

## CASE REPORT

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# Internal Iliac Artery Aneurysms: Distinct Treatment Paths for Two Separate Cases

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**ABSTRACT** Internal iliac artery aneurysms (IIAA), predominantly occurring in the common iliac artery, are rare but can lead to significant morbidity and mortality. Effective management is crucial to prevent complications such as rupture, which can result in life-threatening hemorrhage. These aneurysms may occur in isolation or in conjunction with aortic aneurysms. We present 2 cases of internal iliac artery aneurysms, each managed with distinct therapeutic strategies. The 1st case involved an isolated IIAA treated successfully with surgical repair, and 2nd one treated with endovascular approach. These cases highlight the importance of tailored management approaches for IIAs. Close monitoring and timely treatment remain essential in managing these complex vascular conditions.

**Keywords:** Endovascular procedures; hydronephrosis; iliac aneurysm; ligation

In healthy adults, the internal iliac artery diameter is approximately  $0.54 \pm 0.15$  cm, varying with age, gender, and overall health. An aneurysm is defined when the diameter of the common iliac artery exceeds 1.85 cm in males and 1.5 cm in females.<sup>1</sup> Iliac artery aneurysms are often associated with abdominal aortic aneurysms, occurring in about 10% of cases, while isolated iliac artery aneurysms are less common, with an incidence of around 2%.<sup>2</sup> This article explores the clinical features and current treatment options for managing internal iliac artery aneurysms (IIAA).

## CASE REPORT

### CASE 1

The patient has granted informed consent. A 57-year-old male presented to the emergency department with severe left flank pain and restlessness. On examination, his pulse rate was 120 beats per minute, and his blood pressure was 160/90 mmHg. A thoracoabdominal computed tomography (CT) scan revealed a 90 mm IIAA (65 mm diameter) with hydronephrosis due to ureteral compression ([Figure 1a](#)). Given the severity of the findings, the patient was immediately

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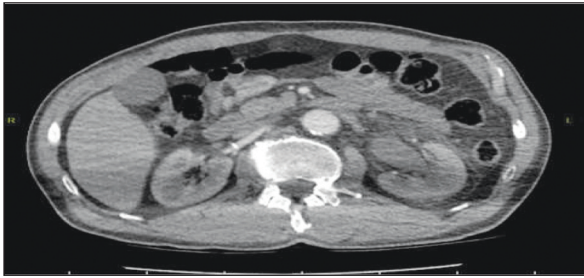


FIGURE 1a: Preoperative CT showing left kidney hydronephrosis

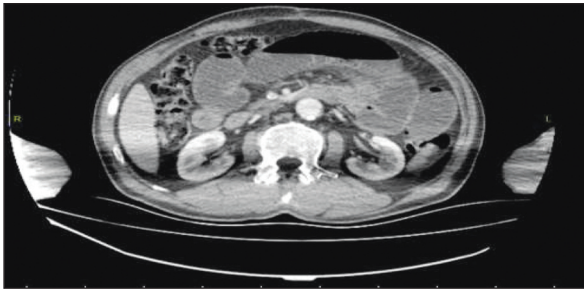


FIGURE 1b: Postoperative CT showing a normal left kidney

scheduled for emergency surgery. Hydronephrosis, resulting from the external compression of the renal pelvis by the aneurysm, could lead to impaired renal function if left untreated. Furthermore, the patient exhibited signs of systemic distress, including a high pulse rate and elevated blood pressure, raising concerns for potential complications such as aneurysm rupture or ischemia. During the operation, the aneurysm sac was opened, decompressed, and ligated both proximally and distally. Postoperatively, the pa-

tient was hemodynamically stable and transferred to the cardiovascular surgery intensive care unit (ICU). The patient was discharged without complications on the 5<sup>th</sup> postoperative day and remained in good health at the 36-month follow-up (Figure 1b). The early recovery, along with the resolution of clinical symptoms, suggests that the surgical intervention was successful in both addressing the vascular pathology and alleviating the hydronephrosis caused by the aneurysm compression.

