

Management of Isolated Iliac Artery Aneurysms — Iliac Artery Aneurysms not Associated with Abdominal Aortic Aneurysm —

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ABSTRACT. Ten patients with isolated iliac artery aneurysms seen over the past 10 years were reviewed. All patients were men. Their ages ranged from 60 to 81 years (mean 69.7). The patients were symptomatic in 80% of the cases at the time of diagnosis. Aneurysms ranged in diameter from 2.5 to 8.0 cm (mean 6.5 cm). Six patients had a solitary aneurysm, while four others possessed multiple aneurysms, mostly located in bilateral common iliac artery, with extension into the internal, iliac and femoral artery in one patient. All patients had surgical treatment. Resection with graft interposition was the most common procedure. We conclude that early elective resection and arterial reconstruction are recommended because rupture of the aneurysm carries a high mortality rate.

Key words: iliac artery aneurysm — aneurysms — rupture

INTRODUCTION

In contrast to abdominal aortic and combined aortoiliac artery aneurysms, isolated aneurysms of the iliac arteries are uncommon.¹⁾ However, they may have a high risk of rupture having an associated high mortality rate.²⁾ Since Moll reported the first successful ligation of iliac artery aneurysm,³⁾ the incidence of iliac artery aneurysm has been reported to be only one-tenth of abdominal aortic artery aneurysms.^{4,5)} In this report, we review 10 cases of isolated iliac artery aneurysms including bilateral case experienced at our hospital during the past 10 years.

CLINICAL MATERIAL

Ten patients with isolated iliac artery aneurysms were reviewed. The records of all patients were analyzed with regard to age, sex, presenting symptoms, diameter, location of the aneurysm, the type of operation performed, whether the aneurysm had ruptured and the results of operation (Table 1). All patients with aneurysms of the common, and internal iliac arteries were

TABLE 1. Characteristics of patients

CASE NO	AGE/SEX	SYMPTOMS	PHYSICAL FINDINGS	LOCATION OF ANEURYSM	ANEURYSM DIAMETER(cm)	TREATMENT	RESULT
1	71, M	Abdominal pain	Pulsatile abdominal mass	Bilateral common iliac artery	Rt:5.0 Lt:6.5	Aorto-bilateral external iliac artery bypass	Excellent
2	66, M	Negative	Pulsatile abdominal Mass	Bilateral common iliac artery	Rt:7.0 LT:8.0	Aorto-bilateral external iliac artery bypass	Excellent
3	70, M	Negative	Pulsatile abdominal Mass	Bilateral common iliac artery	Rt:5.0 Lt:6.0	Aorto-bilateral external iliac artery bypass	Excellent
4	74, M	Negative	Pulsatile abdominal mass(in umbilical and bilateral inguinal region)	Bilateral common & internal iliac & femoral artery	Common iliac artery (Rt:6.5, Lt:5.5) Internal iliac artery (Rt:4.5, Lt:3.5) Femoral artery (Rt:8.0, Lt:5.5)	Aorto-bilateral femoral artery bypass	Excellent
5	65, M	Negative	Pulsatile abdominal mass	Left common iliac artery	8.0	Aorto-left external iliac artery bypass	Excellent
6	60, M	Abdominal pain	Pulsatile abdominal mass	Left common iliac artery	6.0	Aorto-left external iliac artery bypass	Excellent
7	65, M	Negative	Pulsatile abdominal mass	Left common iliac artery	8.0	Aorto-left external iliac artery bypass	Excellent
8	65, M	Negative	Negative	Left common iliac artery	4.5	Left common iliac to external iliac artery bypass & internal iliac to the graft with side to end anastomosis	Excellent
9	77, M	Abdominal pain	Abdominal distension & severe tenderness	Right internal iliac artery	Ruptured portion was unclear	Suture closure of right internal iliac artery	Excellent
10	81, M	Intermittent claudication	Negative	Left internal iliac artery(arteriosclerosis obliterans of right superficial femoral artery)	5.0	Aneurysmal resection & right femoro-popliteal bypass surgery	died of CVD

