

Case report

The challenging step in EVAR; gate cannulation by cross-over technique from ipsilateral side: a case report

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Abstract

Endovascular aneurysm repair (EVAR) has become one of the crucial treatment modalities. The most challenging step of EVAR is the contralateral limb gate cannulation. Usually, the contralateral limb cannulation is done retrograde by using a catheter and hydrophilic guidewire. If we cannot use the conventional method, the brachial artery approach or contralateral femoral snare technique may be used. We report the case of an 87-year-old man with known rectum adenocarcinoma, because of the iliac artery aneurysm and inadequate landing zone, who successfully underwent EVAR with cross-over technique from the ipsilateral side.

Keywords: EVAR, AAA, Gate Cannulation, Cross-over technique

Introduction

Endovascular aneurysm repair (EVAR) has become one of the crucial treatment modalities [1]. Many of the available devices in EVAR have a bifurcated figure which is composed of the main body stent with a longer ipsilateral limb and shorter contralateral limb. The most challenging step of EVAR is the contralateral limb gate cannulation [2]. Most commonly, the contralateral gate is cannulated retrograde by using a conventional catheter and hydrophilic guidewire. If this maneuver fails, a brachial approach or contralateral femoral snare catheter as a cross-over technique may be used. We report the case of an 87-year-old man because of the iliac artery aneurysm and inadequate landing zone, who successfully underwent EVAR with cross-over technique from the ipsilateral side.

Case presentation

An 87-year-old male with known rectum adenocarcinoma, whom a candidate for chemotherapy, presented with a history of abdominal pain with stable observations. Computed tomography (CT) aortogram demonstrated a 45 mm Asymptomatic AAA, with

a 33 mm infrarenal landing zone, 55 mm Left CIA aneurysm, 29 mm Left IIA aneurysm, severely tortuous Left EIA, and Right CIA was healthy but very calcified. (Fig1) The iliac artery aneurysm required intervention, due to the lack of sufficient landing zone in the iliac artery and also due to old age and underlying disease, the patient was considered for EVAR treatment. An Endovascular aneurysm repair (EVAR) was recommended to the patient and relatives. After sufficient explanation, informed consent was obtained. The patient was asked to fast from midnight. After prepping and draping, In this case, first of all, Left Internal Iliac Artery coiled with pushable coils (COOK® MReye®) and then main body stent (COOK® Zenith LP (ZALB-26-70)) inserted from Left Femoral access, because of the left iliac access was much more tortuous, we had chosen that side for main body stent insertion for better pushability, main body stent was semi-deployed and an attempt at contralateral limb cannulation with conventional techniques was done through the right femoral access, the contralateral limb was being compressed against the right lateral wall of the



Figure1: Left Common Iliac Artery Aneurysm in an 87-year-old man with known rectum adenocarcinoma

aneurysm sac by the deployment system and leaving no space for cannulation from the right side. (Fig2) Because of unsuccessful cannulation from the contralateral limb, we chose Brachial Artery to cannulate but the left axillary artery was extremely tortuous and therefore accessibility from the left arm was aborted. (Fig3) Right Brachial Artery access always elevates the risk of CVA, especially in this patient's cohort, so we avoid it where possible at our center. Therefore, the alternative solution was chosen, we fully deployed the main body stent and pigtail catheter inserted from left femoral access and crossed over into right iliac artery and hydrophilic wire snared through the catheter from right femoral access. (Fig4) The patient underwent EVAR successfully, followed by an uneventful postoperative recovery (Fig5). No endoleak or complication of the graft was noted at follow-up.

Results

Contralateral limb cannulation plays a key role in EVAR procedure to exclusion of the Abdominal aortic aneurysm [1]. Traditionally, the contralateral short limb is deployed at the contralateral side of the aorta [2]. The second common reason for converting endovascular surgery to open surgery is the inability to cannulation, which has been reported to be up to 5.9% of EVAR operations in some series [3]. We demonstrated a technique by cross-over the catheter and guidewire from the ipsilateral access to cannulate the contralateral gate by using a snare device. This technique may be of interest in



Figure2: The contralateral limb was being compressed against the right lateral wall of the aneurysm sac

selected cases where retrograde technique and also brachial approaches were unsuccessful. However, it must be noted that this cannot be recommended in angulated aortic



