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Case Report

Surgical Management of Left Upper Quadrant Sided Rectus Sheath Hematoma Occurred by Coughing in a Hemodialysis Patient

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Rectus sheath hematoma (RSH) is a rarely-occurring disease that is usually associated with anticoagulation, trauma, or spontaneous events. Most spontaneous rectus sheath hematomas may be relieved with conservative management. However, some extreme situations need surgical approach. Respecting the fact that the inferior epigastric artery mainly supplies the rectus abdominis muscle, interrupting its proximal side would cease the bleeding. We present a stepped procedure of ligation of the inferior epigastric artery and evacuation of hematoma with good field of vision in case of rectus sheath hematoma in hemodialysis patient.

Key words: Rectus abdominis – Hematoma

Rectus sheath hematoma (RSH) is a rarely-occurring disease. Most spontaneous rectus sheath hematoma may be relieved with conservative management. However, some cases need interventional approach. One way is coil embolization of the epigastric artery through arteriography.[1] However, embolization is time-consuming, expensive, and sometimes not available. In such cases, it is possible to directly ligate the inferior epigastric artery just below the hematoma location at its proximal with separated skin incision and it enables the hematoma to be evacuated easily with good field of vision.[2] We reported on a patient on hemodialysis who presented with rectus sheath hematoma at left upper quadrant abdomen accompanied by coughing, and introduced a simplified surgical procedure.

Case Report

A 51-year-old man was admitted with sudden onset of abdominal pain after coughing. He had

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Fig. 1 Enhanced computed tomography of abdomen. There is about 8.2 × 3.0 × 6.3-cm sized heterogeneous soft tissue mass-like lesions at the left upper abdominal wall with central low density area.

been suffering from hypertension and end-stage renal disease. He had continuous ambulatory peritoneal dialysis catheter insertion 13 years ago and changed to hemodialysis 9 years ago using radio-cephalic arteriovenous fistula of left forearm, which has been maintained since. He had mitral valve replacement 8 years ago for severe mitral regurgitation. The patient was on prednisolone, misoprostol, losartan, amlodipine, carvedilol, digoxin, and low-dose aspirin. Physical examinations revealed abdominal swelling, mild tenderness, guarding, and normal bowel sounds in left upper quadrant. Hemoglobin was 12.2 g/dL, hematocrit 36.8%, platelet 121000/μℓ, prothrombin time (PT) 100%, international normalized ratio (INR) 0.96, and activated partial thromboplastin time (aPTT) 35.0 s. Computed tomography revealed an 8.2 × 3 × 6.3 cm RSH located in the left upper quadrant abdominal wall without active contrast extravasation (Fig. 1). Aspirin was stopped and conservative therapy with pain control and cough control including codeine and antihistamine was administered. Heparin-free hemodialysis was performed. The patient remained hemodynamically stable with no more bleeding. He was discharged after 10 days of conservative therapy.

However, he was readmitted after lifting some heavy chairs, with aggravated abdominal pain and a two times increased size of hematoma. Hemoglobin decreased to 9.7g/dL, hematocrit to 29.2%. Operation was planned and preoperative labs showed platelet 139000/μℓ, PT 100%, INR 0.94%, and aPTT 36.5 s. Under general anesthesia, the location of hematoma and rise of the inferior epigastric artery was identified with Doppler ultrasound (Fig. 2). A 2-cm longitudinal skin incision was made 1 cm below

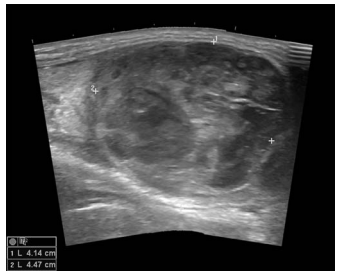

Fig. 2 Ultrasound of abdomen showed varying echogenicities that suggest a hematoma in different stages of organized clot formation.