Rt:Right, Lt:Left
CVD:cerebrovascular disease

included, while patients with iliac artery aneurysms associated with abdominal aortic aneurysms were excluded, Eight patients presented with a pulsatile lower abdominal mass having a bruit on physical examination. Of 4 symptomatic patients, case 9 developed sudden abdominal pain throughout the abdomen due to rupture of the aneurysm. The remaining 6 patients were free of symptoms at the time of initial investigation. Case 4 had multiple aneurysms without symptoms. The aneurysm of case 8 was disclosed incidentally on CT scan during the investigation for lung cancer. The diameter of aneurysms in these patients ranged from 3.5 to 8.0 cm (mean 6.5 cm). Resection with Dacron graft interposition was performed in all patients. In case 10 an internal iliac artery aneurysm was ligated because of ruptured portion was unclear. He died of a brain infarction three months later. Although case 10 unfortunately died of cerebrovascular disease after the operation, there were no other cases of operative death or postoperative complications developed immediately after the surgery.

CASE REPORTS

Clinical data are summarized in Table 1.

Case 1: Preoperative arteriography and CT scan of a 71-year-old man who began to notice a pulsatile abdominal mass in the right and left lower quadrant showed a bilateral common iliac artery aneurysms. Surgery revealed that aneurysms were arising from 2.5 cm distal portion of abdominal aortic bifurcation. He underwent aorto-bilateral external iliac artery bypass surgery.

Case 2: Preoperative arteriography of a 66-year-old man who began to notice a pulsatile abdominal mass in the right and left iliac region showed a bilateral common iliac artery aneurysms (Fig 1, left). The aneurysms were arising from 2 cm distal portion of abdominal aortic bifurcation. He underwent aneurysmal resection and aorto-bilateral common iliac artery bypass surgery. The bilateral distal legs of the graft were anastomosed with end-to-end anastomoses to hemi-circular end-to-end anastomoses of bilateral external and internal iliac arteries, because the aneurysms were extended to the bilateral iliac bifurcation. Postoperative arteriography showed a normal configuration of bypass graft (Fig 1, right).

Case 3: Enhanced abdominal CT scan of a 70-year-old man who noticed a pulsatile abdominal mass in the right and left iliac region showed a bilateral common iliac artery aneurysms (Fig 2, left). Preoperative arteriography showed a bilateral common iliac artery aneurysms shown in Fig 2 (right). The aneurysms were arising from abdominal aortic bifurcation (Fig 3, left). He underwent aneurysmal resection and aorto-bilateral common iliac artery bypass surgery. Postoperative arteriography showed a normal configuration of bypass graft (Fig 3, right).