Figure3: The extremely tortuosity of Left Axillary Artery

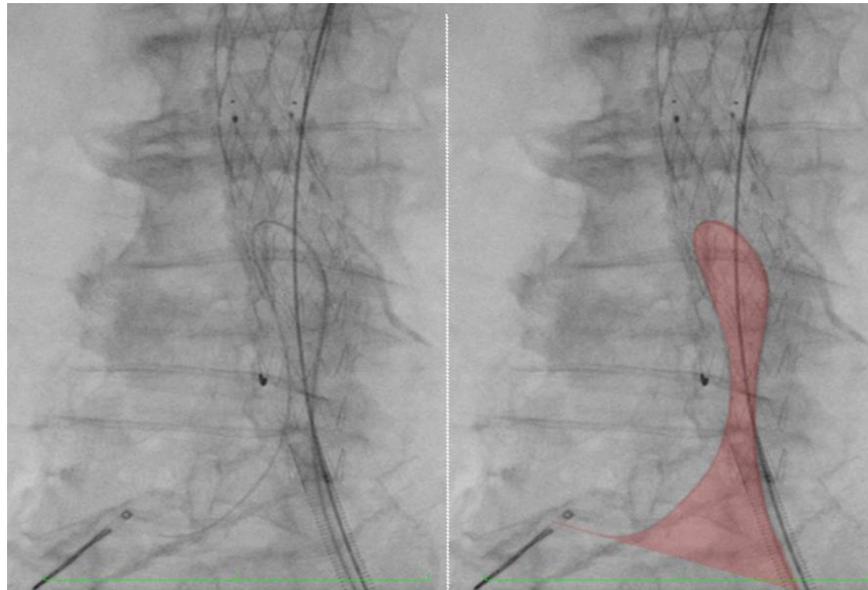


Figure4: Snaring from Right Femoral Artery

anatomies, because by fully deploying the ipsilateral limb of the main body, we no longer have control over the main body, which may

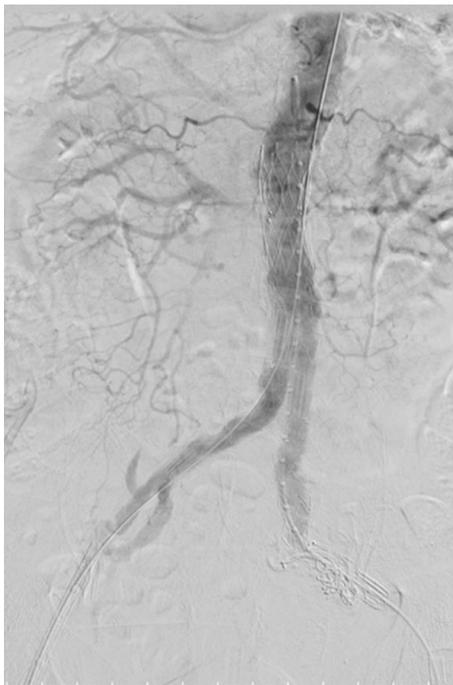


Figure5: Final result of EVAR

result in migration/movement of the main body during contralateral limb insertion and deployment.

Dang et al. [4] have described that the base of the right iliac artery is anterior frequently in comparison with the left side. The cannulation

period of the contralateral limb is shorter when the main body stent is inserted from the left.

Dattani et al. [5] and Po-Ying Lee et al. [6] have described that limb crossing is a good procedure for contralateral limb safe cannulation during EVAR in the anatomical hostile of the aorta, but it needed repositionable stents and new-generation devices.

Maleux et al. [1] showed another cross-over procedure by using a microcatheter and micro guidewire. They explained this technique is a worthy option in a challenging EVAR.

Mazzaccaro et al. [2] presented a hypothesis, they demonstrated that the oblique cut of the cross gate increased the surface area available for cannulation. The oblique cut procedure is not suitable for all formats of EVAR devices. The only devices that could withstand this change were Ovation, Incraft, and Treovance.

Conclusion

Based on studies and articles, the following methods are used in Gate Cannulation During EVAR:

- Conventional method (contralateral gate cannulation)
- Left brachial or axillary artery access
- Limb crossing
- Microcatheter with micro guidewire
- Oblique cut of the cross gate
- Cross-over Ipsilateral Side

We have used a technique that we have rarely seen similar to, we hope to be reviewed in reputable and advanced centers.

It seems that in the future, Gate Cannulation During EVAR will be classified and used according to the patients' clinical condition and aneurysm anatomy.

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