the inferior margin of hematoma was made. The rectus muscle was dissected and the inferior epigastric artery was ligated with black silk. A separated 4-cm longitudinal skin incision at the site of hematoma was made after that. The anterior fascia of rectus muscle was dissected and huge hematoma was evacuated. There was no more bleeding from the vessels but complete hemostasis was difficult due to oozing, and the surgery was ended with SURGICEL (Johnson & Johnson Medical Ltd. North Yorkshire, UK) and thrombin gauze packing. Postoperative labs showed hemoglobin 8.8 g/dL, hematocrit 26.7% and platelet 111000/μℓ. Packing gauze was changed daily, oozing decreased after 3 postoperative days, and the wound was closed after the closed drain insertion. There were no further complications. Heparin was discontinued during hemodialysis until the patient was discharged from the hospital on the 14th postoperative day.

Discussion

RSH is a rarely-occurring condition characterized by acute abdominal pain and mass. It is more frequent in women than men and on right lower quadrant side. Risk factors for RSH include coughing and anticoagulant use, as well as female sex, chronic liver disease, pregnancy, increasing age, trauma, exertion, and obesity.[3] In the Mayo Clinic series, while the most frequent predisposing factor is anticoagulants, the most common trigger factor is paroxysmal coughing.[3]

In this patient, acute paroxysmal coughing was considered as a trigger factor of RSH. The symptoms improved with conservative therapy, but again triggered and exacerbated by lifting heavy chairs. When a patient with RSH is discharged from the hospital with improved condition after first-line

conservative therapy, he/she should be educated to avoid risks and trigger factors.

Although rectus sheath hematoma is frequently occurred at right and lower abdomen, it could also appear on the upper side. The patient in the case presented left upper quadrant mass. When patient who has risk factors and complaint of painful abdominal mass, it should be considered as RSH, even if it was not in the lower abdomen.

Most spontaneous RSH may be self-improved with conservative therapy including pain control, collection of coagulopathies, anticoagulation stop, intravenous fluid, and if necessary, transfusion. In the Mayo Clinic series, almost 90% of patients were managed successfully in this manner.[3] When there is active bleeding, depend on severity and progression of hemorrhage, it is necessary to control bleeding either by using angiographic embolization of bleeding epigastric artery or operative evacuation of the hematoma and hemostasis, in spite of conservative therapy.

From the perspective of noninvasive treatment, coil embolization can be considered as first choice of treatment. However, coil embolization is time consuming, expensive, not always available in cases of contrast allergy, hemodynamic unstability, having difficulty to identifying bleeder and having risk of contrast-induced nephropathy.[1] When surgically treated, it has to be considered that direct opening can cause a pressure drop inside of the hematoma and worsen bleeding by removing tamponade effect. In such cases, it's possible to directly ligate the inferior epigastric artery just below the hematoma location at its proximal and evacuate the hematoma easily with good operative field of vision.[2]

Mantelas *et al*[2] introduced a simplified emergency surgical approach of rectus sheath hematoma. During total colectomy operation, extending extraperitoneal RSH was identified. An incision 1 cm above and parallel to the inguinal ligament at its medial third was made. The common femoral artery was dissected and the origin of the inferior epigastric artery was identified and ligated with immediate hemodynamic improvement. However, it was not described whether they removed hematoma. It seems that they just ligated the epigastric vessels and prevented hematoma extending. Unlikely, we planned and preceded epigastric vessel ligation by separated skin incision for the hematoma removal. First, we confirmed the location of hematoma by ultrasound, then we had ligated vessels and evacuated hematoma completely with good field of vision.[4] The patient had an uneventful recovery and was discharged.

The inferior epigastric artery runs superiorly on the posterior surface of the rectus muscle, enters the rectus fascia at the arcuate line, and helps to supply the rectus abdominis muscle. The superior epigastric artery also supplies but has small segmental contribution. Respecting this fact, if the inferior epigastric artery is interrupted proximally the bleeding would cease. In our case, separated incision and ligation of the inferior epigastric artery helped to prevent expanding hematoma and to clear operative field of vision. Considering that this technique is safe, rapid and relatively easy to perform, this could be performed in extreme situations for a severely bleeding rectus sheath hematoma.

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