

Yahya ÜNLÜ
Ünsal VURAL
Sami KARAPOLAT
Münacettin CEVİZ
Hikmet KOÇAK

The Rupture of a Large Isolated Iliac Artery Aneurysm

Department of Cardiovascular Surgery, Faculty of Medicine, Atatürk University, Erzurum, Turkey

Received: February 13, 2001

Key Words: Iliac artery, aneurysm, and rupture

In contrast to abdominal aortic aneurysms (AAA) and aorto-iliac artery aneurysms, isolated iliac artery aneurysms (IAA) are uncommon, and their natural history remains largely unknown (1-3). Despite their rarity, several reports have suggested that isolated IAAs have a high risk of rupture with an associated high mortality rate (1,4,5). In this study, we report the successful treatment of a ruptured large isolated IAA.

Case Report

The patient, an 87-year-old man, was transferred to Atatürk University Medical Faculty after sudden abdominal pain. The patient underwent an emergency laparotomy for intra-abdominal disease at the General Surgery Department of the same faculty. There was a massive hemorrhage in the intra-abdominal region, and an emergency consultation with the Cardiovascular Surgery Department was needed. The patient developed hemorrhagic shock with arterial blood pressure at a critical level, and was given five units of blood and fluid. The retroperitoneum was immediately explored, and rupture of a large isolated IAA was observed, progressing from the proximal common iliac artery to the left proximal common femoral artery, with a diameter of approximately 10 cm. Intravenous heparin sulfate at a dosage of 5000 units was given to the patient. The aorta, common iliac arteries and left common femoral artery were then suspended and clamped. The hemorrhage was controlled and the aneurysm was opened. Thrombus and debris in the aneurysmal sac were removed, and the aneurysm wall was resected. Successful treatment was accomplished using both proximal and distal ligation, and aneurysmorrhaphy. Retroperitoneal and intra-abdominal structures were carefully observed; however, no other

aneurysm was detected. An aorto-left common femoral graft interposition was performed using a 6-8 mm-tapered externally supported expanded polytetrafluoroethylene (ePTFE) graft, and distal flow was provided. The retroperitoneum and abdomen were closed in the usual fashion after the bleeding was controlled. Bilaterally lower extremity pulses were palpable. The patient was taken to the intensive care unit and supported with mechanical ventilation. In the postoperative period, the patient remained hemodynamically stable and was extubated 24 hours after the operation. Although the patient had presenile dementia, there was no complication in the postoperative period. Due to the emergent intervention in the case, the aneurysm could not be imaged before the operation. The patient was discharged after recovery on the 12th day of the postoperative period. The iliac artery aneurysm sac was examined pathologically, and was atherosclerotic in origin.

Most aneurysms of the iliac artery occur in association with abdominal aortic aneurysms, either as an extension of the aortic aneurysm into the common iliac artery or as an IAA. However, isolated IAAs without an associated abdominal aortic aneurysm (AAA) are rare (2). The reported incidence of isolated IAA in the general population varies. In autopsy studies, 0.008% to 0.03% has been reported, and the incidence is estimated to be 6.58/100,000 for men and 0.26/100,000 for women in the United States (1,6). Based on hospital admissions in the United States, the incidence of known isolated IAA is 70 per 100,000 years in men, while in women the incidence is only 2 per 100,000 years, emphasizing the predominance of these aneurysms in men (7). Isolated IAA increase in frequency with age is rare before the age of 60 (2). Ours was a case of an 87-year-old man.

It is generally agreed that the most common cause of isolated IAA is arteriosclerosis. However, these aneurysms have also been reported to occur following pregnancy and syphilitic infections (2,4). In our case, the aneurysm that was examined pathologically was atherosclerotic in origin.

There are no prospective data in the literature to reliably define the natural history of isolated IAA. Nearly half the patients remain asymptomatic, but rupture is reported to occur in 0% to 75% (1-4,8). Our case of ruptured IAA was asymptomatic before the operation.

In most surgical series, the average size of the aneurysm is 4 to 5 cm, while the average size of a ruptured IAA has been estimated to be 6 cm (9). In our patient, the diameter of the aneurismal sac was approximately 10 cm. During follow-up of iliac aneurysms, reported rates of rupture have ranged from 10% to 70% after 5 years. Mortality from rupture is high; from 25% to 57%, whereas mortality from elective repair is less than 5% (3,4,6). Although IAA is usually asymptomatic until rupture, unique signs may appear due to local compression of adjacent pelvic structures. Patients may commonly appear with abdominal pain, as in our case. Urethral obstruction, hematuria, iliac vein thrombosis, large bowel obstruction, and lower extremity neurological deficit may occur, but they are much more frequently caused by other entities, often confusing the initial diagnosis of an iliac aneurysm. Most aneurysms are diagnosed incidentally at operation as in our case or during radiographic examination for other reasons (2,4). The common iliac artery is most frequently involved (70% to 90%) followed by the internal iliac artery (10% to 30%), with the external iliac usually uninvolved, for reasons not fully understood (2,4).

