

Internal Iliac Artery Injury in a Fractured Pelvis

Mahmoud A. Wali, FRCSI, FACA

This is a case of an 8 year-old boy who suffered a severe road traffic accident (RTA) with multiple fractures of the pelvis and right femur together with rupture of the urethra. After initial stabilization, he presented one month later with a large pseudoaneurysm of the left internal iliac artery. The patient underwent successful laparotomy, evacuation of the hematoma and ligation of the injured internal iliac artery. (Ann Thorac Cardiovasc Surg 2003; 9: 337–9)

Key words: road traffic accident (RTA), fracture pelvis, internal iliac artery, pseudoaneurysm

Introduction

Most major iliac artery injuries are due to penetrating trauma. Intraoperatively, patients with iliac artery injuries present with active pelvic bleeding or with a retroperitoneal hematoma in the lateral aspect of the pelvis. Pelvic fractures associated with severe blunt trauma may cause disruption of multiple branches of the internal iliac arteries and veins. This may result in fatal hemorrhage and must always be kept in mind as a source of occult major bleeding. Management of an expanding pelvic hematoma is complex. The injured branch vessels can be extremely difficult to localize and to attempt this in the operating room may provoke rapidly fatal hemorrhage.¹⁾

In this paper, we are presenting our successful management of a case of an expanding pelvic hematoma due to internal iliac artery pseudoaneurysm caused by blunt trauma and fracture pelvis.

Case Report

This is an 8 year-old boy who was involved in a road traffic accident (RTA) with severe antero-posterior com-

pression injury to the pelvis, lower abdominal and upper thigh blunt trauma. On admission to a peripheral hospital, he had fractures of the right femur, right superior pubic ramus, left iliac bone and subluxation of the left sacroiliac joint. Ascending urethrogram showed rupture of the posterior urethra. Computed tomographic (CT) scan of the abdomen and pelvis showed large retropubic, retroperitoneal and perineal hematomas. There were no other notable abdominal or thoracic injuries. The patient received intravenous fluid and blood resuscitation. A suprapubic cystostomy catheter was inserted and skin traction for the fracture femur was done. The child had a good recovery with stable hemoglobin, clear urine and normal vital signs.

Twenty-eight days later, the child started to bleed profusely from the suprapubic cystostomy catheter with the appearance of a large perineal and lower abdominal swelling. His hemoglobin dropped. Urgent CT scan of the abdomen and pelvis showed a large hematoma occupying the left side of the pelvis and pushing the urinary bladder anteriorly and to the right (Fig. 1A). Sagittal reconstruction suspected an open injury of the left internal iliac artery (Fig. 1B). At this stage, the patient was referred to Asir Central Hospital in Abha for vascular surgery care. An emergency angiogram confirmed the diagnosis of a left internal iliac artery pseudoaneurysm (Fig. 1C). After fluid and blood resuscitation, the patient underwent an emergency laparotomy through a midline, transperitoneal approach. On exploration, there was a large pelvic hematoma cavity measuring 10×10×10 cm and containing about 450 g (900 ml) blood. The cavity dissected and

From Department of Surgery, Asir Central Hospital, and College of Medicine and Medical Sciences, King Khalid University, Abha, Saudi Arabia

Received April 17, 2003; accepted for publication May 22, 2003. Address reprint requests to Mahmoud A. Wali, FRCSI, FICS, FACA: Department of Surgery, College of Medicine and Medical Sciences, King Khalid University, P.O. Box 641, Abha, Saudi Arabia. mahmoudwali@yahoo.com

