

Enoxaparine-related Internal Oblique Muscle Hematoma in a Patient with Renal Insufficiency

Böbrek Fonksiyon Bozukluğu Olan bir Hastada Enoksaparinle İlişkili İnternal Oblik Kası Hematomu

ABSTRACT

Low-molecular-weight heparins (LMWHs) are increasingly being used in thromboembolic settings due to some advantages over unfractionated heparin. However, these beneficial effects may transform into potentially hazardous effects in patients with impaired renal function if standard doses are used. Inappropriately high-doses may lead to hematomas. Enoxaparine is the first and most extensively studied LMWH. The most frequently encountered hematomas related with enoxaparine occur at the rectus sheath and retroperitoneum. Lateral abdominal wall hematomas related with enoxaparine use have rarely been reported to date. We report an internal oblique muscle hematoma in a patient with moderate renal insufficiency despite adequate dose reduction and suggest some take-home points to prevent or treat hematoma complications.

KEY WORDS: Enoxaparine, Hematoma, Internal Oblique Muscle, Renal Insufficiency

ÖZ

Düşük Molekül Ağırlıklı Heparinler (DMAH) standart heparine kıyasla bazı avantajlarının olması nedeniyle tromboembolik durumlarda sıklıkla kullanılmaya başlanmışlardır. Bununla birlikte, böbrek fonksiyonu bozuk hastalarda özellikle standart dozlarda kullanılırsa bu faydalı etkiler potansiyel olarak zararlı etkilere dönüşebilir. Uygun olmayan yüksek dozlar hematoma gelişimine yol açabilirler. Enoksaparin ilk ve en yaygın olarak kullanılan DMAH'dir. Enoksaparin ile ilişkili hematomlar en sık olarak rektus kılıfında ve retroperitoneumda oluşurlar. Enoksaparin kullanımı ile ilişkili lateral karın duvarı hematomları günümüze kadar literatürde seyrek olarak bildirilmiştir. Biz burada uygun doz azaltımına rağmen enoksaparin kullanımı sonucunda orta derecede böbrek fonksiyon bozukluğu olan bir hastada gelişen internal oblik kası hematomunu bildirmekte ve hematoma komplikasyonlarının önlenmesi ve tedavisinde bazı pratik noktalara değinmekteyiz.

ANAHTAR SÖZCÜKLER: Enoksaparin, Hematom, İnternal Oblik Kası, Böbrek yetmezliği

Yalçın SOLAK¹
Hüseyin ATALAY¹
İlker POLAT²
Mehdi YEKSAN¹

1 Selçuk University
Meram School of Medicine,
Department of Nephrology,
Konya, Turkey

2 Selçuk University
Meram School of Medicine,
Department of Internal Medicine,
Konya, Turkey

INTRODUCTION

Low-molecular-weight heparins (LMWHs) are increasingly being used in thromboembolic settings due to ease of use, no requirement for monitoring their anticoagulant effect and have as sufficient efficiency as unfractionated heparin(UFH)(1). However, in patients with renal insufficiency, these beneficial effects may transform into potentially hazardous effects if one does not take into account the reduced creatinine clearance and other high risk features for bleeding. Inappropriately high doses may lead to hematomas in different body locations (2). Lateral abdominal wall hematomas have rarely been

reported to date. We report a case in which despite adequate dose-reduction, an internal oblique muscle hematoma developed associated with enoxaparine and we suggest some take-home points for practicing physicians.

CASE REPORT

A 78-year-old-male patient was admitted to be evaluated for increased urea and creatinine. He had coronary artery disease and had undergone coronary artery bypass surgery 6 months prior to current admission. He also had hypertension and benign prostatic hyperplasia and had been hospitalized 2 months earlier for acute kidney injury and

Received: 03.05.2010

Accepted: 11.08.2010

Correspondence Address:

Yalçın SOLAK
Selçuk Üniversitesi Meram Tıp Fakültesi,
Nefroloji, Konya, Turkey
Gsm : +90 505 889 98 85
E-mail : yalcinsolak@gmail.com

had been discharged with normal creatinine after adequate hydration.

At this last admission, initial laboratory values were as follows; blood urea: 44 mg/dl, creatinine: 1.6 mg/dl, sodium: 133 mEq/L, potassium: 3.39 mEq/L, calcium: 7.9 mg/dl, phosphorus: 4.5 mg/dl, albumin: 2.2 g/dl, hemoglobin: 10.6 g/dl, WBC: 15700/mm³, platelets: 519.000/mm³. Urine microscopy showed WBC: 11/HPF, RBC: 5/HPF.

