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Case Report / Приказ болесника

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SUMMARY

Introduction Endovascular treatment of chronic total occlusion (CTO) represents a true challenge even for experienced interventional radiologists. We are presenting a case of hidden antegrade dissection of external iliac artery (EIA) after failed attempt to recanalize CTO of common femoral artery (CFA).

Case outline Fifty-two-year-old male patient was admitted for multidetector computed tomography angiography. Left common iliac artery (CIA) stenting was performed followed by "crossover" attempt of recanalization of right CFA CTO that failed. The next day, left femoral superficial artery angioplasty was performed and after one month, angioplasty of the left popliteal and bellow knee arteries. A month later the patient was readmitted for surgical reconstruction of the CFA. After desobstruction, excellent inflow was obtained and Dacron graft inserted. A few hours postoperatively, Fogarty catheter thrombectomy was performed. The next morning pulsations were weakened again and CT angiography showed antegrade dissection of the EIA. Stenting of the EIA was performed with two stents and favourable outcome. After detailed analysis of CT, hidden thrombosed antegrade dissection of EIA was noted in lateral view, that was not seen in posterior/anterior view and was presented as fibrous plaque with mural thrombosis. Dissection occurred after failed attempt of CFA recanalization and was clinically silent until flow was established triggering opening of the false lumen and release of thrombotic masses.

Conclusion In patients with failed angioplasty of chronic total occlusion of CFA and CT characteristics of fibrous plaque proximal of the site of attempted angioplasty, thrombosed antegrade dissection should be thought of.

Keywords: iliac artery dissection; common femoral artery; chronic total occlusion; thrombosis

САЖЕТАК

Увод Ендоваскуларни третман хроничне тоталне оклузије (ХТО) представља прави изазов чак и за искусне интеревентне радиологе. Приказујемо случај скривене антероградне дисекције спољашње илијачне артерије (СИА) након неуспелог покушаја реканализације ХТО заједничке феморалне артерије (ЗФА).

Приказ болесника Мушкарац старости 52 године примљен је ради мултидетекторске компјутеризоване томографије ангиографије. Учињен је стентинг леве заједничке илијачне артерије, а након тога и *crossover* покушај реканализације ХТО десне ЗФА који остаје без успеха. Следећег дана учињена је ангиопластика леве површне бутне артерије, а након месец дана и ангиопластика поплитеалне и потколених артерија леве ноге. Месец дана касније пацијент је поново примљен због хируршке реконструкције ЗФА. Након деобструкције, добијен је одличан проток и учињена је интерпозиција Дацронског графта. Неколико сати постоперативно учињена је и тромбектомија Фогарти катетером. Наредног јутра пулсације у десној препони су поново биле ослабљене и *CT* ангиографија је показала антероградну дисекцију СИА. Учињен је стентинг СИА са два стента и са задовољавајућим исходом. Након детаљне анализе *CT* снимака, верификована је тромбозирана дисекција СИА у латералном прегледу, која није била виђена у постериорно/антериорном прегледу и које је била презентована као фиброзни плак са муралном тромбозом. Дисекција је настала након неуспелог покушаја реканализације ЗФА и била је клинички нема док није успостављен проток који је покренуо отварање лажног лумена и ослобађање тромботичних маса.

Закључак Код пацијената са неуспешном ангиопластиком хроничне тоталне оклузије ЗФА и *CT* карактеристикама фиброзног плака проксимално од места покушаја ангиопластике, треба помислити и на тромбозирану антероградну дисекцију.

Кључне речи: дисекција илијачне артерије; заједничка феморална артерија; хронична тотална оклузија; тромбоза

INTRODUCTION

Common femoral artery (CFA) chronic total occlusion (CTO) represents a true challenge even for experienced and skilled interventional radiologist. In case of extensive, complex and long occlusive lesions of CFA and iliac arteries, surgical treatment is still preferable treatment option [1–4]. However, progress of endovascular therapy as less invasive procedure in the last two decades, have resulted in numerous publications showing good results of endovascular treatment of CFA stenosis and occlusion with low rate of post-procedural morbidity and mortality [5–9]. We are presenting an interesting case of hidden thrombosed antegrade dissection of external iliac artery (EIA) after unsuccessful CTO angioplasty of CFA evident only after surgical revascularization.