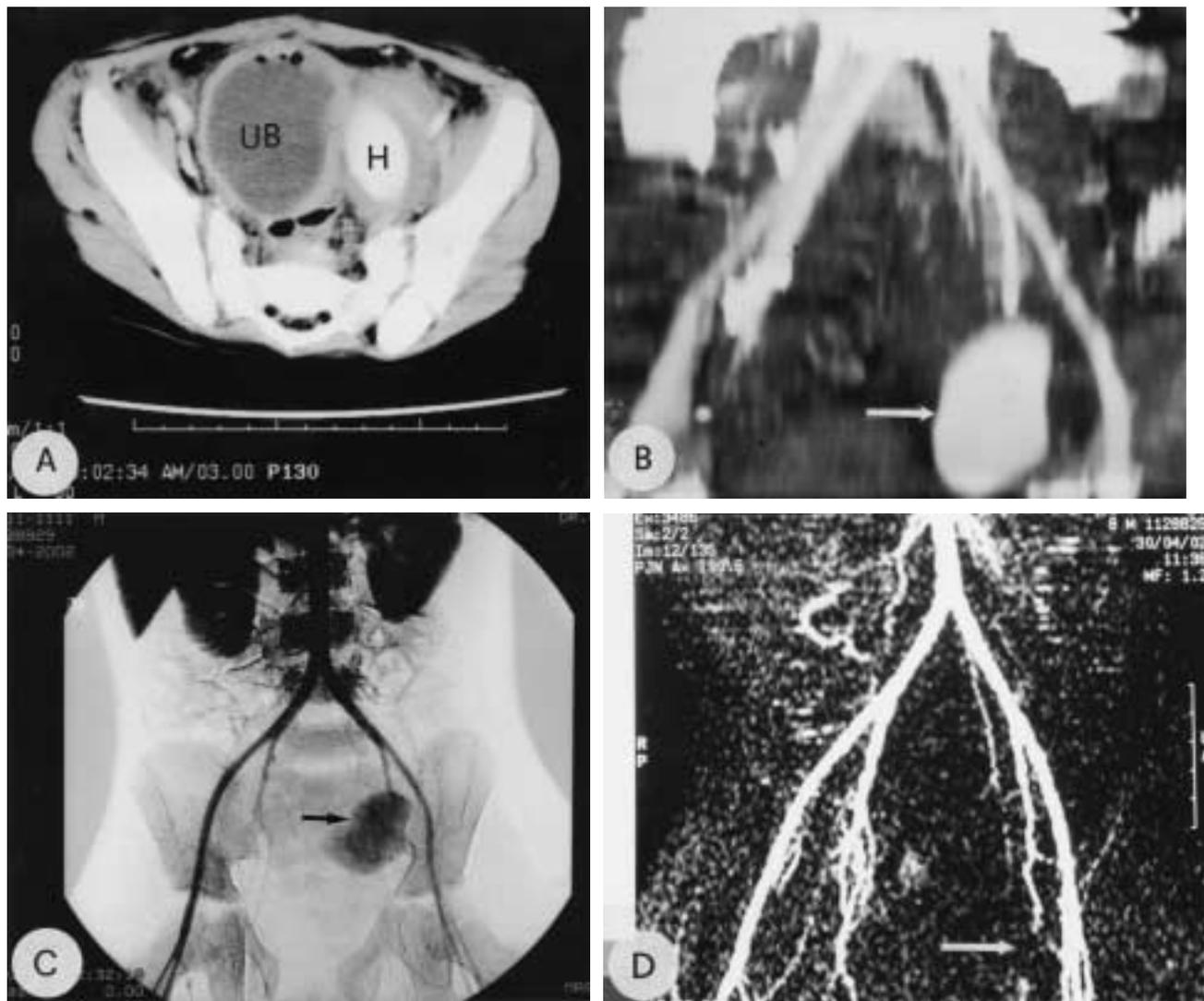


Fig. 1. A: CT scan of the pelvis (transverse cut) showing pelvic hematoma (H) in the left side, pushing the distended urinary bladder (UB) to the right. Note the clot inside the hematoma cavity (whitish).

B: Sagittal reconstruction of a pelvic CT scan, showing the contained extravasation along the course of the left internal iliac artery (arrow).

C: Aorto-iliac arteriogram showing the extravasation along the course of the left internal iliac artery (arrow).

D: Postoperative MRA showing the interrupted segment along the course of the left internal iliac artery (arrow).

pushed the urinary bladder anteriorly and to the right. After proximal aortic and distal external iliac artery control, a hole was identified on the anterior surface of the left internal iliac artery, 6 cm distal to the iliac bifurcation, which was bleeding into the pseudoaneurysmal cavity. The hematoma was evacuated and the injured internal iliac artery was transfixed-ligated. The patient did well postoperatively with smooth recovery, except for a wound infection which was managed with drainage and daily dressing.

Postoperative magnetic resonance angiography (MRA)

of the abdomen and pelvis showed disappearance of the aneurysmal cavity and good flow distal to the interrupted segment of the internal iliac artery (Fig. 1D). The patient remained well with no further problem, one year after the operation.