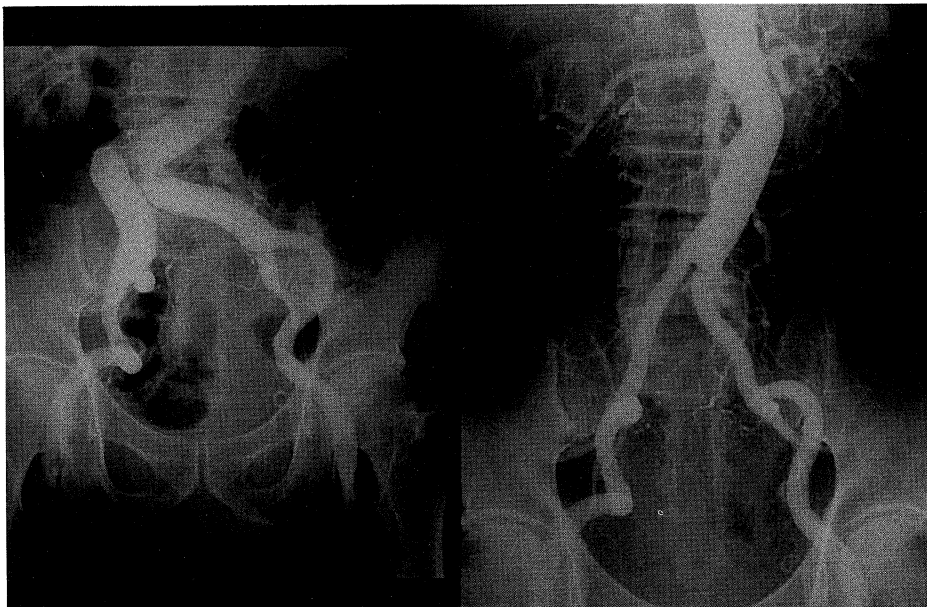


Fig 1. Left: Preoperative arteriography shows right and left iliac artery aneurysms. Right: Postoperative arteriography shows a normal configuration of aorto-bilateral external iliac artery bypass graft.

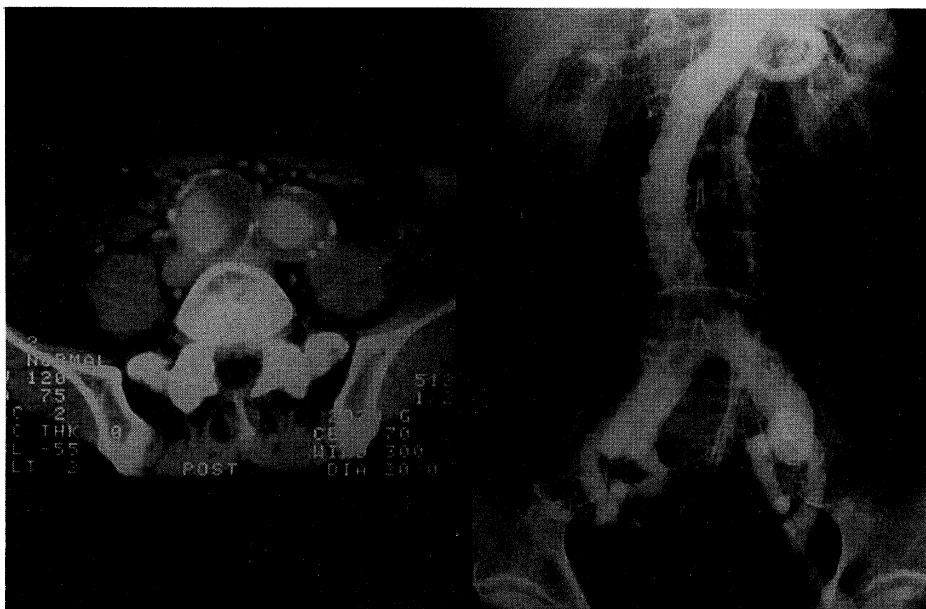


Fig 2. Left: Enhanced abdominal CT scan shows right and left common iliac artery aneurysms. Right: Preoperative arteriography shows right and left common iliac artery aneurysms.



Fig 3. Left: The right and left common iliac artery aneurysms were arising from abdominal aortic bifurcation. Right: Postoperative arteriography shows a normal configuration of bypass graft.



Fig 4. A pulsatile abdominal mass in bilateral inguinal region



Fig 5. Right: Preoperative arteriography shows bilateral common iliac and internal iliac artery aneurysms. Left: Preoperative arteriography shows right and left superficial femoral artery aneurysms.



Fig 6. Left: Preoperative arteriography shows left common iliac artery aneurysm. Right: Postoperative arteriography shows a normal configuration of aorto-external iliac artery bypass graft.