## CASE 2

The patient has granted informed consent. An 81-year-old male with a history of aortobifemoral bypass surgery performed 15 years ago for an abdominal aortic aneurysm presented to our emergency department with complaints of diffuse abdominal and groin pain lasting for 1 week. The patient also had a history of prostate cancer with lung metastasis. His general condition was stable upon presentation. A thoracoabdominal CT scan highlights a complex vascular issue requiring immediate assessment and intervention (Figure 2a). (the right common iliac artery measured 57 mm in diameter, the left 62 mm, with the left internal iliac artery measuring 95 mm and the right 20 mm)

The patient was admitted to the ICU for pain and blood pressure control. Peripheral angiography was performed, revealing the intactness of the previously placed aortobifemoral bypass graft and retrograde filling of the bilateral iliac aneurysms. The

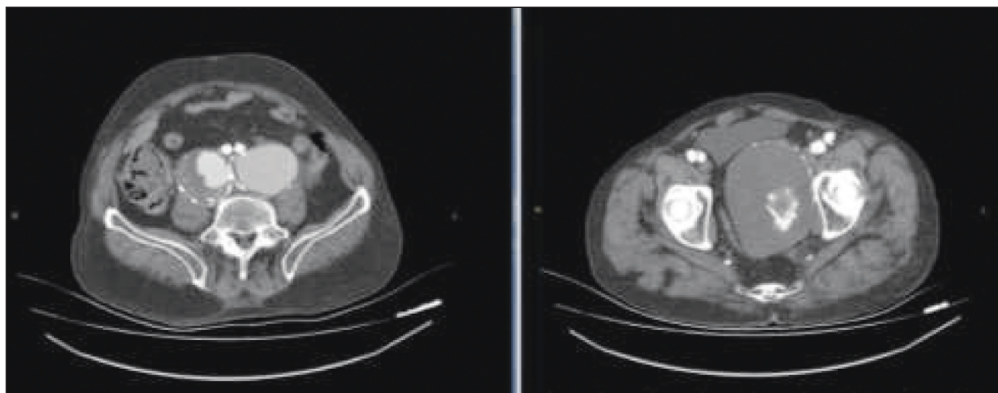
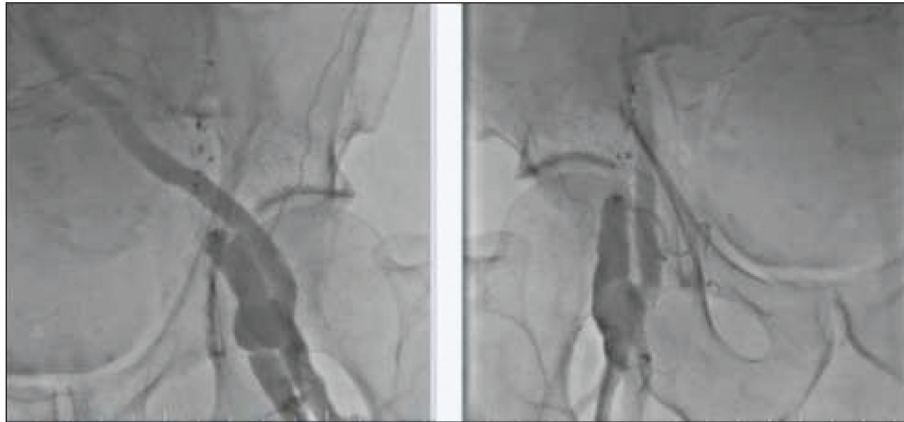


FIGURE 2a: Preoperative CT showing bilateral iliac artery aneurysms, with the left internal iliac artery aneurysm



**FIGURE 2b:** Postoperative CT showing successful closure of the bilateral aneurysms

procedure was initially paused to allow for comprehensive planning and coordination of the intervention strategy. One week later, under local anesthesia and fluoroscopic guidance, selective catheterization of the iliac aneurysms was performed via femoral artery access. For the left iliac aneurysm, 2 14-gauge vascular plugs (LifeTech Scientific Corporation, Shenzhen, China) were strategically placed proximal to the retrograde feeding artery to prevent further blood flow into the aneurysm. This was followed by the deployment of 4 multibeam plugs (Invamed, Ankara; Turkey) between the initial plugs to ensure complete occlusion and stabilization of the aneurysm sac. Similarly, the right iliac aneurysm was addressed by occlusion and prevent any potential endoleak. Bilateral aneurysms were successfully closed (Figure 2b). The meticulous placement of the plugs ensured effective closure of the aneurysms, minimizing the risk of rupture. The day after the procedure, the patient's symptoms significantly improved, and he was discharged in stable condition. Follow-up assessments showed complete closure of both aneurysms, and the patient was advised to return for regular monitoring.