CASE REPORT

Fifty-two-year-old male patient was admitted to our Institution for multidetector computed tomography (MDCT) angiography. He complained on rest pain in the left foot with livid ischemia that appeared 10 days prior to admission. He also had claudication in his right leg after 100m, which wasn't clinically manifested upon admission due to the inability of walking and the rest pain in the left leg. His past medical history included hypertension and hyperlipidemia. Echocardiography showed regular findings except for dilated left atrium (45mm). Laboratory findings were within referent values except for creatine kinase that was elevated - 654 international units (UI)/L. The examination showed absent right femoral pulse, left femoral pulse was palpable with ischemia of 3rd and 4th finger on the left foot. Ankle brachial indexes on the left leg were 0.37 on both, posterior tibial artery (PTA) and anterior tibial artery (ATA) and 0,62 on PTA and 0.75 on ATA on the right leg. MDCT arteriography ("General Electrics (GE)" 64 slice device) showed significant left common iliac artery (CIA) stenosis, occlusion of right CIA at transition to common femoral artery (CFA), left superficial femoral artery (SFA) subocclusion and significant stenosis of left popliteal artery.

Firstly, left CIA stenting was performed by antegrade approach from the left groin followed by "crossover" simultaneous attempt of recanalization of right CFA CTO that failed due to heavily calcified lesions and CFA surgical treatment was indicated. Right CFA CTO angioplasty was attempted via crossover approach with 55cm long SheatLess guiding system (Asahi-Intecc®, Tokyo, Japan) along with Shinobi 0.014 guidewire (Cordis®, Fremont, United

States of America). The next day by left retrograde approach, SFA angioplasty was performed with stent placement. A month later, the patient was readmitted for planned right CFA surgical reconstruction. On admission he still complained on ischemic pain in the left leg and control MDCT angiography showed regular findings after left CIA and SFA stenting (Figure 1), but also significant popliteal artery stenosis beneath the stent. Bearing in mind persisting pain in the left foot, left popliteal artery, posterior and anterior tibial artery angioplasty was performed with favorable outcome and right CFA reconstruction was delayed for the next hospitalization.

After one month the patient was readmitted for right CFA CTO surgical reconstruction based on the previous MDCT findings. Intraoperatively, extensive exposure of the right CFA was performed, and CFA, SFA, deep femoral artery and side branches were clamped. After CFA desobstruction and plaque removal, excellent inflow was obtained and Dacron tubular graft was inserted between EIA and femoral arteries. Clamps were removed and distal pulsations were regular. In the evening, femoral pulsations were attenuated and the patient was sent back in the operating room. Inflow was present but weakened, Fogarty catheter was introduced and thrombectomy was performed without any difficulties, followed by improved inflow. The next morning, pulsations in the right groin were weakened again and control MDCT angiography was performed. Surprisingly, antegrade dissection of the EIA was noted starting just above the level of the proximal graft anastomosis and going to the common iliac artery bifurcation (Figure 2). Graft as well as proximal and distal anastomosis were with regular findings. Stenting of the right EIA was performed with placement of two stents and favorable outcome.

Postoperative course was uneventful, ankle brachial indexes were 0.8 on both arteries on the right leg and 1.0 on both arteries on the left leg. The patient was discharged on the sixth postoperative day. After six months follow up, vascularization of both legs was well preserved.

This case report was approved by the institutional ethics committee, and written consent was obtained from the patient for the publication of this case report and any accompanying images.

DISCUSSION

Management of CFA lesions is challenging. Surgical treatment and endarterectomy of CFA lesions has been proved to be safe and reliable procedure [1–4]. Elsherif et al. [4] has reported the outcome of 1134 revascularization procedures due to critical limb ischemia, out of which 66 CFA endarterectomies with favorable outcome. However, improvement in endovascular procedures in recent years, has resulted in numerous publications showing good results of endovascular treatment of CFA lesions [5–10]. In a recent review of 7 CFA endarterectomy studies and 4 CFA endovascular studies, endovascular approach was associated with lower rate of morbidity and mortality but with higher reintervention rate when compared to surgery [7]. Nakama et al. have recently reported one-year outcomes of thrombendarterectomy (TEA) and endovascular treatment for CFA lesions in 1193 patients and found that one-year primary patency rate was significantly higher in the TEA group (96.6% *vs.* 82.3%, $p < 0.001$) but with higher rate of periprocedural complications in the same group of patients [10].

