

Successful recanalization of a left common iliac artery chronic total occlusion adjacent to an ectopic renal artery at the aortoiliac bifurcation

Aorta-iliyak bifurkasyonda ektopik renal artere yakın olan sol ana iliyak arter tıkanıklığının perkütan yolla rekanalize edilmesi

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Summary– Ectopic kidneys are rare and usually present incidental findings during invasive or non-invasive angiography. Their parenchyma is not more susceptible to disease and symptoms occur mainly due to alteration of the anatomic relations. The main renal artery of the ectopic kidney derives invariably from the aorta; however, accessory renal arteries may originate from almost any arterial branch adjacent to the ectopic kidney. Knowledge of the common anatomic variations is important during complex peripheral interventions. We present the case of a 46-year-old male with symptoms of claudication secondary to left common iliac artery occlusion. He was diagnosed as occlusion of the left common iliac artery at the aortoiliac bifurcation in close proximity to the ectopic renal artery by peripheral angiography, and percutaneous intervention of the left common iliac artery was successful. Percutaneous intervention led to resolution of the patient's symptoms of claudication as well as preservation of the ectopic renal artery. In such cases, renal ectopy and aberrant arteries should be promptly recognized in order to avoid vascular or renal complications.

Ectopic kidneys are rare (0.1%) and the incidence of pelvic ectopy is approximately 1 in 2200 to 1 in 3000.^[1,2] They usually represent incidental findings during invasive or non-invasive angiography; however surgical intervention may be required in cases of recurrent infection, ureteropelvic junction obstruction, calculi or chronic pain.^[3] The parenchyma of the ectopic kidney is not more susceptible to disease than the normally positioned one and symptoms occur mainly due

Özet– Ektopik böbrekler nadir görülmekle birlikte, genellikle invaziv veya ivaziv olmayan anjiyografide rastlantısal bulgulardan birisidir. Parenkimin kendisi hastalıklara meyilli olmamakla birlikte, anatomideki değişiklikten dolayı semptomlar gelişebilmektedir. Ektopik böbreklerin arteri genellikle aortadan dal alırlar. Ancak aksesuar böbrek arterleri ektopik böbreğin yanındaki herhangi bir arterden beslenebilir. Normal anatomiden değişik olan varyasyonların bilinmesi, kompleks periferik arter girişimleri açısından önem taşımaktadır. Burada sol ana iliyak arter tıkanıklığına bağlı ileri derecede klodikasyon semptomu olan ve periferik anjiyografi ile tespit edilen aorta-iliyak bifurkasyonundaki ve ektopik renal artere yakın sol iliyak arter tıkanıklığı perkütan yolla başarılı olarak tedavi edilen 46 yaşındaki bir erkek hastayı sunuyoruz. Bu perkütan girişim sonucunda hastanın klodikasyon semptomları iyileştiği gibi, aynı zamanda ektopik böbrek arteri de korunabildi. Böyle olgularda ektopik böbrek arteri ve diğer aberrant arterlerin varlığının gösterilmesi damar ve böbrek komplikasyonlarından kaçınılması açısından önem taşımaktadır.

to the alteration of the anatomic relations causing hydronephrosis, ureteropelvic or ureterovesical obstruction, vesicoureteral reflux or pyelonephritis.^[4] Aberrant renal arteries may potentially represent an important clinical challenge when peripheral interventions are performed.

Abbreviations:

CFA	Common femoral artery
CIA	Common iliac artery
CTO	Chronic total occlusion
EIA	External iliac artery
Fr	French
IIA	Internal iliac artery
TRAS	Transplanted renal artery stenosis

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CASE REPORT

A 46-year-old gentleman with Rutherford Class III, lifestyle-limiting left leg claudication on maximal medical treatment was referred for an aorto-iliac peripheral angiogram. His past medical history was remarkable for a known left common iliac artery (CIA) chronic total occlusion (CTO) identified by an abnormal ankle-brachial index (ABI) study, coronary artery disease with a previous myocardial infarction and coronary stents without any active symptoms, controlled dyslipidemia and active smoking.

His progressive left leg claudication had been restricting his daily activities including his ability to work and prompted his primary care provider to refer him for a diagnostic angiogram.

We performed a diagnostic abdominal aortogram via the right transfemoral approach with a 5 French (Fr) Neff catheter (Cook Medical, Bloomington, IL). Two right renal arteries were visualized with a normally positioned right kidney (Figure 1a). An ectopic “left” kidney was identified in the left iliac fossa with a single patent renal artery. The ostium of the ectopic renal artery was located in the middle of the aortoiliac bifurcation in close proximity to the median sacral artery. The right CIA and external iliac artery (EIA) were patent and the right internal iliac artery (IIA) was occluded. The left CIA was ostially occluded. Collaterals deriving from the left lumbar and lateral sacral arteries reconstituted the left EIA distal to the iliac bifurcation (Figure 1a). A selective renal arteriogram confirmed the patency of the ectopic kidney renal artery (Figure 1b).

