidisciplinary Approach & Literature Review

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Abstract

The Rectus Sheath Hematoma (RSH) accounts only for less than 2% of patients presenting with acute abdominal pain. In the majority of cases it's due to a spontaneous self-limiting bleeding from the inferior epigastric artery (IEA) and the treatment is conservative. We present the case of a 71 year-old woman assuming warfarin for persistent atrial fibrillation that underwent an intervention for pacemaker RCT-D positioning, who developed a large RSH invading the pelvis and eroding into the bladder wall, causing gross haematuria. This case reports highlights the uniqueness of this particular presentation and the necessity of an emergency surgical management based on the patient haemodynamic instability and hematoma characteristics.

Keywords: Rectus sheath hematoma; Bladder perforation; Hypovolemic shock

Introduction

Rectus Sheath Hematoma (RSH) accounts only for less than 2% of patients presenting with acute abdominal pain [1,2]. It is proven to be more common in women than men, at a ratio of 2-3:1, and it seems to increase with age [3,4]. In the majority of cases it's due to a spontaneous bleeding from the inferior epigastric artery (IEA) and the most predisposing factors are trauma [3,4], anticoagulation therapy [3,5], surgery/iatrogenic, cough/intense rectus muscle contraction, pregnancy, various medical conditions that cause damage to blood vessels or coagulation disorders. RSH enters into many differential diagnoses, including appendicitis, periappendiceal abscess, abdominal wall tumors and hernias, and acute splenic, biliary, diverticular, gynaecologic, or genitourinary disease, posing a diagnostic dilemma in clinical care. Considering that, with the advent of anticoagulation therapy and a prolonged life expectancy, the risk of RSH is slowly increasing [6], this case report aims to focus on the importance of a prompt identification and a correct management in order to avoid several misdiagnoses or in some cases even death. It also is the first description of a RSH eroding into the bladder wall causing bladder perforation and extra-peritoneal haemorrhage, subsequently treated with emergency surgery.

Case Presentation

A 78-year-old woman with a prior intervention, in 2003, of aortic valve replacement and coronary artery bypass graft had been admitted to our Department to evaluate suspected prosthesis degeneration. She had been suffering persistent atrial fibrillation and had been assuming Warfarin as anticoagulation. After cardiac surgeon and cardiologist evaluation, she underwent an intervention for pacemaker RCT-D (Cardiac resynchronization therapy – defibrillator) positioning and suspended warfarin, bridging her therapy with low-molecular-weight heparin. Two days after the procedure, she began to complain of increasing abdominal pain. On physical examination, she had a visible distended abdomen and a palpable, non-fluctuating mass with tenderness and guarding in the right lower quadrant. Blood pressure was 90/60 mmHg. A urinary catheter was placed and the patient was found anuric. Hemogasanalysis was normal. A hemoglobin drop from 10.4 to 7.7 g/dl was found and a computed tomography (CT) scan showed a large hematoma in the lower abdomen and pelvis, originating from a smaller one hematoma observed into the right abdominal rectus muscle, but no active bleeding was identified. After 3 hours of observation the patient conditions worsen, with dyspnea, blood pressure 80/50 mmHg and a new decrease in haemoglobin level to 6.6 g/dl, despite running transfusions of packed red blood cells. A new, urgent CT scan was advised in order to eventually find the source of bleeding. During the exam the patient referred a feeling

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Figure 1a: Coronal slice of the CT scan showing the large rectus sheath hematoma totally compressing the bladder.



Figure 1b: Coronal slice of the CT scan after urinary catheter insertion showing a partial re-expansion of the bladder and hematoma drainage through the bladder perforation.

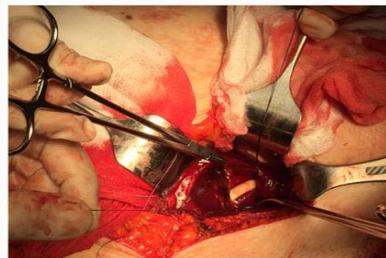


Figure 2: Hematoma evacuation and bladder wall repair. The Foley catheter is seen through the perforation.



Figure 3: Coronal slice of the CT scan control 1 month later showing the reduction of the rectus sheath hematoma and the complete integrity of the bladder wall.

of “emptying” and, concurrently, gross hematuria was observed from the urinary catheter, while CT scan showed the hematoma’s spontaneous drainage into the bladder, through a bladder wall perforation (Figure 1a and 1b). The patient, haemodynamically unstable, was carried in the operating room and a laparotomy was performed, with hematoma evacuation, bladder repair and ligation of the inferior epigastric artery, which was clearly identified as the bleeding source (Figure 2). Histological specimens of the bladder wall were taken and resulted negative for the search of neoplastic cells. After surgery the patient was extubated and transferred in our ward in stable conditions. The urinary catheter was left in for only 3 weeks in order to protect the suture and it was removed after a cystographic control. The patient was discharged in good conditions after 18 days. As completion of follow-up examination an abdominal CT scan was performed 1 month after, and showed a partial reduction of the RSH and no active bleeding sites (Figure 3).

Discussion

The arterial supply of the rectus abdominis muscle derives from the epigastric arteries. The inferior epigastric artery (IEA) runs loosely, superiorly on the posterior surface of the rectus abdominis and enters the sheath at the arcuate line (semicircular line of Douglas). This combination of loose and fixed branches leads the IEA more prone to injury, during strong muscle contractions and this explains why RSH seems to occur more often in the lower quadrant of the abdomen. Furthermore ruptures of the superior epigastric artery usually result in small, self-limiting hematomas, in contrast to those caused by IEA

rupture, that are less restricted because of the absence of posterior rectus sheath below the arcuate line [2,4].

Clinical diagnosis of RSH is based on a variety of signs and symptoms such as abdominal pain, palpable abdominal wall mass, tenderness, abdominal guarding, nausea, vomiting and eventual hemodynamic instability. Carnett's sign and Fothergill's sign can help distinguish whether the tenderness originates intra-abdominally or from the abdominal wall [4]. Nowadays, though, ultrasonography (US) and computed tomography (CT) has become the keystone in diagnosing RSH, having the CT scan sensitivity and specificity reaching 98% [7].

In our specific case, we found a type III hematoma, according to the CT classification proposed by Berna et al. [8], which extended into the prevesical space of Retzius and perforated the superior wall of the bladder, causing gross haematuria. In our opinion the cause of the erosion likely involves pressure necrosis and pressure differentials after the insertion of the urinary catheter in a collapsed bladder; but it might also derived from a locus minor is resistentiae due to a weakened native tissue.

Ada and Sandoval et al. [9,10] reported three cases of RSH perforating the bladder, all of them treated conservatively with a 6 week Foley catheter drainage. One of them though developed a bladder fistula that needed a subsequent treatment. In our case, instead, because of the hemodynamic instability of the patient and the acute abdominal pain presentation, it was chosen a surgical management in emergency conditions in order to evacuate the enlarging hematoma perform the IEA ligation and repair the bladder perforation. This led to a rapid hemodynamic stabilization and a fast mobilization of the patient with the urinary catheter left in for

only 3 weeks. During the surgical follow-up the 1 month CT-scan control revealed a reduction of the hematoma, the absence of bladder fistulas, and no other complications [11].

Conclusion

The vast majority of RSH can be treated conservatively, because usually the hematomas are self-limiting. Although, invasive haemorrhage control of RSH should be considered in hemodynamic unstable patients that don't respond to fluid resuscitation, with enlarging hematomas, severe peritoneal irritation or gross haematuria in acute bladder perforation.

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