## DISCUSSION

IAs are most caused by atherosclerosis (arterial hardening), genetic factors, and connective tissue disorders, all of which contribute to the weakening of the arterial wall. IIAA are often asymptomatic and

may be discovered incidentally during routine imaging tests. Symptoms can vary depending on the aneurysm's size, location, and the degree of compression on nearby organs. Common symptoms include pelvic pain, discomfort (often unilateral), pain during sexual intercourse, numbness or pain in the buttocks, thighs, or legs, urinary frequency or urgency, bowel dysfunction (e.g., constipation or diarrhea), and back pain.<sup>3</sup>

Most patients (95%) are elderly men (median age 71 years), but our 1st patient was relatively young. A review by Dix et al. reported abdominal pain in 31.7%, urinary symptoms or renal failure in 28.3%, lumbosacral pain in 18.3%, groin pain in 11.7%, hip or buttock pain in 8.3%, and rectal bleeding or constipation in 8.3% of cases.<sup>4</sup> Urological symptoms, such as ureteral colic, hydronephrosis, pyelonephritis, and renal failure, may develop secondary to ureteral obstruction.<sup>5</sup>

Early intervention is crucial, as conservative measures cannot prevent aneurysm growth, and elective surgery has a significantly lower mortality rate compared to emergency rupture repair (7% vs. 45%).<sup>4</sup> Elective repair is typically indicated for isolated IAA when the diameter reaches 3.5 cm or more.<sup>6</sup> In our 2<sup>nd</sup> patient, the diameters of the right and left iliac arteries were 57 mm and 62 mm, respectively. Despite these large diameters, recent studies suggest that there is no direct correlation between aneurysm size and rupture risk.<sup>3</sup>

Treatment options for IAAs include open surgical repair and endovascular repair techniques. The choice of approach depends on factors such as the patient's overall health, anatomy, aneurysm location, and comorbidities. Traditional surgical methods, such as ligation, excision, endoaneurysmorrhaphy, and proximal and distal ligation, remain valid options but carry higher risks of bleeding and longer recovery times.<sup>4</sup> Endovascular techniques, including stenting and embolization, offer advantages but they may not fully address pressure-related symptoms. Stenting and coiling are considered equivalent to proximal and distal ligation.<sup>7</sup> Proximal ligation alone reduces the risk of bleeding with limited dissection of the pelvis, but the aneurysm may rupture due to late retrograde flow, and compression symptoms are not relieved. Proximal and distal ligation, along with ligation of lateral branches, if present, is a less effective treatment, although the risk of bleeding is greater. Unilateral ligation is well tolerated if there is no disease in the contralateral artery. Compared with surgical repair, endovascular repair of iliac aneurysms results in shorter hospital stays, local anesthesia, no need for ICU admission, lower transfusion requirements, fewer complications (bleeding, infection), and similar mid-term outcomes.<sup>8</sup> In a study of 26 patients treated with endovascular repair, the technique achieved a 100% primary technical success rate and a low reintervention rate (7.7%).<sup>9</sup>

For our 1st patient, emergency surgery was necessary due to instability and the need to decompress the aneurysm to protect renal function. In the 2<sup>nd</sup> case, considering the patient's medical history and prior abdominal surgery, we opted for endovascular treatment to minimize surgical risks while effectively managing the aneurysms.

IIAA are rare but serious conditions that require prompt attention from vascular surgeons. Treatment should focus not only on rupture prevention but also on addressing compression-related symptoms. Advances in endovascular techniques, including new stent designs and embolization materials, hold promise for improving treatment outcomes. Future research should focus on identifying biomarkers for aneurysm progression and developing personalized treatment plans based on genetic profiling, which could transform the management of IAA.

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#### **Conflict of Interest**

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

#### **Authorship Contributions**

**Idea/Concept:** Eda Gödekmerdan Katırcioğlu; **Design:** Eda Gödekmerdan Katırcioğlu, Mihriban Yalçın; **Control/Supervision:** Eda Gödekmerdan Katırcioğlu; **Data Collection and/or Processing:** Eda Gödekmerdan Katırcioğlu, Ayşe Çiçek; **Analysis and/or Interpretation:** Eda Gödekmerdan Katırcioğlu; **Writing the Article:** Eda Gödekmerdan Katırcioğlu, Mihriban Yalçın; **Critical Review:** Eda Gödekmerdan Katırcioğlu, Mihriban Yalçın; **References and Fundings:** Eda Gödekmerdan Katırcioğlu, Ayşe Çiçek; **Materials:** Eda Gödekmerdan Katırcioğlu, Ayşe Çiçek.

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