Given the crescendo symptomatology in the left leg, we elected to attempt a percutaneous intervention of the left CIA. Access to the left common femoral artery (CFA) was achieved with a micropuncture kit. The CTO was successfully crossed with a regular Terumo 0.035” angled Glidewire (Terumo Medical Corporation, Somerset, NJ) by a 5Fr glide catheter (Terumo Medical Corporation, Somerset, NJ). Percutaneous transluminal angioplasty was performed with a 3mm and subsequently with a 5 mm balloon. Over a 0.35” Wholey wire (Mallinckrodt Inc., St. Louis, MO) an 8x40 mm balloon-expandable stent was placed in the left CIA ostium (Figure 2) and a second 7x20 mm balloon-expandable stent was positioned distally ex-

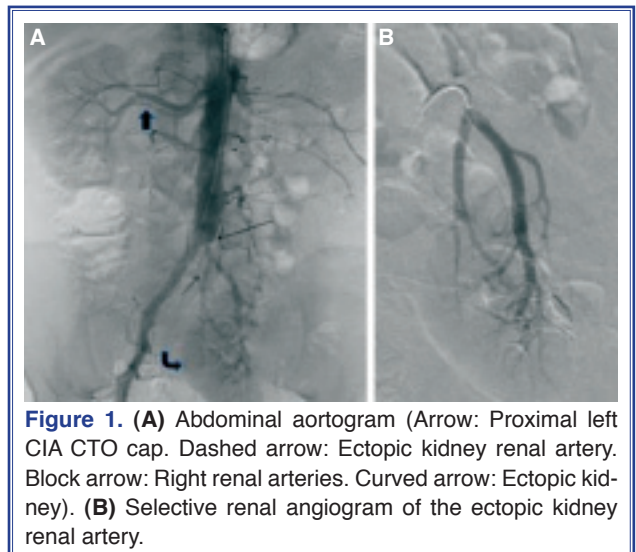


Figure 1. (A) Abdominal aortogram (Arrow: Proximal left CIA CTO cap. Dashed arrow: Ectopic kidney renal artery. Block arrow: Right renal arteries. Curved arrow: Ectopic kidney). (B) Selective renal angiogram of the ectopic kidney renal artery.

tending to the proximal segment of the left EIA with minimal overlap (Figure 3a).

The final angiogram showed good angiographic results with minimal residual stenosis and absence of complications (Figure 3b). The ectopic renal artery flow was preserved with an intact ostium. The patient noted immediate improvement of his claudication and he was discharged the next day. A follow-up clinical appointment confirmed a significant improvement of

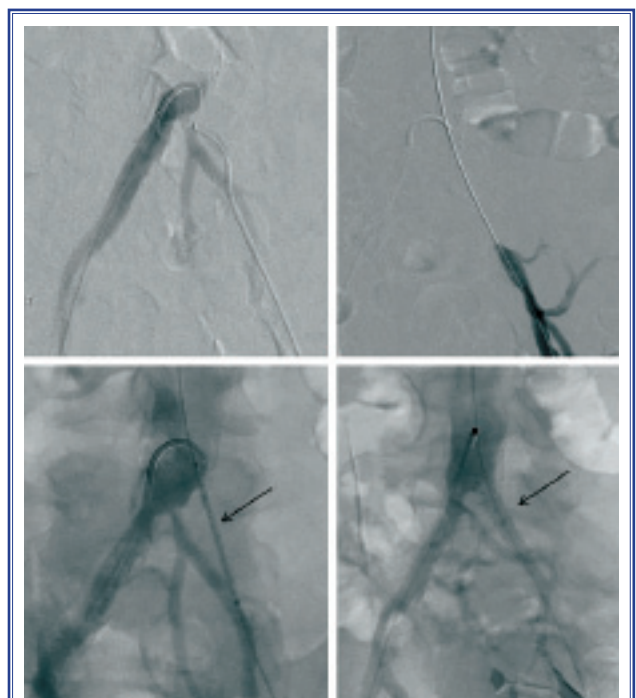


Figure 2. Stent positioning in the ostium of the left CIA (Arrow: 8x40 mm balloon expandable stent).

