

MORNING REPORT: PART I

Rectus Sheath Hematoma in the Setting of Anticoagulation

Murtaza Saifee, MS3 (presenter), and Maygen Del Castillo, MD (discussant, in italic)

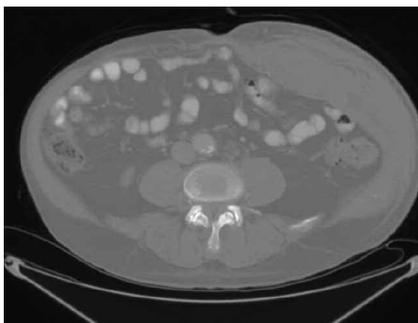
Mr. Saifee is a third-year medical student at the Baylor College of Medicine, and Dr. Del Castillo is a resident in the department of internal medicine at the Baylor College of Medicine.

A 71-year-old Caucasian male with a history of coronary artery disease, mechanical mitral valve replacement 14 years ago, atrial fibrillation, and ischemic cerebrovascular accident presents to the hospital from clinic with a two-day history of left lower abdominal wall tenderness, swelling, and spreading erythema. The patient was preparing for an upcoming colonoscopy to evaluate anemia and had held his warfarin seven days prior to the procedure and started therapeutic enoxaparin subcutaneous injections (1 mg/kg sq bid) four days prior to admission.

Two days after initiation of enoxaparin, the patient noticed a sharp pain and a small red nodule after self-injecting enoxaparin into the left lower quadrant of his abdomen. Since then, the lesion has become ecchymotic and spread laterally and posteriorly into the left flank with increasing pain. Upon further questioning, the patient reports having injected enoxaparin directly into his abdomen without pinching his skin. Of note, the patient has bridged off warfarin with enoxaparin injections several times in the past for procedures without any complications.

The patient denies lightheadedness, chest pain, or shortness of breath. He has no bright red blood per rectum or melena. He does not have any hematemesis, reflux symptoms, or coffee ground emesis. He has no bruising or gum bleeding. He is not taking any other anticoagulants or antiplatelets.

Given that the patient is on therapeutic anticoagulation, there is concern for intra-abdominal bleeding. The patient's presentation is most consistent with a rectus sheath hematoma (RSH). RSHs are uncommon causes of abdominal pain, caused by hemorrhage into the rectus sheath due to



shearing of the superior or inferior epigastric arteries or direct trauma to the muscle itself. They are often associated with anticoagulation therapy and can be spontaneous or secondary to trauma or abdominal straining. While rarely fatal, RSHs should be promptly evaluated and diagnosed to avoid unnecessary laparotomies to investigate the etiology of the acute abdominal pain. Less likely causes of abdominal pain in this setting include superficial injection site hematoma, hemorrhagic peptic ulcer disease, ischemic bowel, infectious colitis, diverticulitis, omental infarction, and inflammatory bowel disease.

On presentation, he is afebrile, and his vital signs are stable with a blood pressure of 151/96 and a heart rate of 96 bpm. Abdominal examination shows a large left-sided erythematous and ecchymotic plaque with mild induration that extends from the umbilicus to the left flank, with significant protrusion, swelling, and tenderness. The lesion now extends 3 cm past the demarcating line drawn three hours ago.

The patient's physical exam shows a quickly advancing abdominal lesion indicating an active bleeding process. His vital signs are stable, indicating current appropriate compensation for his blood loss. Further enoxaparin should be held. In addition, reversal agents such as protamine should be considered in cases



of life-threatening bleeding. If the last dose of enoxaparin was within 8 hours, 1 mg of protamine per 1 mg enoxaparin can be given; if between 8 and 12 hours, 0.5 mg protamine can be given. In general, protamine is unlikely to be helpful after 12 hours. However, even with higher doses of protamine, the aPTT may remain prolonged to a greater extent than usually seen with unfractionated heparin. Anti-factor Xa activity is never completely neutralized (maximum about 60%). Laboratory data will be helpful in risk stratifying the patient, and abdominal and pelvis CT is the diagnostic test of choice.

Subsequent labs show hemoglobin of 11.7 g/dL, platelet count of 190 K/cmm, and INR of 1.58. A CT scan of the abdomen reveals a left ventral and lateral abdominal wall hematoma measuring 19 cm by 4.9 cm in the subcutaneous and intramuscular regions.

