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*Case Report*

# Image-guided translumbar type II endoleak repair: A novel approach

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## ABSTRACT

We present a case of a 72-year-old male with an abdominal aortic aneurysm status post-endovascular aneurysm repair (EVAR). Follow-up imaging demonstrated an enlarging type II endoleak and attempts at transarterial coil embolization of the inferior mesenteric artery were unsuccessful. The patient underwent image-guided percutaneous translumbar type II endoleak repair using XperGuide (Philips, Andover, MA USA).

**Keywords:** Abdominal aortic aneurysm, Endoleak, Type II

## INTRODUCTION

Endovascular aneurysm repair (EVAR) is the treatment of choice for abdominal aortic aneurysms (AAA). One of the post-operative complications encountered after EVAR is an endoleak. Endoleak is where blood flow remains to the excluded aneurysm sac. Type II endoleak is the most common type of endoleak and accounts for approximately 40% of all the endoleaks.[1] Deciding on the treatment option for a type II endoleak has been controversial and different institutions opt for different methods. A transarterial approach with embolization of the feeding vessel to the aneurysm sac is usually sufficient.[2-3] If that approach fails, a percutaneous translumbar approach is taken. This case report demonstrates a percutaneous translumbar approach using XperGuide (Philips, Andover, MA USA) to treat an enlarging type II endoleak.

## CASE REPORT

A 72-year-old male with a medical history significant for a large saccular type infrarenal AAA, which measured approximately 5.6 cm × 4.8 cm by CT scan criteria had undergone percutaneous EVAR with a unibody stent-graft placement (Endologix, California, USA) and placement of proximal aortic extension cuff by vascular surgery in 2016. Follow-up imaging in 2018 demonstrated a type II endoleak with an enlarging aneurysm sac measuring 6.8 cm × 5.8 cm [Figure 1]. The patient followed up with vascular surgery and they attempted a transarterial coil embolization of the inferior mesenteric artery. Intraoperatively, vascular surgery was not able to demonstrate the type II endoleak, and the patient was referred to interventional radiology for further treatment. The patient was seen in the IR clinic and the option of direct glue or coil deposition into the aneurysmal sac was discussed with the patient. The patient demonstrated

understanding of the risks and benefits and wanted to proceed with the procedure.

Due to the need for prolonged prone positioning, the patient was intubated under general anesthesia and placed in the prone position on the angiography table. Preliminary images were obtained using XperCT 3D reconstruction software (Philips, Andover, MA USA). Percutaneous translumbar approach into the aneurysmal sac through a left paravertebral approach using XperGuide was calculated [Figures 2 and 3]. The patient was then prepped and draped in the usual sterile fashion. A left translumbar approach was selected. Under intermittent fluoroscopic guidance and XperGuide, the aneurysm sac was accessed with a six French Accustick set (Boston Scientific, USA). Using a four French Kumpe catheter (Angiodynamics, USA) and a 0.035 hydrophilic Glidewire (Terumo, Japan), the catheter was directed to an area of flow within the sac. DSA images were performed of the aneurysmal sac which demonstrated the endoleak emanating from the inferior mesenteric artery [Figure 4]. Attempts were made to cannulate the inferior mesenteric artery using the Kumpe catheter and Glidewire and subsequently multiple microcatheters such as Progreat (Terumo, Japan) and microwires such as Double Angle GT wire (Terumo, Japan). However, this proved to be unsuccessful. Using the Glidewire, the Kumpe catheter was parked in proximity to the ostium of the inferior mesenteric artery. Once the catheter was in a satisfactory position, two detachable 0.035 coils and 3 ml of cyanoacrylate glue

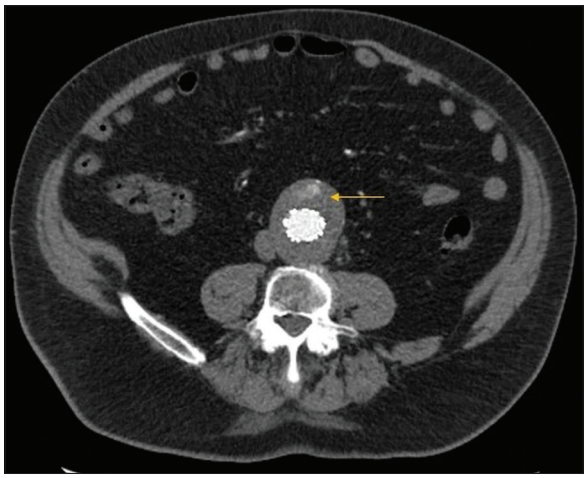

**Figure 1:** 72 year old male with AAA s/p EVAR. Follow up contrast enhanced axial CT imaging of the abdomen demonstrates hyperattenuation in the native aneurysm sac at the origin of the inferior mesenteric artery (arrow) consistent with type II endoleak.