Results of endovascular treatment of 946 isolated CFA lesions were reported by Siracuse et al. [8] with low rate of periprocedural morbidity and mortality and with dissection rate of 2.9%. Bohme et al have also reported favorable outcome of CFA angioplasty performed in 250 patients, out of which 64 patients had CFA occlusion [11]. The overall complications rate was 9.1% with the primary patency rate of 90.8%, 81.2% and 72% at six, 12, and 24 months, respectively [11].

In case of combined CFA lesions and multiple steno-occlusive proximal or distal disease, hybrid approach, CFA endarterectomy with combined endovascular approach, has been reported with reduced operative risk in patients with high morbidity [12]. A novel approach, stent-assisted angioplasty of CFA lesions showed satisfactory technical success, with low restenosis rate during the follow-up but with high mortality rate [13]. On the other hand, multichannel balloon angioplasty of heavily calcified CFA lesions has been described as well, with good initial results [14].

Although percutaneous angioplasty showed favorable outcome in the treatment of CFA lesions, post-procedural dissection is still one the major issues after peripheral angioplasty [15, 16, 17]. In the presented case, common femoral artery CTO angioplasty was attempted by subintimal approach followed by hidden, clinically silent, thrombosed antegrade dissection of iliac artery. When we have discussed the reasons for unrecognized dissection, we have looked

in detail and once more processed all previous CT images. After processing images of control CT angiography, performed after attempt of CFA CTO recanalization and the first CIA and SFA angioplasty, we have seen alteration within the EIA wall in the lateral view (Figure 3) that was not visible in posterior/anterior (PA) view (Figure 1). At first, we thought that this alteration was fibrous atheromatous plaque with mural thrombosis, but then we have realized that it actually was thrombosed antegrade dissection (Figure 3). These findings were also not visible the first CT presentation before angioplasty attempt (Figure 4) and then we've realized that dissection occurred in the meantime after the attempted angioplasty of the CFA. Dissection was clinically silent due to thrombosed false lumen and distal CFA occlusion. After successful surgical revascularization, established flow opened the false lumen which triggered the release of thrombotic masses causing early graft thrombosis successfully treated by Fogarty catheter thrombectomy. Once the flow was established in the true and false lumen, the dissection membrane was clearly visible (Figure 2).

By this case we want to point out three things. Firstly, it is important to emphasize that CT angiography could be misleading describing thrombosed antegrade iliac artery dissection as fibrous atheromatous plaque with mural thrombosis. CT characteristics were almost identical and diagnosis was intensified by the fact that the dissection was clinically silent due to already present distal CFA occlusion. The second thing we wanted to highlight is the importance of lateral view while processing CT images as it could reveal hidden minor alteration within arterial wall that are not visible in the PA view. And the third and finally, we wanted to draw attention to conversion of asymptomatic, clinically silent, thrombosed antegrade dissection in the manifest dissection associated with thromboembolic events. In case of unrecognized thrombosed antegrade dissection in patients with CTO, successful surgical revascularization and established flow could trigger the release of thrombotic mass followed by embolic events and limb-threating ischemia.

In patients with failed angioplasty of CFA CTO and CT characteristics of fibrous plaque with mural thrombosis proximal to the site of attempted recanalization, thrombosed antegrade dissection should be thought of. Processing CT images in lateral view could reveal changes within the arterial wall that are not visible in the PA view. Successful surgical revascularization of CTO lesions of the CFA in patients with previously attempted angioplasty could trigger conversion of hidden thrombosed to evident antegrade iliac artery dissection.

Conflict of interest: None declared.