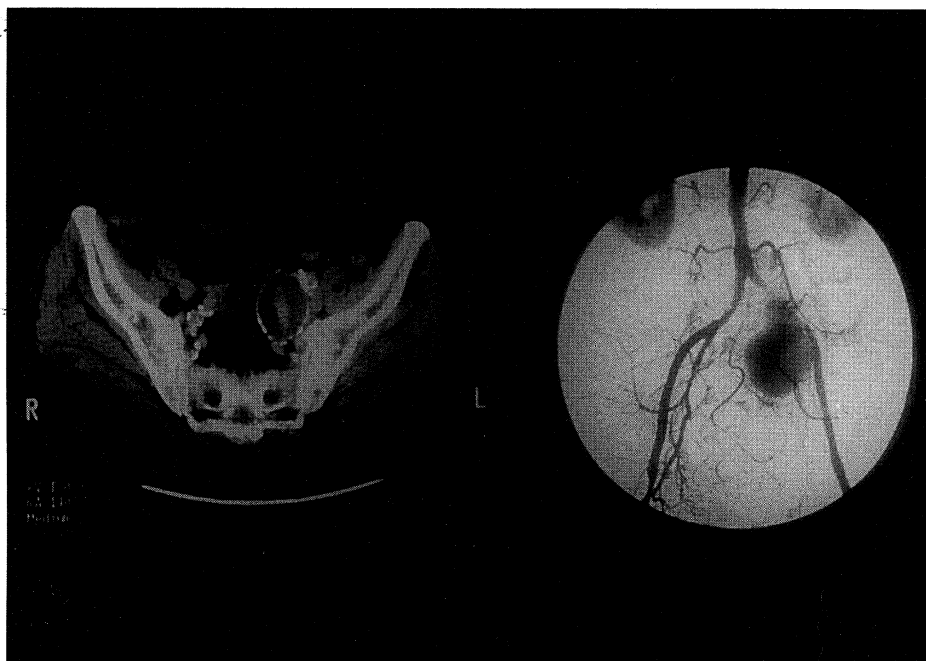


Fig 7. Left: Enhanced abdominal CT scan shows left common iliac artery aneurysm. Right: Preoperative arteriography shows left common iliac artery aneurysm.

Case 4: A 74-year-old male undergoing evaluation for prostatic hypertrophy was found to have a pulsatile mass in the bilateral inguinal region (Fig 4) and umbilical region. CT scan showed the mass in the region of bilateral common, and internal iliac arteries, and femoral arteries. Preoperative arteriography confirmed the diagnosis (Fig 5, right and left). Aneurysmal resection and aorto-bilateral femoral artery bypass surgery were performed.

Case 5: A 65 year-old-man was referred to our hospital from his local doctor for further investigation of pulsatile abdominal mass in the left iliac region. Arteriography showed the common iliac artery aneurysm as shown in Fig 6 (left). The intraoperative finding that led to aneurysmectomy and aorto-left external iliac artery bypass surgery was performed. Postoperative arteriography showed the abnormal configuration of bypass graft (Fig 6, right).

Case 6: Preoperative arteriography of a 60-year-old man who began to notice a pulsatile abdominal mass in the left iliac region showed the left common iliac artery aneurysm. He underwent aneurysmal resection and aorto-left external iliac artery bypass surgery.

