A complication of enoxaparin injection

A 78-Year-Old Woman Presented to the Emergency Department with Shortness of Breath and Palpitations and Was Found to Have Atrial Fibrillation with Rapid Ventricular Response. Medical Therapy with Drug Therapy and Cardioversion Proved Ineffective. She Then Underwent Atrioventricular Node Ablation and Placement of a Pacemaker.

At the Time of Admission, Anticoagulation Was Started with Full-Dose Enoxaparin, Injected Subcutaneously on the Left Side of the Abdominal Wall, as Her CHA₂DS₂-VASc Score (http://chadvasc.org) Was 5, Due to Age, Female Sex, and History of Heart Failure and Hypertension.

Four Days after Admission, She Reported Lower Abdominal Pain, and Her Urine Output Was Minimal. A Bladder Scan Showed More than 500 mL of Residual Urine. She Was Hemodynamically Stable, But Physical Examination Revealed Mild Abdominal Distention and Tenderness in the Suprapubic Region. Laboratory Testing Showed a Sharp Rise in Serum Creatinine and a Drop in Hematocrit.

Computed Tomography of the Abdomen Revealed a Hematoma Measuring 15 by 15 cm Within the Paracolic Gutter and Pelvis, Compressing the Bladder and Causing Left-Sided Hydronephrosis (Figure 1). Her Laboratory Abnormalities Were Therefore Interpreted as Postrenal Acute Kidney Injury and Anemia Due to Blood Loss.

The Patient Was Initially Managed Conservatively with Serial Physical Examinations, Monitoring of the Hematocrit, Serial Imaging Studies, and Discontinuation of Anticoagulation, But the Pain and Anuria Persisted. Repeat Computed Tomography 15 Days after Admission Showed That the Hematoma Had Expanded, and She Now Had Hydronephrosis on the Right Side as Well, Requiring Urologic Intervention with Bilateral Nephrostomy Tube Placement.

The Size of the Hematoma Was Evaluated with Serial Abdominal and Pelvic Examinations. After Several Days, Her Urine Output Had Improved, the Nephrostomy Tubes Were Removed, and She Was Discharged.

**Rectus Sheath Hematoma**

Our Patient Had a Giant Pelvic Hematoma, Probably Arising from the Rectus Sheath. This Uncommon Problem Can Arise from Trauma, Anticoagulation, or Increased Intra-Abdominal Pressure, But It Can Also Occur Spontaneously.¹

In Rectus Sheath Hematoma, a Branch of the Inferior Epigastric Artery Is Injured at Its Insertion into the Rectus Abdominis Muscle. Symptoms Arise If Bleeding Does Not Stop

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**Figure 1.** Abdominal computed tomography revealed a hematoma 15 cm × 15 cm within the paracolic gutter and pelvis, causing bladder compression and left-sided hydronephrosis.
spontaneously from a tamponade effect.\(^2\)

We speculate that in our patient, deep injection of enoxaparin into the abdominal wall injured the inferior epigastric artery, which started the hematoma, and the bleeding was exacerbated by the anticoagulation effect of the enoxaparin.

Another form of pelvic hematoma is retroperitoneal. It is most commonly caused by trauma but can occur due to rupture of the aorta, compression from tumors, or, infrequently, anticoagulation therapy.\(^3\)

**The role of anticoagulation**

Spontaneous pelvic hematoma is usually missed as a cause of abdominal pain in patients on anticoagulation therapy and is mistaken for common acute conditions such as ulcer, diverticulitis, appendicitis, ovarian cyst torsion, and tumor.\(^4\) It usually develops within 5 days of starting anticoagulation therapy. Symptoms vary depending on the location of the hematoma and are best diagnosed with abdominal computed tomography, with sensitivity as high as 100%.

**REFERENCES**

1. Cherry WB, Mueller PS. Rectus sheath hematoma: review of 126 cases at a single institution. Medicine (Baltimore) 2006; 85(2):105–110. doi:10.1097/01.md.0000216818.13067.5a
2. Hatjipetrou A, Anyfantakis D, Kastanakis M. Rectus sheath hematoma: a review of the literature. Int J Surg 2015; 13:267–271. doi:10.1016/j.ijsu.2014.12.015
3. Haq MM, Taimur SDM, Khan SR, Rahman MA. Retroperitoneal hematoma following enoxaparin treatment in an elderly woman—a case report. Cardiovasc J 2010; 3(1):94–97. doi:10.3329/cardio.v3i1.6434
4. Luhmann A, Williams EV. Rectus sheath hematoma: a series of unfortunate events. World J Surg 2006; 30(11):2050–2055. doi:10.1007/s00268-005-0702-9
5. Pace F, Colombo GM, Del Vecchio LR, et al. Low molecular weight heparin and fatal spontaneous extraperitoneal hematoma in the elderly. Geriatr Gerontol Int 2012; 12(1):172–174. doi:10.1111/j.1447-0594.2011.00742.x
6. Velicki L, Cemerlic-Adic N, Bogdanovic D, Mrdanin T. Rectus sheath haematoma: enoxaparin-related complication. Acta Clin Belg 2013; 68(2):147–149. doi:10.2143/ACB.68.2.3213
7. Sheth HS, Kumar R, DiNella J, Janov C, Kaldas H, Smith RE. Evaluation of risk factors for rectus sheath hematoma. Clin Appl Thromb Hemost 2016; 22(3):292–296. doi:10.1177/1076029614553024

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