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Research article

Traumatic inferior epigastric vessel haemorrhage

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ABSTRACT

Inferior epigastric vessel (IEV) bleeding usually results in a localised rectus sheath haematoma. This condition was thought to be uncommon and sometimes overlooked or misdiagnosed. Lately the condition has become more prevalent with life threatening bleeding which may need emergency intervention to save life. A case report of IEV bleeding following trauma in a 17-year-old male is reported. A CT scan enabled localisation of the injury site and showed signs of active bleeding. Facilities for embolization didn't exist in the hospital at the time. The bleeding was life threatening which required an emergency laparotomy.

The laparotomy confirmed the source of the bleeding as the left IEV. The offending vessel was ligated and the haematoma was evacuated. The patient recovered well and his life was saved. Bleeding from the IEV is thought to be rare and the result is usually a haematoma which can be treated conservatively. The presentation is changing and there is an increase in severity and frequency of the bleeding which can endanger life. If facilities for embolization do exist, a minimally invasive procedure is the method of choice. If on the other hand they don't exist, which is the case in many hospitals; laparotomy should be performed where there is a threat to life.

Keywords: inferior epigastric vessels, rectus sheath haematoma

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INTRODUCTION

Bleeding from inferior epigastric vessels (IEV) is usually confined within the rectus sheath and the result is a localised haematoma. Below the arcuate ligament the posterior sheath is lacking and the vessels lie loosely attached on the dorsal surface of the rectus muscle, separated from the peritoneal cavity by transversalis fascia and peritoneum.

Branches of the vessels pierce the muscle and are firmly attached. This discrepancy between fixed branching and loose attachment makes the vessels vulnerable to shearing stresses during strong muscle contraction. Major bleeding can happen in this vicinity and can threaten life.

CASE REPORT

This report describes an injury sustained by a 17-year-old male, motorcyclist, who came off his motorbike at high velocity, estimated to be about 70 mph in a residential area. There were no other vehicles involved. On admission to the accident and emergency department (A&E) he had a full assessment. His Glasgow Coma Scale was 15 and he was initially haemodynamically stable. Clinically there were no head, neck, or chest signs of injuries. Abdominal examination revealed tenderness but no bruising or masses to suggest bleeding. All the trauma X-ray films were satisfactory. The right leg and foot examination revealed compound fracture of the right tibial diaphysis with a crushed right foot.

All blood tests were normal except low haemoglobin. An urgent abdominal and pelvic ultrasound scan was performed as per trauma protocol, which showed a large pelvic haematoma extending into the upper abdomen with normal liver, gallbladder, kidneys and spleen, and no intraperitoneal fluid. Subsequently, a CT scan was done to ascertain the diagnosis and provide more information about the abdominal organs. It revealed evidence of an extraperitoneal haematoma, active bleeding, as well as intraperitoneal collection (Figure 1). This coronal image showed extraperitoneal free fluid inferior to small bowel loops extending to the left iliac fossa with deviation of the bowel to the right. While in A&E, he became increasingly tachycardic and hypotensive. An emergency laparotomy was decided due to lack of angiographic facilities.