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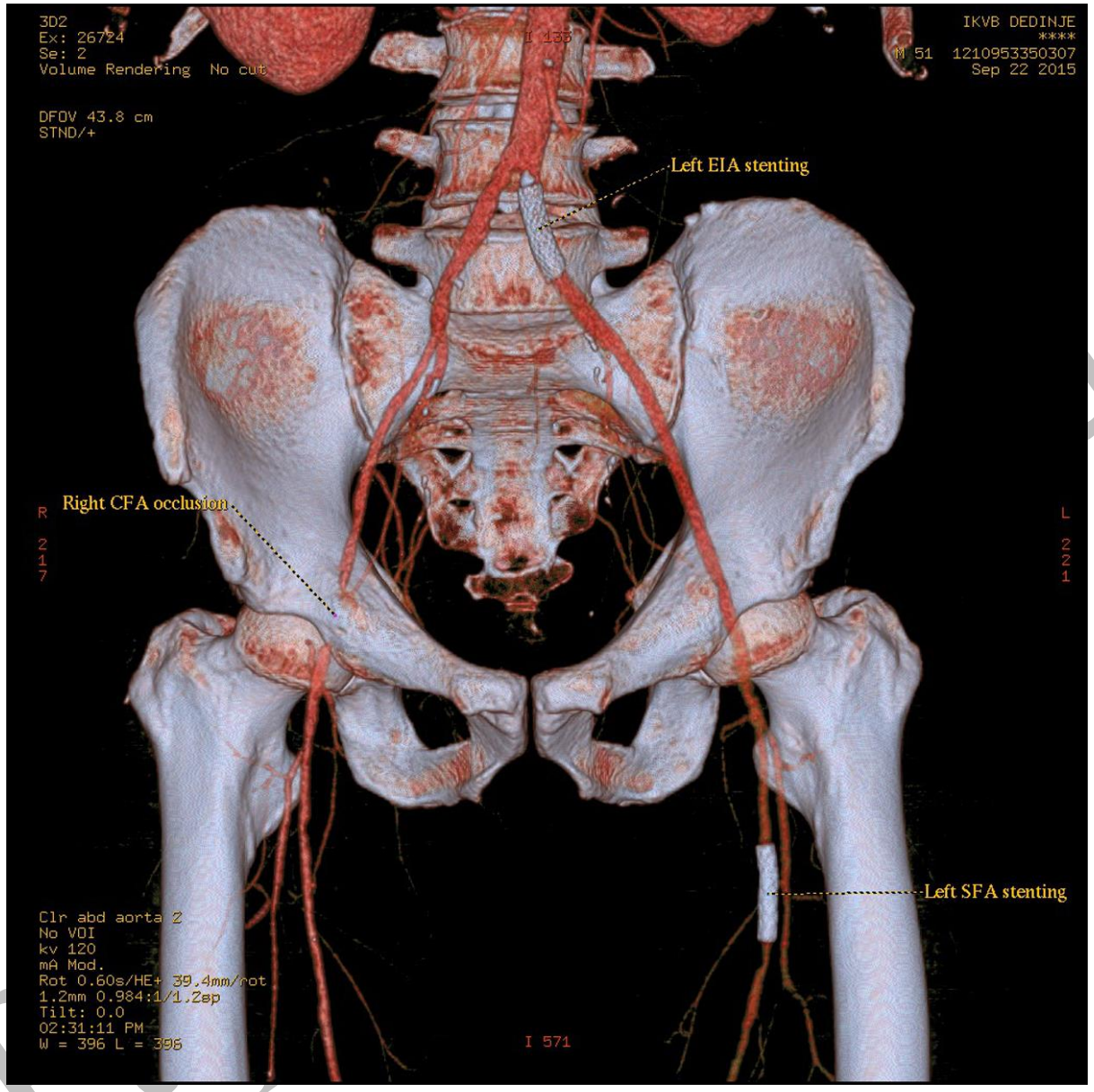

Figure 1. Multidetector computed tomography angiography; regular findings after left common iliac artery and superficial femoral artery (SFA) angioplasty with stent placement and evident right common femoral artery (CFA) occlusion – posterior/anterior view

