

CASE REPORT

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Embolisation of Epigastric Artery in a Massive Rectus Sheath Hematoma After Cardiac Valvular Surgery

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ABSTRACT Increasing use of antiplatelet and anticoagulant therapies has led to a concomitant increase in the incidence of rectus sheath hematoma. Herein, we report a 55-year-old patient of massive rectus sheath hematoma and ongoing bleeding into the left rectus sheath presenting with epigastric pain and hemodynamic involvement who underwent triple valve surgery three weeks ago. The bleeding vessel of the superior epigastric artery was detected by emergency selective angiographic imaging of the left internal mammary artery, and embolization was performed successfully. Complete absorption of the hematoma was proven by computed tomography after 19 months.

Keywords: Anticoagulant; epigastric artery

Rectus sheath hematoma (RSH) is a very rare condition, it occurs more often in patients under anti-coagulation therapy. It can mimic any type of acute abdomen, and sometimes the massive hematoma can be life-threatening.¹ RSH is usually managed conservatively, but emergency surgery may be needed in cases with large or progressing hematomas with severe symptoms.² Here we present a case of 55-year-old female presented with acute epigastric pain three weeks after triple cardiac valve surgery. Abdominal ultrasound (US) and computed tomography (CT) revealed large RSH and ongoing bleeding was detected by repeated US. We found out the RSH associated with superficial epigastric artery (SEA) bleeding by doing selective angiography of left internal mammary artery (LIMA). The patient was treated successfully by embolization of the bleeding artery through LIMA.

CASE REPORT

This study was carried out after written consent was obtained from the patient and her family. A 55-year-

old female patient was admitted to our emergency department for acute onset of abdominal pain started four hours earlier. Medical history included triple cardiac valve surgery three weeks before at our center. The patient was taking warfarin, amiodarone, metoprolol, and spironolactone daily. On admission, blood pressure and heart rate were 65/40 mmHg and 108 beat/min respectively, rapid atrial fibrillation was existed on electrocardiography (ECG). Physical examination revealed moderate swelling and evident mass on the left abdomen, mild tenderness and guarding were noted in the left lower quadrant, there were no obvious abdominal distension or ecchymosis. Bowel sounds were normal. Laboratory tests were shown as hemoglobin 9.2 g/dl, hematocrit 27%, INR 2,3, urine and arterial blood gas analysis were normal. Echocardiographic evaluation had found functional mitral and aortic prosthetic valve and minimal tricuspid regurgitation, left ventricular ejection fraction was 62%. On abdominal US, there was a collection of dense content resembling hematoma

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FIGURE 1: Left rectus hematoma (arrow) at different anatomic level.

and reached 17 cm in its deepest position along proximal rectus sheath to the lower abdomen and pelvis. On contrast CT scan, gradually expanding hematoma was confirmed from subxiphoid to the distal pelvis in the rectus sheath (Figure 1a-c). Neither aortic aneurysm nor the contrast leakage was found on CT angiography. The patient was given one package of fresh frozen plasma and erythrocyte suspension.

An increase in hematoma size was observed when the second abdominal US was performed one hour later and it reached 19 cm depth. As the hematoma was limited in the left rectus sheath, we suspected LIMA perforation. Bilateral internal mammary artery was selectively visualized through the left femoral artery. A contrast leakage from the left SEA, the continuation of the LIMA, was observed on the angiography (Figure 2a). Right internal mammary artery (RIMA) was normal. Embolization was performed with glue injection (n-Butyl 2-Cyanoacrylate) through microcatheter (2.7 Fr, Terumo Progreat) advanced through the LIMA (Figure 2b). Control angiography showed the distal LIMA was obstructed and the contrast leakage was disappeared

(Figure 2c). On the 2nd day, urine output decreased due to the obstruction of the left ureter by rectus sheath hematoma. A 4.8F double-J stent was placed in the left ureter in 26 cm length under fluoroscopy. After then, the patient's urine output returned to normal. On the 5th postoperative day, the patient was discharged as clinically recovered. Hematoma was decreased to 7 cm after nine-month. Completely healing was revealed by CT scan after 19 months follow-up (Figure 3a-c).