Given the large size and rapid progression of the hematoma, the patient is transferred to the medical ICU, where IV access is established with serial hemoglobin and hematocrit monitoring. Later that evening, the patient undergoes an emergent transcatheter vascular embolization of the left epigastric artery by interventional radiology without any complications.

Two days post-embolization, the patient is bridged with heparin drip

continued on page 2

MORNING REPORT: PART I

continued from page 1

for five days until his warfarin therapy is therapeutic (i.e. INR 2-3).

The decision to restart anticoagulation is difficult in this patient as one must balance the risks of rebleeding versus thromboembolic events. Large studies of RSH have demonstrated a 4.9% risk of recurrent RSH in patients who were restarted on anticoagulation therapy. We determined the patient's risk was 10% per year for a catastrophic thromboembolic event off anticoagulation. Due to the risk of rebleeding, such patients should be closely monitored for several days to ensure no repeat bleeding occurs.

A majority of RSHs occurs in the setting of anticoagulation, with reported values up to 69%. Outpatient therapeutic anticoagulation is typically performed with enoxaparin, warfarin, or novel direct thrombin or factor Xa inhibitors. Enoxaparin is a low-molecular-weight heparin (LMWH) drug administered subcutaneously, which offers convenient dosing without required monitoring. Its ease of administration has facilitated increased outpatient use in recent years and allows the patient, family members, or caretakers greater participation in care. However, despite its convenience, there are significant risks associated with its use, including major bleeding.

Although our patient has had successful experiences in the past with using enoxaparin to bridge off warfarin for procedures, he still developed complications. Thus, clinicians should be vigilant of complications of anticoagulation in both newly and chronically anticoag-

ulated patients. Patients should also be educated on proper injection technique, especially the importance of injecting pinched skin to avoid the underlying muscle and blood vessel.

This patient's experience highlights that outpatient anticoagulation therapy not only has critical importance in several diseases but also has many associated risks, including RSH. Subcutaneous enoxaparin has gained significant popularity in recent years due to its convenient dosing and lack of required monitoring; it has been specifically adopted in several situations, including anticoagulation in pregnancy, hypercoagulability of malignancy, and those bridging off warfarin for medical or surgical procedures (as in this case). Patient education and counseling regarding anticoagulation and subcutaneous administration have become critically important to help reduce the risks of such complications. Education and vigilance should not be limited to just enoxaparin but also other subcutaneously administered medications, such as insulin, octreotide, and epoetin alfa.

Key Points

- Recognize the clinical signs and symptoms of rectus sheath hematoma (RSH).
- Assess the risks of outpatient anticoagulation therapy.
- Manage the risks associated with restarting anticoagulation therapy vs. rebleeding.

References

1. Berna JD, Zuazu I, Madrigal M, Garcia-Medina V, Fernandez C,

Guirado F. Conservative treatment of large rectus sheath hematoma in patients undergoing anticoagulant therapy. *Abdom Imaging* 2000; 25:230-4.

2. Cannegieter SC, Rosendaal FR, Briet E. Thromboembolic and bleeding complications in patients with mechanical heart valve prostheses. *Circulation* 1994; 89:635-41.
3. Cherry WB, Mueller PS. Rectus sheath hematoma. *Medicine* 2006; 85(2):105-10.
4. Firoozbakhsh S, Parsaei R, Jafarshad R. Hematoma of rectus sheath following subcutaneous enoxaparin injection. *Acta Med Iran* 2013; 51(5):334-6.
5. Holmes SJ, Yale SH, Mazza JJ. Rectus sheath hematoma as a cause of acute abdominal pain. *Am Fam Physician* 2001; 64:1681-2.
6. Kayrak M, Bacaksiz A, Yazici M. Is enoxaparin injection from the abdominal wall safe in elderly people? A fatal case of rectus sheath hematoma. *Can Fam Physician* 2008; 54:1246-8.
7. LaPointe NMA, Chen AY, Alexander KP, et al. Enoxaparin dosing and associated risk of in-hospital bleeding and death in patients with non ST-segment elevation acute coronary syndromes. *Arch Intern Med* 2007; 167(14):1539-44.
8. Salemis NS, Oikonomakis I, Lagoudianakis E, et al. Enoxaparin-induced spontaneous massive retroperitoneal hematoma with fatal outcome. *Am J Emerg Med* 2014; 32:1559.

SGIM