On physical examination, the blood pressure was 140/80 mmHg, there were crackles at both lung bases, heart rate was regular at 76 beat/minute, and there were no murmurs or neck vein distention. He had bilateral 2+ pedal edema. The abdomen was soft, nontender and there was no organomegaly. He was on amlodipin 10 mg/day and ramipril 5 mg/day. He was placed on antibiotic treatment with an initial diagnosis of urinary tract infection. Ramipril was stopped due to acute increase in creatinine. We administered frusemide and monitored his daily weight. On the 6th day of admission, he developed shortness of breath. Thoracic computed tomography (CT) showed a pulmonary embolus. We commenced enoxaparine 0.4 ml (40 mg) bid subcutaneously. Drug dose was adjusted according to creatinine clearance and body-weight. The serum creatinine at that time was 1.9 mg/dl and creatinine clearance was 34 ml/min/1.7 m². On the 10th day of the treatment with enoxaparine, the patient complained of severe left lower abdominal pain. There was bruising over the painful area. There was a 2 gr/dl drop in the hemoglobin level but the patient was not hypotensive. Ultrasonography showed an abdominal-wall hematoma. We administered packed red blood cell (RBC) transfusion and stopped enoxaparine. The hematoma remained limited with

these supportive measures. Abdominal MRI showed an 18-cm-long hematoma lying between the external and internal oblique muscles on the left lateral abdominal wall (Figure 1,2)

DISCUSSION

LMWHs are a more homogenous form of UFH. This molecular difference gives them some advantages over UFH, which include a longer elimination half-life, a lower incidence of heparin-induced thrombocytopenia and a more predictable anticoagulant effect that reduces the need for routine laboratory monitoring (1).

The elimination half-life of all LMWHs is significantly prolonged in renal failure. The use of unadjusted doses of LMWH as to body-weight and renal function has therefore led to significant bleeding complications (3). Manufacturers of LMWHs recommend dose reductions or avoidance of these agents in severe renal failure. Nephrologists may feel more comfortable with UFH due to extensive and relatively safe track of use in maintenance hemodialysis patients. However, this does not necessarily mean that there is more bleeding with use of LMWHs than UFH. Patients with creatinine clearance ≤ 30 ml/minute in a study had considerably more bleeding complications than those with normal renal function regardless of whether LMWHs or UFH were used (4).

Besides practical advantages, some disadvantages of LMWHs start to appear when they are used in patients with renal insufficiency; firstly, their half-lives are considerably prolonged. Secondly, their anticoagulant effects cannot be fully reversed unlike the case with UFH. In a recent meta-analysis (5), standard, weight-adjusted enoxaparine was associated with a 2 to

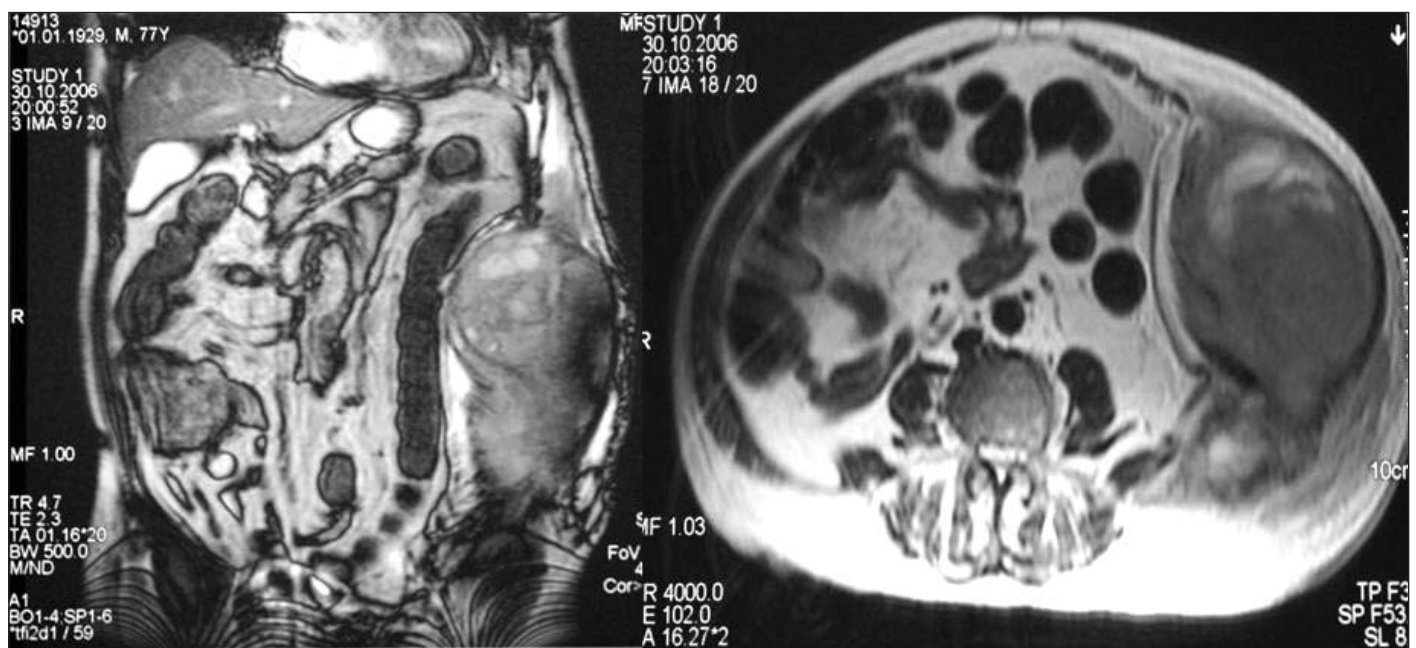


Figure 1. Coronal and transverse section of abdominal magnetic resonance imaging which depicts an 18-cm-long left-sided hematoma around the internal oblique muscle, depressing the internal oblique muscle medially.