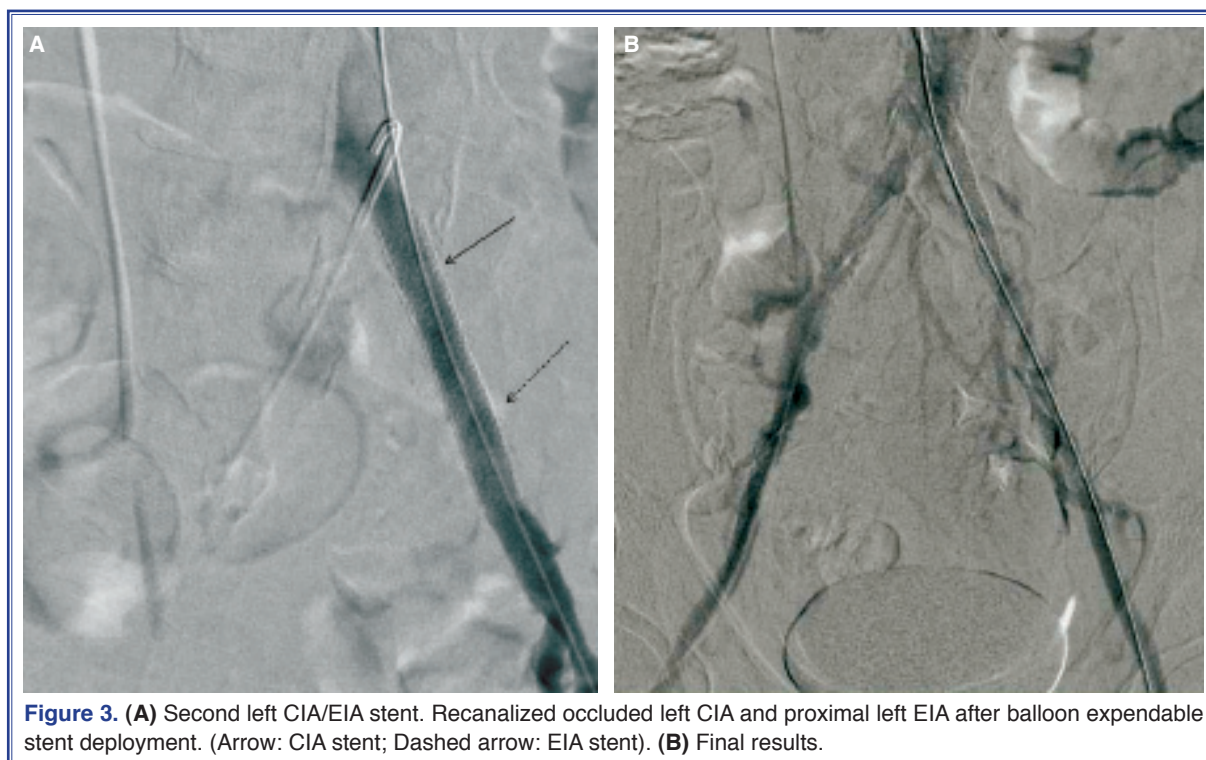


Figure 3. (A) Second left CIA/EIA stent. Recanalized occluded left CIA and proximal left EIA after balloon expandable stent deployment. (Arrow: CIA stent; Dashed arrow: EIA stent). (B) Final results.

his claudication to Rutherford class I symptoms and preserved renal function.

DISCUSSION

When ectopic kidneys are perfused by a single artery, it invariably derives from the aorta. However, accessory renal arteries may originate from the celiac artery or above the celiac axis, superior mesenteric artery, inferior mesenteric artery, right colic artery, second and third lumbar artery, spermatic artery, ovarian artery, the CIA, the EIA, IIA, median sacral artery, twelfth intercostal artery and contralateral renal artery.^[5]

Knowledge of the common anatomic variations is important during peripheral interventions. Renal ectopy is extremely rare but it should be recognized in order to avoid iatrogenic damage to its vasculature.

Descriptions of vascular disease or percutaneous interventions in or within close proximity to the ectopic renal arteries have not been described in the literature. It is unclear whether they are less prone to vascular disease or whether it is under-recognized. However, worldwide interventional experience in “aberrant” renal artery percutaneous interventions exists through the transplanted renal artery stenosis

(TRAS). TRAS is a common cause of resistant hypertension, allograft dysfunction, and graft loss in renal transplant patients.^[6]

In our case, the ectopic renal artery at the aortoiliac bifurcation represented an important clinical challenge for revascularization of occluded left CIA. Unilateral occlusions involving both the CIA and EIA are classified as TASC type D lesions and percutaneous treatment can be complicated.^[7] In our case, an attempt for antegrade recanalization through the contralateral CFA or a brachial artery access could jeopardize the renal artery ostium which was located adjacent to the CTO “cap” of the left CIA. Retrograde crossing carried the risk of sub-intimal guidewire entrance and the risk to extend a dissection plane to the ectopic renal artery. PTA of the lesion could cause atherosclerotic plaque shift and obstruct the renal artery ostium. In these cases, it is common to perform kissing balloon of both CIA but in our case it would be prohibitive due to the formation of a tri-furcation between the two CIA and the renal artery. In our case, successful PCI of the left CIA was performed with no injury to the ectopic renal artery.

Ectopic kidneys exist in 0.1% of the general populations and their renal arteries rarely cause renal or

vascular disease. We present the case of an ectopic kidney renal artery at the aortoiliac bifurcation in a patient undergoing percutaneous intervention of a CTO of the left ostial CIA. In such cases, renal ectopy and aberrant arteries should be promptly recognized in order to avoid vascular or renal complications.

Conflict-of-interest issues regarding the authorship or article: None declared.

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Key words: Coronary occlusion; iliac artery/abnormalities; intermittent claudication/radiography; kidney/blood supply; renal artery/abnormalities.

Anahtar sözcükler: Koroner tıkanıklık; iliak arter/anormallik; geçici klodikasyon/radyografi; böbrek/kan desteği; renal arter/anormallik.