

CASE REPORT

Extensive Rectus Sheath Hematoma Secondary to Erroneous Technique of Anticoagulant Injection

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ABSTRAK

Pendarahan di dalam lapisan rektus yang dikaitkan dengan suntikan ubat pencair darah adalah merupakan kejadian yang jarang berlaku. Meskipun ubat cair darah terkini iaitu jenis Heparin Bermolekular Kecil (LMWH) dikatakan lebih selamat jika dibandingkan dengan ubat cair darah terdahulu, namun ia tetap mempunyai risiko pendarahan. Dengan peningkatan penggunaan LMWH yang disuntik sendiri oleh pesakit sama ada di dalam wad ataupun sebagai pesakit luar, ia memerlukan kempen kesedaran penjagaan kesihatan yang lebih tinggi di kalangan penyedia penjagaan kesihatan, pesakit dan penjaga mengenai kemungkinan risiko dan pengenalpastian komplikasi yang boleh berlaku disebabkan prosedur tersebut. Di sini, kami membentangkan satu kes kematian seorang lelaki tua disebabkan pendarahan yang teruk di dalam lapisan rektus yang berlaku akibat teknik suntikan Dalteparin yang salah.

Kata kunci: antikoagulan, arteri epigastrik inferior, hematoma, lapisan rektus

ABSTRACT

Rectus sheath hematoma (RSH) is a rare clinical entity that has been associated with the use of injectable anticoagulant therapy. Although low molecular weight heparin (LMWH) was proven to have a better safety profile than its predecessor, it is not without its own risk of bleeding. The increase in use of self-injectable LMWH in both in-patient as well as out-patient basis warrants greater awareness among health care providers, patients and caregivers regarding the potential risks and identification of possible complications. We present a fatal case of rectus sheath hematoma in an elderly man that occurred following erroneous technique

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of Dalteparin injection.

Keywords: anticoagulant, hematoma, inferior epigastric artery, rectus sheath

INTRODUCTION

Rectus sheath hematoma (RSH) is an uncommon clinical condition which involves hemorrhage within the rectus sheath (Donaldson et al. 2007). Clinical presentation is usually acute or sub-acute depending on the extent of hemorrhage. Classical symptoms include abdominal swelling and pain. RSH may take a turn for the worst in severe hemorrhagic conditions that lead to extension into the peritoneal cavity inadvertently causing hypovolemic shock (Alla et al. 2010). Delayed diagnosis and intervention could prove to be fatal. Several etiologies were implicated in giving rise to this rare clinical entity, namely conditions that cause increased intra-abdominal pressure such as severe bouts of cough or sneeze, weight lifting and prolonged labor. Direct abdominal trauma, elderly age, clotting disorders and more commonly the use of anticoagulant therapy has also been documented in cases of RSH (Alla et al 2010; Cherry et al., 2006).

We aim to highlight a fatal case of extensive RSH complicated by hypovolemic shock following use of Dalteparin injection in a 73-year-old man with previous history of deep vein thrombosis and pulmonary embolism.

CASE REPORT

A 73-year-old man presented to the

Emergency Department with a short history of severe abdominal pain and painful left abdominal wall swelling for the past 2 days following self-administered subcutaneous Dalteparin injection. On admission, the patient was mildly pale and hypotensive with poor urine output. His abdomen was tender in the left lower quadrant with a mild bluish discoloration of the overlying skin. His hemoglobin was 7g/dl with normal platelet levels but mildly prolonged INR and APTT. The abdominal radiograph showed a large hazy area in the left lower quadrant (Figure 1). A diagnosis of rectus sheath hematoma was considered and computed tomography (CT) scan of the abdomen planned. While



Figure 1: Encircled radio opaque area of the abdominal radiograph in supine position suggestive of rectus sheath hematoma.

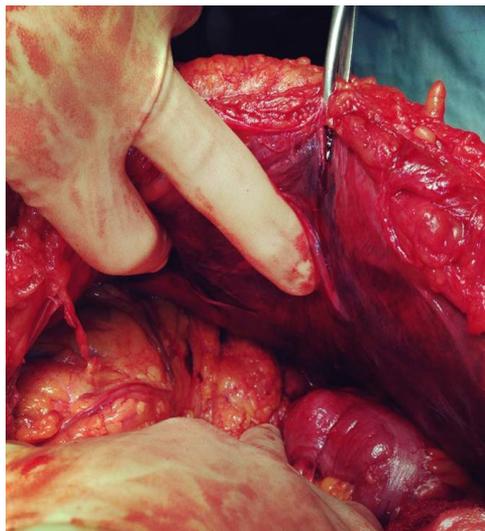


Figure 2: Intra-operative photograph shows bluish black stippling on the inner aspect of anterior abdominal wall which is characteristic of rectus sheath hematoma.