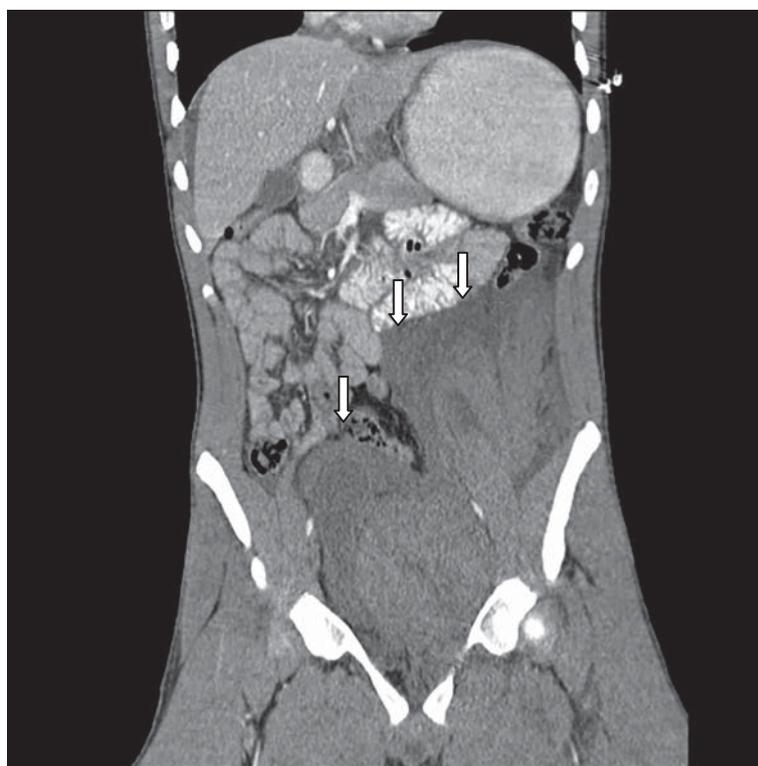


Figure 1. Enhanced CT shows extraperitoneal haematoma (below arrows).

The right lower limb assessment revealed an extensive injury of the posterior tibial artery and tibial nerve. There was degloving of the right foot with severe crush injury. It was deemed non-reconstructable hence, consent for laparotomy and right below knee amputation was obtained.

The laparotomy revealed massive extraperitoneal bleeding that was below the patient's left rectus muscle with an actively bleeding left IEV (Figure 2). The bleeding vessel was identified and ligated. The evacuated haematoma was estimated to be at least three litres of blood. One litre of serum was recovered from the intraperitoneal space, though there was no intra-abdominal organ injury. Following that, below knee amputation was fashioned. In total, he received 12 units of blood.

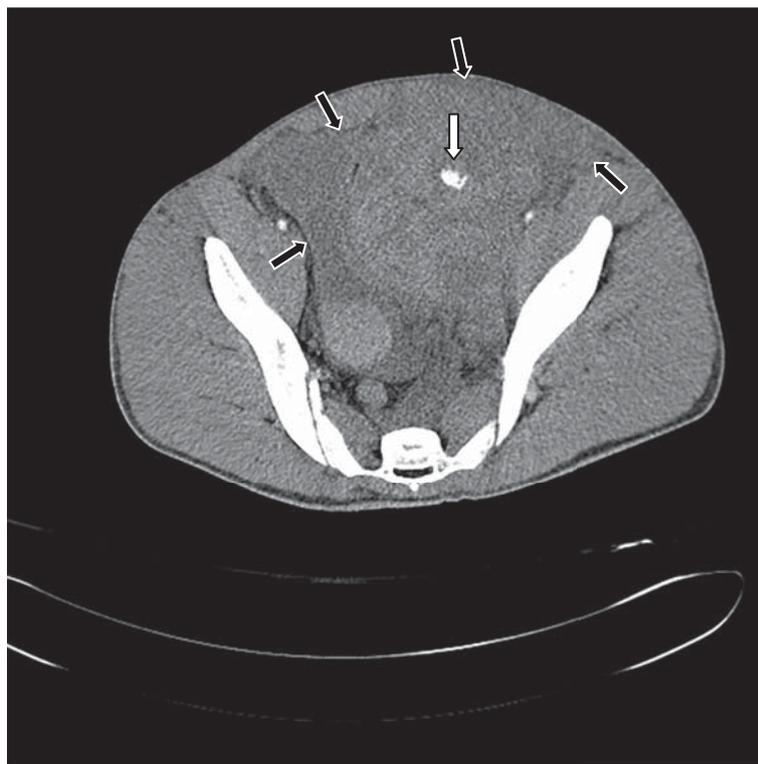


Figure 2. Axial CT scan demonstrating active bleeding (white arrow).

Following the surgery, the blood pressure stabilized satisfactorily. Postoperatively, he was admitted to the intensive care unit for overnight ventilation and monitoring. He remained stable from the ventilatory and circulatory standpoint and was subsequently weaned from mechanical ventilation the following morning. The rest of his postoperative course was uneventful.

