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Case Report

Massive haemorrhage from the internal iliac artery following a low energy superior pubic ramus fracture in a 73-year-old man

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ABSTRACT

We report a case of a 73-year-old man with a background of aspirin use who fell and sustained a minimally displaced right superior pubic ramus fracture. He subsequently developed hypotension that necessitated fluid resuscitation, associated with a significant drop in blood haemoglobin levels that required a packed red blood cell transfusion. CT scans revealed the presence of two pelvic haematomas, with ongoing bleeding. An angiogram demonstrated bleeding from the superior vesical branch of the anterior division of the right internal iliac artery, which was successfully embolised with gelfoam slurry. The patient recovered uneventfully thereafter. This is a unique case involving an unexpected injury to the superior vesical branch of the anterior division of the internal iliac artery following low energy trauma to an elderly man. We recommend that patients who develop hypotension following a seemingly-benign isolated pubic ramus fracture be evaluated for concomitant arterial injuries with the relevant CT imaging and angiography.

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1. Introduction

Massive haemorrhage from pelvic fractures due to disruption of pelvic vessels is a common complication in high-energy trauma. Disruption to the anterior division of the internal iliac artery following pubic rami fractures, however, has not been commonly reported.^{1,2}

2. Case report

A 73-year-old Chinese gentleman presented to the Emergency Department following a simple fall onto his right hip while

walking to the toilet. Subsequently, he was unable to bear weight on his right lower limb. He also complained of lower abdominal pain. Notably, he had a past history of stroke and was on aspirin at a dosage of 100 mg daily for secondary prophylaxis.

On examination, he had a blood pressure of 146/63 mm Hg, heart rate of 60/min, and his oxygen saturation was 97% on room air. He had full range of movements in both hips, albeit with some tenderness over the right groin. The neurovascular examination of the lower limbs was unremarkable. The abdomen was soft and there was no guarding or rebound tenderness.

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Fig. 1 – Minimally displaced right superior pubic ramus fracture (arrow).

The pelvic X-rays revealed a fracture of the right superior pubic ramus with no significant displacement (Fig. 1). Approximately an hour after the admission to the Emergency Department, the patient's blood pressure dropped to 62/36 mm Hg, which responded to a fluid challenge with 1 L of crystalloid solution. The patient was then admitted to the ward after his blood pressure had stabilized.

A CT scan of the abdomen and pelvis was ordered, which showed two pelvic haematomas – a $7.0 \times 6.2 \times 6.4$ cm haematoma was in the left hemi-pelvis posterior to the superior pubic rami, and another $14.9 \times 15.2 \times 5.6$ cm haematoma lay just deep to the lower anterior abdominal wall but anterior to the bladder (Fig. 2). In addition, some contrast extravasation was noted posterior to the pubic symphysis, indicating active bleeding (Fig. 3). There were no posterior pelvic injuries detected. Notably, the patient's haemoglobin level dropped from 11.4 g/dL in the Emergency Department to 8.9 g/dL after admission to the ward 4 h later, and he was transfused with 2 units of packed red blood cells.

A referral to Interventional Radiology was made and he underwent emergency angiography. An angiogram was done

Fig. 3 – Contrast extravasation deep to pubic symphysis (arrow).

and selective catheterization of the right internal iliac artery demonstrated distal blushes over the pubic region arising from the superior vesical branch of the anterior division of the right internal iliac artery (Fig. 4). This was selectively cannulated with a microcatheter and embolised with gelfoam slurry. A completion angiogram showed no further contrast extravasation.

The patient's condition subsequently stabilized and he was discharged to a step-down facility for functional rehabilitation soon after.

3. Discussion

High-energy pelvic fractures (Young & Burgess types: anteroposterior compression II & III, lateral compression type II &

Fig. 2 – Pelvic and superficial abdominal haematomas (arrows).

Fig. 4 – Angiography showing a blush at a branch of the anterior division of the internal iliac artery.

III, vertical shear, and combined mechanical injury^{3,4}) are often associated with concomitant vascular injuries. The commonly affected vessels, due to their anatomical location, are the superior gluteal and internal pudendal arteries (both arising from the internal iliac artery).^{3,5–7}

On the other hand, low energy trauma to the pelvis causing arterial injury and massive haemorrhage has not been commonly reported in the literature.^{1,2,8–12} Our literature review on arterial haemorrhage secondary to pubic rami fractures found only a handful of case reports describing this unusual phenomenon.

Injury to the inferior epigastric artery, a branch of the external iliac artery (EIA), was frequently found to be the culprit in patients presenting with shock after sustaining pubic rami fractures.^{1,8–12} The corona mortis, which is a communication between the external iliac and obturator arteries, was the other oft-implicated vessel in published literature.^{13–17}

Notably, branches of the internal iliac artery (IIA) have seldom been implicated in pubic rami injuries. Obturator artery involvement has been described in a case report by Mouzopoulos et al involving a young man who had suffered a high-energy motor vehicle accident.¹⁸ The only other report of internal iliac artery injury was by Chiu et al, who described a middle-aged patient with bilateral superior and inferior pubic rami fractures after an accident involving a lorry.²

As such, the cases described to date involve injuries to the inferior epigastric artery (EIA), obturator artery (IIA), or the corona mortis anastomosis between the EIA and IIA. Our case is unique in that the arterial injury occurred at the most proximal superior vesical branch of the anterior division of the internal iliac artery following low energy trauma to an elderly man after he fell from standing height (Fig. 5). This, to our best knowledge, has not been previously described in the literature.

The authors would like to highlight that a likely risk factor in our patient was his long-term use of antiplatelet medication, which may predispose a patient to significant bleeding following seemingly minor injury. Anticoagulants and antiplatelet agents have only occasionally featured in case reports,^{1,2} but affected patients should be considered at high-risk and hence monitored closely.¹⁹

Fig. 5 – Line diagram showing common sites of injury to the main branches of the internal and external iliac arteries.

4. Conclusion

We conclude by recommending that patients who present to the Emergency Department with hypotension following a seemingly-benign isolated pubic ramus fracture be evaluated for concomitant arterial injuries. This would involve a CT scan of the abdomen and pelvis after the patient has been stabilized. In the presence of pelvic haematomas, an interventional radiologist should be enlisted to perform an angiogram and, if needed, arterial embolization.

Conflicts of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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