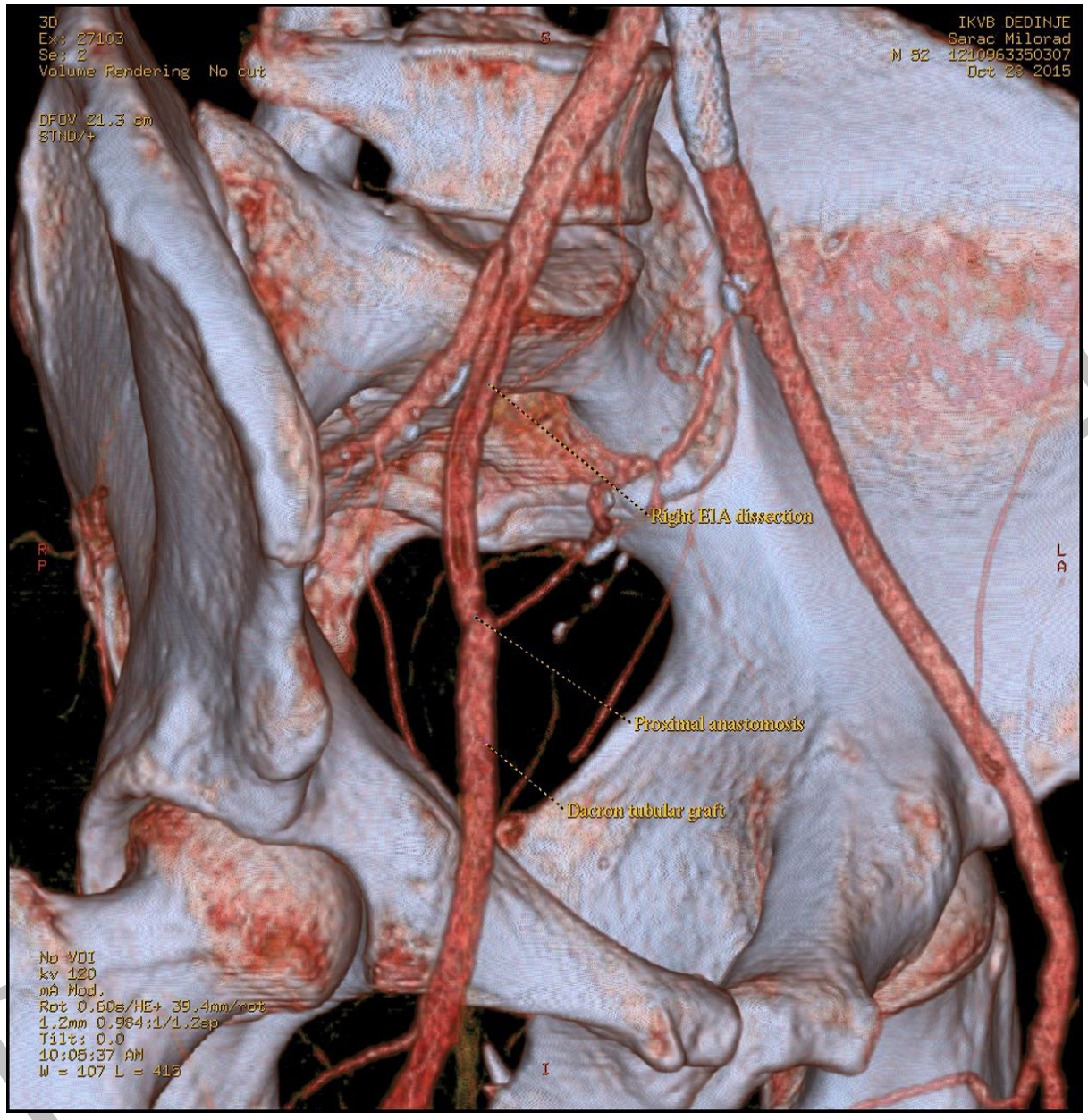

Figure 2. Multidetector computed tomography angiography; antegrade right external iliac artery (EIA) dissection starting just above proximal anastomosis of Dacron tubular graft