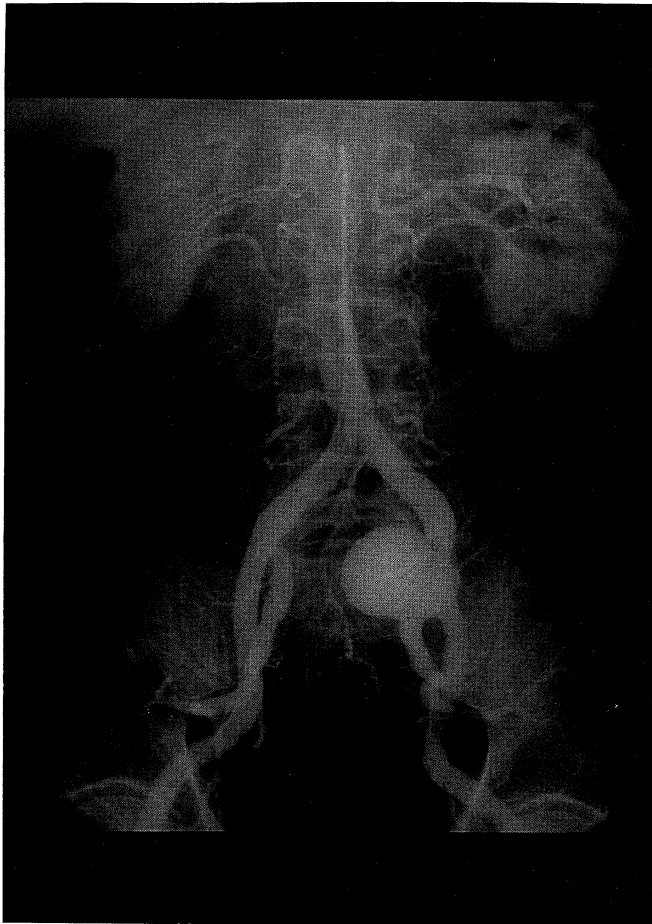


Fig 8. Preoperative arteriography shows left common iliac artery aneurysm.

Case 7: Enhanced abdominal CT scan of a 65-year-old man who noticed a pulsatile abdominal mass in the left iliac region showed the left common iliac artery aneurysm (Fig 7, left). Preoperative arteriography showed the left common iliac artery aneurysm as shown in Fig 7 (right). Surgery revealed the aneurysm arising from 1.5 cm distal portion of the orifice of the left internal iliac artery. It was 8.0 cm in diameter. He underwent aneurysmal resection and aorto-left external iliac artery bypass surgery.

Case 8: A 65-year-old man undergoing further investigation for lung cancer and prostatic hypertrophy was found to have a calcified mass in the left side of the pelvis. Arteriography (Fig 8) showed the left common iliac artery aneurysm. He underwent aneurysmal resection and left common iliac-left external iliac artery bypass surgery, and also the left internal iliac artery was anastomosed to the graft with side to end anastomosis. Surgery revealed the aneurysm arising from the left common iliac artery just 1 cm proximal to the orifice of left internal iliac artery.

Case 9: A 77-year-old man was admitted to our hospital because of severe abdominal pain. Emergency operation revealed intraperitoneal bleeding. A 2000 ml blood and coagulation was evacuated from the peritoneal cavity. Ruptured aneurysm was resected successfully with proximal and distal ligation of the internal iliac artery.

Case 10: Preoperative arteriogram of a 81-year-old male who noticed 400 ml intermittent claudication in the right lower leg showed the left internal iliac artery aneurysm (Fig 9, left) and arteriosclerotic change of right superficial femoral artery (Fig 9, right). He underwent aneurysmal resection and right

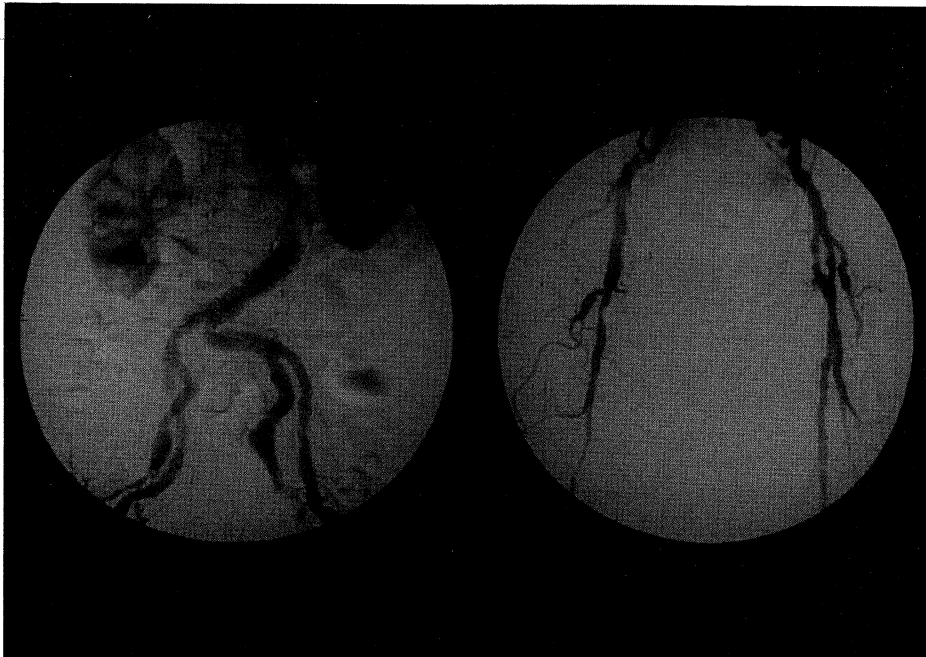


Fig 9. Left: Preoperative arteriography shows left internal iliac artery aneurysm. Right: Preoperative arteriography shows arteriosclerosis obliterans of right superficial femoral artery