DISCUSSION

Spontaneous or traumatic rupture of IEV and its branches commonly produce rectus sheath haematoma (RSH). RSH is thought to be uncommon. It may present with abdominal pain and a palpable tender abdominal mass. A history of excessive physical exertion and muscular strains such as coughing, minor trauma, sneezing and twisting may precede the onset of symptoms¹.

The literature reflects the predominance of elderly patients among those affected². Females are more susceptible than males¹. The swelling is normally confined to the abdominal wall and bruising may be visible in the overlying skin. Fothergill's sign or Carnett's sign can help to identify swelling or pain in the anterior abdominal wall and differentiate it from other intra-abdominal pathologies. Anticoagulation has been described as an important causative factor. Reversal of anticoagulation and/or antiplatelet therapy should be carried out with expert advice from a haematologist.

RSH can be caused by other conditions apart from trauma such as coagulation disorders³, cardiac catheterization⁴, subcutaneous injections to the abdominal wall, percutaneous drain placement, postpartum haemorrhage after caesarean delivery⁵, as an atypical source of bleeding in pelvic fractures⁶, laparoscopic injury of abdominal wall blood vessels⁷, and secondary to yoga and laughter sessions⁸, though it can develop spontaneously⁹. However, definitive clinical features are variably present hence sigmoid diverticulitis¹⁰ or often appendicitis can be suspected especially if it is not palpable¹¹. Therefore, historically some of the patients with RSH have been treated with operative

procedures because it can mimic other acute abdominal disorders. RSH in the case of pregnant patients can be mistaken for obstetric and gynaecological complications such as abruptio placentae¹² and ovarian torsion¹³.

Recently with the increasing usage of imaging notably CT scan, the errors of diagnoses have been markedly reduced. Unnecessary exploratory surgery which may exacerbate RSH by relieving the natural tamponade provided by the rectus sheath, with subsequent uncontrolled haemorrhage is no longer a concern. More cases of rectus sheath haematomas are being diagnosed recently as the pattern is changing with more use of heparin and more use and availability of scans¹⁴.

Severe trauma such as what happened to our patient can produce massive bleeding. In such cases of trauma, the suspicion of a bleeding source is usually the chest, abdomen, pelvis or external. For trauma patients, the question is where the bleeding is. The young age of our patient, the severe trauma and massive haematoma makes our case very unique. Contrary to ordinary trauma cases, the bleeding was in the abdominal wall.

Once the diagnosis of RSH is confirmed (by CT or US scan) the majority of these patients can be treated conservatively¹⁵. The sensitivity rate of CT is 100 percent while ultrasound is 71 percent. The management consists of withdrawal of anticoagulation therapy, correction of the coagulation status, volume resuscitation and supportive measures such as analgesia and rest. In the event of failure of conservative management or development of hypovolemic shock and when signs of localizing active bleeding are present on CT, angiographic evaluation is helpful for localization and treatment via percutaneous embolization¹⁶. Access to appropriately trained interventional radiologists and equipment may limit the uptake of this modality.

Surgical intervention should be considered in hemodynamic instability, where embolization facilities do not exist or are not readily available. Surgical evacuation of the haematoma is performed, with ligation of the bleeding vessel. In trauma cases, there is an advantage of exploring the abdomen and excluding intra-abdominal pathology especially where there is fluid collection. Rarely can this condition be fatal, hence risk factors such as old age, female sex, and anticoagulation should be considered in the management¹.

CONCLUSION

Inferior epigastric bleeding resulting from trauma requires all the management modalities to be readily available. When embolization facilities exist, it should be the first choice otherwise surgical intervention is advised. It is important in abdominal trauma cases to remember that bleeding can be in the abdominal wall. CT scan remains the modality of choice for investigation as it can diagnose and help in further management. The increasing use of anticoagulation and antiplatelet therapies resulted in an increase in RSH incidence.

COMPETING INTEREST

The authors of this study declare no competing interest.

AUTHORS' CONTRIBUTIONS

All authors have contributed to this study and participated in drafting or revising the manuscript. They all read and approved the final manuscript.

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