awaiting the CT scan, he was admitted to the ward, given resuscitated with intravenous fluids, given intravenous analgesia, blood and blood product transfusion as well as vitamin K. Within 30 minutes of ward admission, he became progressively hypotensive, anuric, tachycardic and complained of worsening abdominal pain. On review, he appeared to be more pale, with cold and clammy peripheries. The area of tenderness over the left lower abdomen had also increased. Emergency exploratory laparotomy was undertaken. Intraoperatively, a large left sided rectus sheath hematoma was noted on the underside of the anterior abdominal wall (Figure 2). The hematoma had ruptured through the peritoneal layer and into the peritoneal cavity. Clots were evacuated with no active bleeding point noted. During surgery, the patient sustained an unfortunate episode of myocardial

infarction but was successfully resuscitated by prompt recognition and timely administration of intravenous glycerine trinitrate (GTN). Streptokinase was withheld in view of the existing coagulopathic condition of the patient. Decision was made not to prolong surgery any further and Bogota bag was applied prior to being transferred to the intensive care unit. Post-operatively, he required inotropic support and ongoing blood as well as blood product transfusion to correct the anemia and coagulopathy. A relook laparotomy was performed 24 hours later which ruled out any ongoing intra-abdominal bleed. Formal closure of his abdominal wall was achieved in the same setting. Five days later, despite not on sedation, his Glasgow Coma Scale remained unfazed at E1V(T)M1. Two weeks later, he was declared brain dead and was removed from cardiopulmonary support.

Retrospective review of his past medical history revealed a long standing history of alcoholic liver disease with associated esophageal varices, recurrent deep vein thromboses complicated by previous episode of acute pulmonary embolism, chronic obstructive pulmonary disease with an exercise tolerance of 5 yards, chronic kidney disease stage III, and colonic diverticular disease. He was previously on warfarin as preventative therapy for thrombosis but was switched to daily subcutaneous Dalteparin injections (12,500 units) following a recent upper gastro-intestinal bleed (UGIB) 4 weeks earlier. He had poor social support, lived in a shelter and had been self-

Table 1: CT classification of rectus sheath hematoma proposed by Berna et al. 2000

GRADE I	Mild RSH that is intramuscular, unilateral, and does not dissect along fascia adjacent to the rectus muscle.
GRADE II	Moderate RSH that is intramuscular, dissects along adjacent fascia and may involve bilateral rectus muscles but without extension into the prevesical space.
GRADE III	Severe RSH that dissects along the fascia and extends into the peritoneum and the prevesical space.

administering the anticoagulant injections. Wrongful introduction of the needle into the intramuscular plane instead of the subcutaneous plane could have injured the inferior epigastric artery. Disruption of vascular endothelium augmented by the anticoagulant effect of the administered drug was most likely to have precipitated such an extensive RSH in this case.

DISCUSSION

Rectus sheath hematoma is an uncommon cause of acute abdominal pain and is often misdiagnosed due to low index of suspicion especially in patients with thick abdominal wall (Donaldson et al. 2007). It results from rupture of the epigastric vessels either due to erroneous method of drug administration, direct trauma or iatrogenic injury during surgery. Symptoms are largely non-specific and include abdominal pain, abdominal swelling, fever as well as vomiting. Physical findings may include the presence of a non-pulsatile mass over the lower abdominal regions with or without ecchymosis of the overlying skin. There are reports of it mimicking an acute abdomen leading to unnecessary laparotomies with increased risk of morbidity and

mortality (Alla et al. 2010; Cherry et al. 2006). Positive Fothergill's sign refers to a tender abdominal mass that does not cross the midline and remains palpable on tensing the rectus muscles. It is highly suggestive of rectus sheath hematoma (Karabulut et al. 2006). Although patients presenting with RSH are hemodynamically stable in most cases, RSH is associated with a 4% risk of mortality which increases drastically to 25% in anticoagulated patients (Donaldson et al. 2007; Berna et al. 2000; Osinbowale et al. 2008).

Plain abdominal radiographs do not play a significant role in accurate diagnosis of RSH but may exclude other pathology such as intestinal obstruction or pneumoperitoneum. Interestingly in this case, the hematoma was seen as a large hazy area in the left iliac fossa as well as left lumbar region on the abdominal radiograph. Tenderness caused by the ultrasound probe and the limiting factor of inter-observer variability in trans-abdominal ultrasonography makes CT a more superior diagnostic tool. The CT classification of RSH can be applied to guide management of RSH in patients who are hemodynamically stable (Table I) (Berna et al., 2000).

Treatment options vary depending on hematoma extent and clinical picture. Active bleeding can be managed as

in this case by surgical evacuation of the hematoma and ligation of bleeding vessels, or radiologically with catheter embolization (Osinbowale et al. 2008). Anticoagulation therapy is a well-recognized cause of rectus sheath hematoma. A study by Sobkin et al. illustrated that 15 out of 20 cases of reported IEA injury at his center were iatrogenic in nature and occurred either during paracentesis, laparoscopy or secondary to faulty technique of LMWH injection. Almost 80% of this subgroup were also coagulopathic at the time of diagnosis (Sobkin et al. 2008).

Researchers examined 50 cadavers to map the course of IEA (Rao et al. 2013). The study concluded that there were notable variations in length of the IEA among the cadavers and no uniformity of entry of the IEA into the rectus muscle. More clinically relevant is that the IEAs are situated around 4-8 cm from the midline on either side, which means that the safe zone for injection or insertion of laparoscopic trocars should theoretically lie on either side of this arterial zone, on the lateral one third of the line adjoining the midline and the anterior superior iliac spine. Due to anatomical variation this may not always hold true but remains an important guide for arterial mapping before any invasive procedures.

CONCLUSION

This case highlights the importance of early recognition of a rare complication following erroneous technique of administering an injectable anticoagulant. Patient and caregivers

must be equipped with the know-how prior to being allowed to self-administer or assist in administering the drug at home. Early identification and prompt diagnosis can mean the difference between life and death.

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