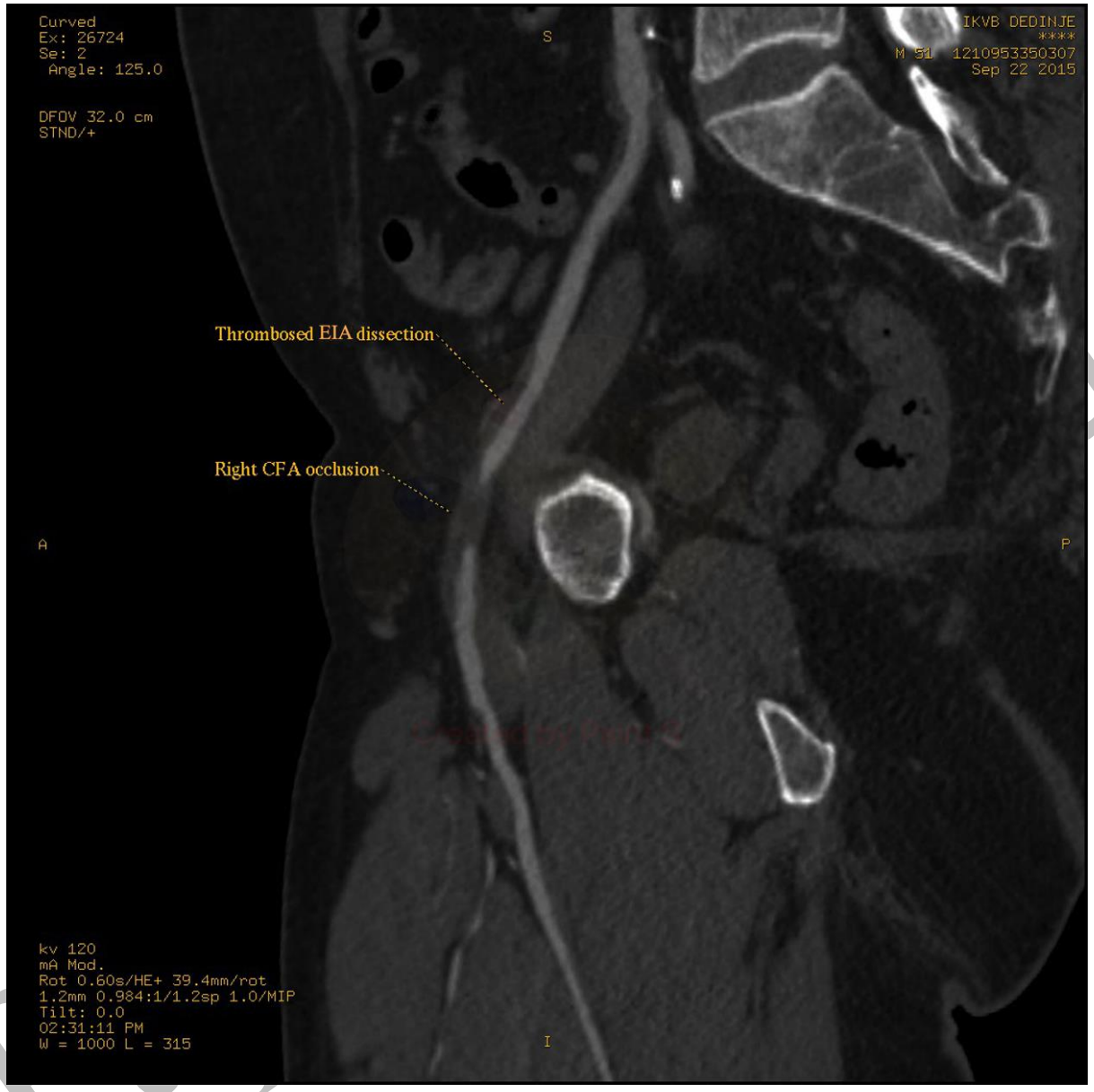

Figure 3. Hidden thrombosed antegrade dissection of the right external iliac artery (EIA) after angioplasty attempt of chronic total occlusion of the common femoral artery (CFA) – lateral view