DISCUSSION

RSH is an uncommon cause of abdominal pain. It is the result of bleeding into the rectus sheath from damaged superior or inferior epigastric arteries and veins or their branches, and also from a direct tear of the rectus muscle. In 1999, Klingler et al. found an incidence of 1,8% among 1257 patients admitted to the hospital with abdominal pain and undergoing US for diagnosis.¹ The incidence was higher in females and the elderly population, it is thought to be on the rise with the increased use of oral anticoagulants and low molecular weight heparin.^{3,4} The RSH is usually a self-limiting entity, but can cause hypov-

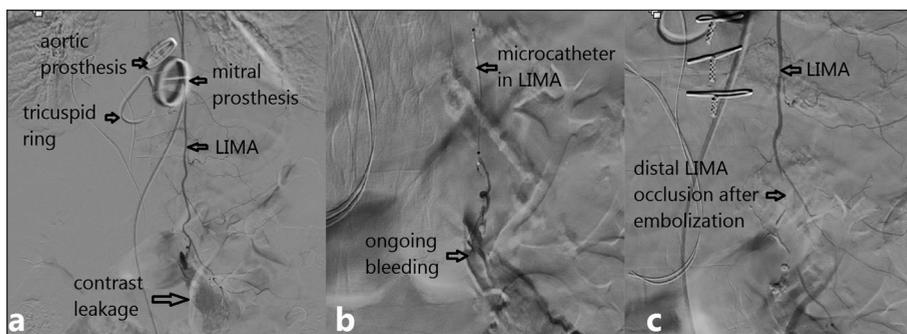


FIGURE 2: Selective LIMA angiography and embolization. a) Contrast leakage b) microcatheter placement c) embolization.

LIMA: Left internal mammary artery.

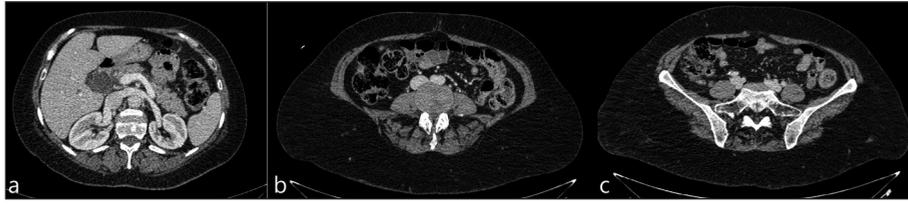


FIGURE 3: Postoperative healed left rectus sheath hematoma after 19 months.

olemic shock following sufficient expansion with associated mortality.⁵

Abdominal pain and fall in hemoglobin with the presence of risk factors (especially anticoagulation) constitute important clinical clues to the diagnosis.⁶ Physical examination may be tenderness and swelling in the abdomen. The Fothergill sign is useful in determining whether an abdominal mass is part of the abdominal wall or it is in the abdomen. US is a useful initial test due to its wide availability and portability. In this case, we found out that CT angiography had no diagnostic value to detect bleeding vessels in the rectus sheath. We also realized that repeated US was an important decisive factor in the selection of conservative or surgical treatment. The increase in the size of hematoma may be a sign for surgery.

Conservative approach was defined as the first option in large series. Surgery might be considered in those patients with ongoing bleeding and hemodynamic instability in spite of conservative therapy.⁷ Surgical drainage of the hematoma is discouraged, because this may cause continuous bleeding by reducing potential abdominal tamponade.⁸ Limited studies show selective epigastric artery embolisation have more than 90% of success rate when conservative therapy is failure.⁹ In this case, when US was repeated one hour after initial diagnosis, we found the extent of subxiphoid hematoma was increased for about two centimetres. So we came to a conclusion that conservative therapy was not an appropriate option for this patient because of ongoing bleeding. Surgical management can be associated with significant morbidity and mortality due to prolonged prothrombin time and hemodynamic instability in such cases.² Hemostatic agents such as K vitamin antagonists may

have potential thromboembolic complications in patients with mechanical cardiac valve prosthesis. We believe selective LIMA imaging and embolization through the femoral artery is a safe and less invasive procedure in treating RSH patient who is taking anticoagulant.

In conclusion, immediate selective angiography and embolization of the bleeding vessels may be a fast and life-saving method with low mortality in critical RSH patients. Repeated US may give valuable clue for treatment option in the decision-making period.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Design: Emin Can Ata; **Control/Supervision:** Emin Can Ata; **Data Collection and/or Processing:** Emin Can Ata; **Analysis and/or Interpretation:** Emin Can Ata; **Literature Review: Writing the Article:** Emin Can Ata; **Critical Review:** Mustafa Güden; **References and Fundings:** Cengiz Erol; **Materials:** Emin Can Ata.

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