fomoro-popliteal artery (above knee) bypass surgery. Except case 10 the postoperative course of other 9 cases were all uneventful.

DISCUSSION

Since Moll³⁾ reported a case of successful ligation of a common iliac artery aneurysm in 1827 and MacLaren⁶⁾ reported ligation of an internal iliac artery aneurysm in 1913. Most aneurysms of the iliac arterial region are found to be extensions of abdominal aortic aneurysms, either as an extension of the aortic aneurysm onto the common iliac artery or as a separate aneurysm of the iliac artery. The isolated iliac artery aneurysms are rare. Lowry *et al*⁷⁾ reported a low frequency of 5% and McCready *et al*⁸⁾ reported the relative frequency of 0.5% of iliac artery aneurysms not associated with abdominal aortic aneurysm. It is generally agreed that the most common cause of isolated iliac artery aneurysm is arteriosclerosis. In our series all these aneurysms were histologically arteriosclerotic in origin. Physical examination is often inconclusive because of their deep location in the pelvis or because that iliac arteries are intimately adjacent to other pelvic structures. When the patient has symptoms, the aneurysms are found at a later stage of development and are larger in size. They are usually the result of pressure exerted due to the aneurysm intimately adjacent to other pelvic structures. Lowry *et al*⁷⁾ reported that 36% of patients had a palpable, pulsatile abdominal and rectal mass before rupture. According to our experience, 60% of patients had no symptoms; that is, case 1 and 6 had a gradually increasing abdominal pain as their symptoms. Case 9 was acute abdomen due to the rupture of aneurysm. Case 10 had an intermittent claudication due to arteriosclerosis obliterans (ASO) as associated disease. On the other hand, 80% of patients had a pulsatile mass as their physical findings and only two cases (case 8, 10) was discovered incidentally. For example, case 8 was diagnosed incidentally in undergoing further investigation for his lung neoplasm and also arteriography for evaluating ASO of case 10 showed internal iliac artery aneurysm. Most aneurysms are discovered incidentally at operation or during roentgenographic examination for other reasons. Abdominal ultrasonography, CT scan, and arteriography are all useful to confirm the diagnosis. Schuler *et al*⁹⁾ reported an average size of 8.5 cm. Among our patients the mean aneurysmal diameter was 6.5 cm. Review of the literature suggests that the rate of rupture of an isolated iliac artery aneurysm is high. Lowry *et al*⁷⁾ reported that 75% of their patients presented with ruptured aneurysms. Schuler *et al*⁹⁾ reported 51% of ruptured cases among their patients and also 69% of their patients died of aneurysm rupture. McCready *et al*⁸⁾ reported the risk of rupture is low and patients with aneurysms less than 3 cm in diameter can probably be safely observed. Although only case 9 was ruptured in our series and emergency operation did not show accurate aneurysmal diameter because the ruptured portion was not clear, other cases more than 8 cm in diameter were repaired successfully. Lowry *et al*⁷⁾ reported that 75% of their patients presented with ruptured aneurysms. Although initial reports³⁾ was ligation alone for a few young patients, the operative techniques and strategies has improved, lately. Endoaneurysmorrhaphy, ligation of the branches, and possible graft interposition is considered to be the treatment of choice. Unfortunately we lost only one

patient (case 10) because of brain infarction 60 days after operation. All other 9 cases who underwent graft interposition were successful with having no post-operative complications. We consider that all patients with isolated iliac artery aneurysms who are a good medical risk should undergo elective repair because they have no characteristic symptom and they increase in diameter gradually and the frequency of rupture.

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