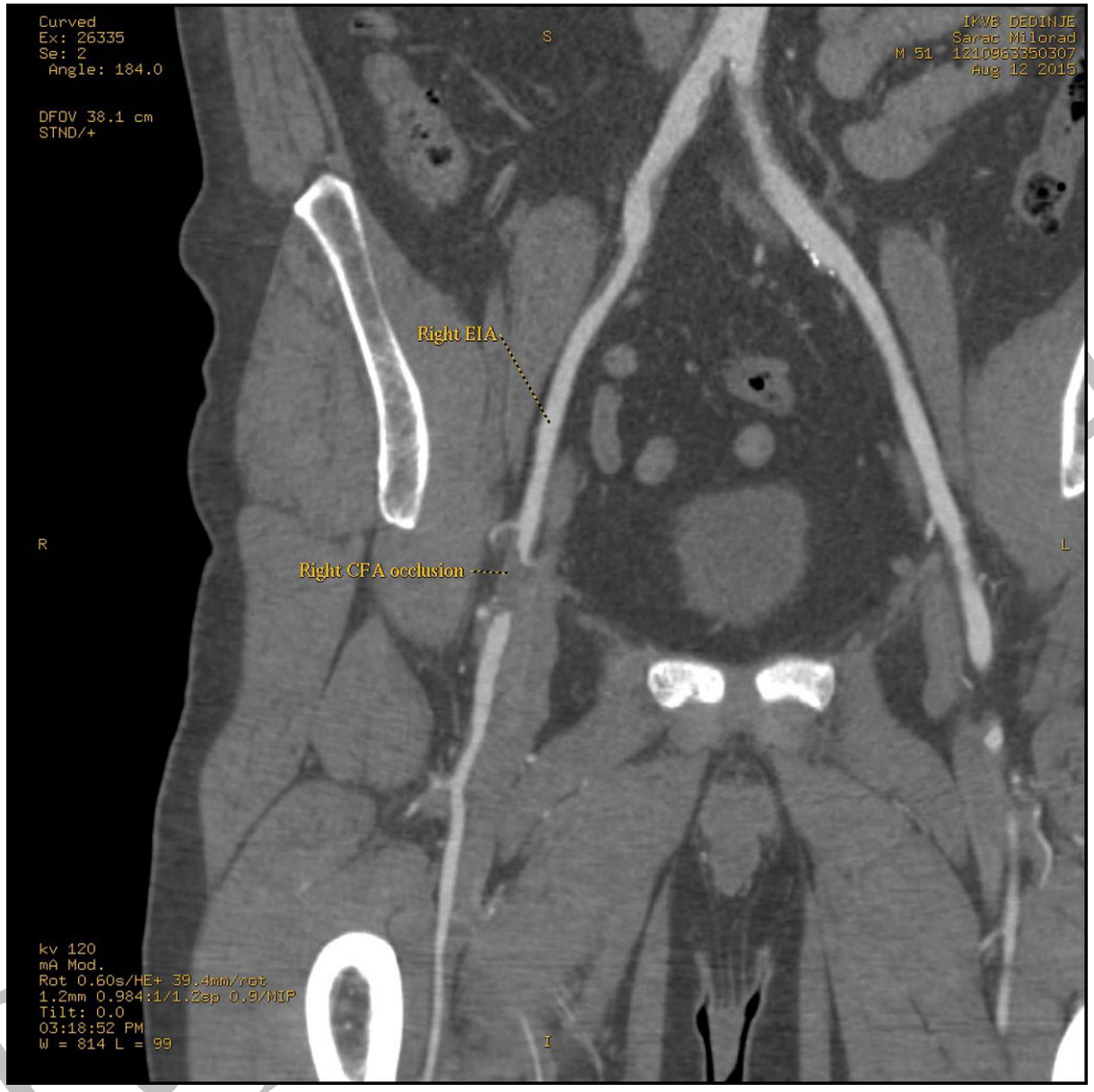

Figure 4. Multidetector computed tomography angiography; chronic total occlusion of the right common femoral artery (CFA) without any signs of thrombosed dissection prior to angioplasty attempt