Discussion

If this is not the first reported case of internal iliac artery pseudoaneurysm in cases of fracture of the pelvis, it must be very rare. The result of our MEDLINE search for simi-

lar reported cases was as follows: 1) internal iliac artery pseudoaneurysm in fracture pelvis, 0 articles; 2) traumatic internal iliac artery pseudoaneurysm, 0 articles; 3) internal iliac artery pseudoaneurysm in children, 1 article; 4) internal iliac artery pseudoaneurysms, 8 articles; none of them related to blunt trauma or fracture of the pelvis.

Pseudoaneurysms may either involve the internal iliac artery itself,²⁻⁶⁾ or its superior or inferior gluteal branches.^{7,8)} There are different reported causes for this condition in the literature, but none were related to fracture of the pelvis. They include atherosclerosis or anastomotic leak following repair of the abdominal aortic aneurysm.²⁾ It was also reported following renal transplantation, in patients with advanced cervical or pelvic malignancy, or those with Marfan's syndrome.^{4,5,7)} Other causes include umbilical artery catheterization and transvaginal needle biopsy procedures.^{3,8)}

Patients may present with symptoms and signs of internal bleeding due to rupture of the pseudoaneurysmal cavity.²⁾ They may also present with low back and lower extremity pain and/or weakness due to compression on adjacent nerve roots, especially in cases of gluteal aneurysms.^{2,4,8)} Another rare presentation is lower gastrointestinal bleeding in cases of fistulous communication between the aneurysmal cavity and the sigmoid colon or rectum.⁵⁾

Use of appropriate investigations depend on the symptoms and signs on presentation. They include electromyography and nerve conduction studies,⁴⁾ CT scans, magnetic resonance imaging (MRI),⁸⁾ or preferably selective pelvic angiography.⁴⁾ In this case, we used the last three modalities. We used angiography for preoperative accurate diagnosis and localization and used MRA as an objective, non-invasive technique for postoperative evaluation.

The management of these patients depends on the size of the aneurysm, the presence of any compression symptoms and whether it had ruptured. Transcatheter embolotherapy by balloon occlusion or coil embolization has been practiced with great success.⁵⁻⁷⁾ Also, transcatheter placement of covered stents to exclude the aneurysmal cavity has been successfully used.²⁾ However,

in cases of rupture or presence of a large-size aneurysmal cavity, open surgery and ligation of the internal iliac artery would be preferable, as we did in this case.⁸⁾

Conclusion

Major internal iliac artery injury with pseudoaneurysm formation is very unusual especially after blunt trauma and fracture of the pelvis. Due to the rarity of the condition, a high index of suspicion and the early use of angiography are recommended.

References

1. Hood DB, Yellin AE, Weaver FA. Vascular trauma. In: Dean RH, Yao JST, Brewster DC eds.; Current Diagnosis and Treatment in Vascular Surgery. East Norwalk: Appleton & Lange, 1st ed. 1998; pp 415-6.
2. Cormier F, Al Ayoubi A, Laridon D, Melki JP, Fichelle JM, Cormier JM. Endovascular treatment of iliac aneurysms with covered stents. *Ann Vasc Surg* 2000; **14**: 561-6.
3. Shah V, Hellmann J, Chait P, Connolly B. Radiology casebook. Pseudoaneurysm of the right internal iliac artery after umbilical artery catheterization: case report and review of the literature. *J Perinatol* 2000; **20**: 392-6.
4. Luzzio CC, Waclawik AJ, Gallagher CL, Knechtle SJ. Iliac artery pseudoaneurysm following renal transplantation presenting as lumbosacral plexopathy. *Transplantation* 1999; **67**: 1077-8.
5. Spinosa DJ, Angle JF, McGraw JK, Maurer EJ, Hagspiel KD, Matsumoto AH. Transcatheter treatment of life-threatening lower gastrointestinal bleeding due to advanced pelvic malignancy. *Cardiovasc Intervent Radiol* 1998; **21**: 503-5.
6. Soulez G, Oliva VL, Therasse E, Provencher D. Embolization of a large-neck aneurysm of the internal iliac artery with interlocking detachable coils: case report. *Can Assoc Radiol J* 1998; **49**: 39-41.
7. Vasseur MA, Doisy VC, Prat AG, Stankowiak C. Coil embolization of a gluteal false aneurysm in a patient with Marfan syndrome. *J Vasc Surg* 1998; **27**: 177-9.
8. Papadopoulos SM, McGillicuddy JE, Messina LM. Pseudoaneurysm of the inferior gluteal artery presenting as sciatic nerve compression. *Neurosurgery* 1989; **24**: 926-8.