Iliac aneurysms can be approached through a lower abdominal retroperitoneal incision, but when they are bilateral or require aortic repair, a transabdominal approach is more versatile. In our case, an emergency laparotomy using a transabdominal approach was selected.

References

1. Dosluoğlu HH, Dryjski ML, Harris LM. Isolated iliac artery in patients with or without previous abdominal aortic aneurysm repair. *Am J Surg* 178: 129-132, 1999.
2. Cronenwett JL, Krupski WC and Rutherford RB. Abdominal aortic and iliac aneurysms. In: Rutherford RB, editor. *Vascular Surgery*. Fifth edn. WB. Saunders Company, Philadelphia, 2000, pp: 1273-1280.
3. Richardson JW, Greenfield LJ. Natural history and management of iliac aneurysms. *J Vasc Surg* 8: 165-171, 1988.

Unilateral common iliac aneurysms can be repaired with a simple interposition graft, but bilateral aneurysms are more successfully treated with aortoiliac reconstruction (2). Endovascular repair of an isolated IAA with a supported graft (or a covered stent) is possible if a sufficient length of normal iliac artery exists above and below the aneurysm to allow graft sealing. Early experience with endovascular repair of isolated IAAs has been disappointing, with an early and late adverse event rate of 27% in the largest published series (10). This is a rapidly developing technique, however, and improved results can be expected with increased experience and more refined devices. More encouraging results have been published in a recent, small series (11,12).

Aneurysmorrhaphy with graft interposition is the treatment of choice for most aneurysms (4). Once disruption has occurred, the fate of the patient depends on rapid operative therapy. Whenever resection is successful, frequent associated systemic complications require further diligent postoperative care. The mortality of emergent surgery remains high. The mortality of elective cases is 0% in most modern series, whereas it remains high for those with rupture (1,5). The rate of major morbidity in survivors of rupture is also high.

Our experience combined with the literature indicates that these lesions are rare, but that when present they have a propensity toward rupture. We suggest that the ratio of mortality and morbidity of ruptured IAA can be reduced by rapid and successful operative intervention.

Correspondence author:

Yahya ÜNLÜ

Atatürk Mah. Üniversite Loj. 38 / 8,

25170, Erzurum, Turkey

E-mail: yahyaunlu@hotmail.com

4. McCready RA, Pairolero PC, Gilmore JC, Kazmier FJ, Cherry KJ, Hollier LH. Isolated iliac artery aneurysms. *Surgery* 93: 688-693, 1983.
5. Hill AB, Ameli FM. Fate of the iliac arteries after repair of abdominal aortic aneurysm with an aortobifemoral bypass graft. *Ann Vasc Surg* 12: 330-334, 1998.
6. Krupski WC, Selzman CH, Florida R, Strecker PK, Nehler MR. Contemporary management of isolated iliac aneurysms. *J Vasc Surg* 28: 1-13, 1998.
7. Lawrence PF, Lorenzo-Rivero S, Lyon JL. The incidence of iliac, femoral and popliteal artery aneurysms in hospitalized patients. *J Vasc Surg* 22:409-413, 1995.
8. Kasirajan V, Heltzer NR, Beven EG, O'Hara PJ, Krajewski LP, Sull TM. Management of isolated common iliac artery aneurysms. *Cardiovasc Surg* 6: 171-177, 1998.
9. Bolin T, Lund K, Skau T. Isolated aneurysms of the iliac artery: what are chances of rupture? *Eur J Vasc Surg* 2(4): 214-217, 1988.
10. Cardon JM, Cardon A, Joyeux A, Vidal V, Noblet D. Endovascular repair of iliac artery aneurysm with endoprosthesis I: a multicentric French Study. *J Cardiovasc Surg* 37(suppl 1): 45-50, 1996.
11. Dorros G, Cohn JM, Jaff MR. Percutaneous endovascular stent-graft repair of iliac artery aneurysms. *J Endovasc Surg* 4: 370-373, 1997.
12. Marin ML, Veith FJ, Lyon RT, et al. Transfemoral endovascular repair of iliac artery aneurysms. *Am J Surg* 170: 179-181, 1995.