3- fold increased risk for major bleeding events in patients with severe renal insufficiency (creatinine clearance below 30 mL/min) versus patients without renal insufficiency. Enoxaparine is the first and most extensively studied member of the LMWHs. Numerous bleeding complications have been described even in patients with normal renal function (3).

Bleeding and consequent hematoma formation may be at various locations. The most frequent regions are the retroperitoneum (7) and rectus sheath (6). Spinal, psoas and lateral abdominal wall hematomas are rarely seen (8). Some risk factors are associated with these hematoma formations under enoxaparine treatment, i.e., impaired renal function, low bodyweight, concomitant use of other anticoagulants, older age, increased abdominal pressure resulting from coughing, pregnancy and direct subcutaneous injection of enoxaparine in cachectic patients (6,9). Lateral abdominal wall hematomas are relatively rare occurrences (10). They usually develop around internal or external oblique muscles as in our case.

Some take-home points arise from our case; first, we should be well aware of the risk factors for bleeding. The enoxaparine dose should be reduced if one or more risk factors are present. The enoxaparine dose must be reduced in half particularly should the glomerular filtration rate be reduced to below 30 ml/minute. we experienced a hematoma in our case although we reduced the dose appropriately. Secondly, hematoma formation causes some signs and symptoms such as sudden onset of pain in the abdomen or flank, bruising, unexplained hypotension and a drop in the hemoglobin level. It is of utmost importance to discern these symptom and signs early to take measures to limit the hematoma expansion. Thirdly, if a suspicion of hematoma arises, the first measure is to stop enoxaparine along with other anticoagulant and antithrombotic medications and implement imaging studies, preferentially ultrasound, to confirm the diagnosis promptly. CT scan can be ordered to better visualize the regions that are difficult to visualize with ultrasound. Lastly, pharmacological measures can be tried; protamine sulphate cannot fully reverse the anticoagulant effects of LMWHs but can be administered. Hemodialysis, desmopressin (DDAVP) and conjugated estrogen can be used to diminish the contribution of uremic coagulopathy if the patient is uremic. Crystalloid infusion and positive inotropic support should be started while packed RBCs are being prepared if the patient is hemodynamically unstable. In conclusion, our case illustrates a relatively rare presentation of a common occurrence; hematoma associated with use of LMWH in patients with renal insufficiency.

REFERENCES

1. Hetzel GR, Sucker C: The heparins: All a nephrologist should know. *Nephrol Dial Transplant* 2005; 20: 2036–2042
2. Busby LT, Weyman A, Rodgers GM: Excessive anticoagulation in patients with mild renal insufficiency receiving long-term therapeutic enoxaparin. *Am J Hematol* 2001; 67: 54–56
3. Gerlach AT, Pickworth KK, Seth SK, Tanna SB, Barnes JF: Enoxaparin and bleeding complications: A review in patients with and without renal insufficiency. *Pharmacotherapy* 2000; 20: 771–775
4. Spinler SA, Inverso SM, Cohen M, Goodman SG, Stringer KA, Antman EM: Safety and efficacy of unfractionated heparin versus enoxaparin in patients who are obese and patients with severe renal impairment: analysis from the ESSENCE and TIMI 11B studies. *Am Heart J* 2003; 146: 33–41
5. Lim W, Dentali F, Crowther MA: Meta-analysis: Low-molecular-weight heparin and bleeding in patients with severe renal insufficiency. *Ann Intern Med* 2006; 144: 673–684
6. Rajagopal AS, Shinkfield M, Voight S, Hamdan K: Massive rectus sheath hematoma. *Am J Surg* 2006; 191: 126–127
7. López-Sánchez M, González-Fernandez C, Valero-Díaz de Lamadrid C, Domínguez- Artiga MJ, Hernández-Hernández MA: Enoxaparin, retroperitoneal haematoma in the elderly and impaired renal function. *Anaesth Intensive Care* 2005; 33: 689–690
8. Forsnes E, Occhino A, Acosta R: Spontaneous spinal epidural hematoma in pregnancy associated with using low molecular weight heparin. *Obstet Gynecol* 2009; 113: 532–533
9. 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: 1246–1248
10. Nakayama T, Ishibashi T, Eguchi D, Yamada K, Tsurumaru D, Sakamoto K, Hidaka H, Masuda H: Spontaneous internal oblique hematoma successfully treated by transcatheter arterial embolization. *Radiat Med* 2008; 26: 446–449