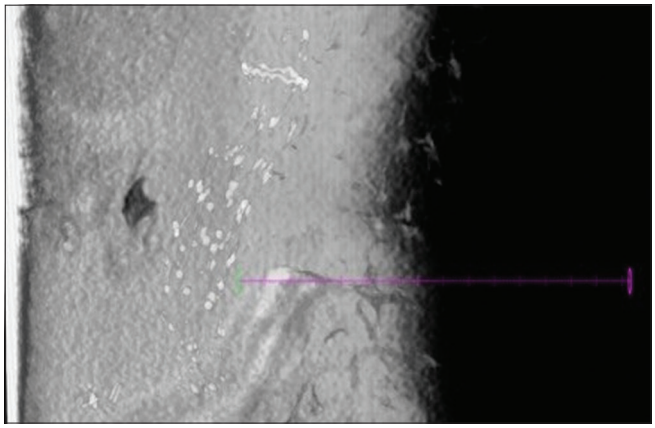

**Figure 2:** 72 year old male with AAA s/p EVAR. Follow up contrast enhanced axial CT imaging of the abdomen demonstrates hyperattenuation in the native aneurysm sac at the origin of the inferior mesenteric artery (arrow) consistent with type II endoleak.

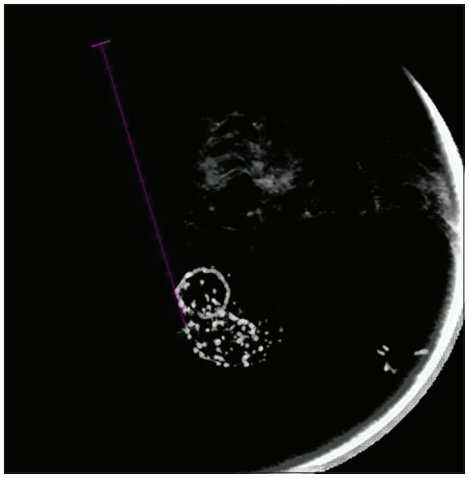

**Figure 3:** 72 year old male with AAA s/p EVAR with an enlarging type II endoleak. XyperGuide is used to plan the approach into the aneurysm sac in the axial plane. The pink line is super imposed on the screen during live fluoroscopy and is used as a guide while advancing the needle.

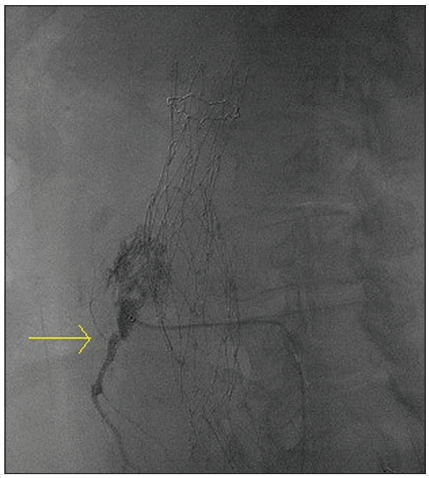

**Figure 4:** 72 year old male with AAA s/p EVAR with an enlarging type II endoleak. Angiogram from a catheter in the native the aneurysm sac demonstrates filling of the inferior mesenteric artery (arrow).

mixed with ethiodized oil were placed into the aortic aneurysmal sac near the origin of the inferior mesenteric artery [Figure 5]. After satisfactory filling of the sac was achieved and lack of flow was seen in the parent catheter, the catheter and introducer were removed. XperCT was performed, demonstrating coils and glue looped within the native aneurysmal sac adjacent to the origin of the IMA. A small amount of glue was noted along the translumbar subcutaneous tract. Hemostasis was achieved with manual compression. The patient was then transported to the post-operative anesthesia care unit. The patient tolerated the procedure well and made an uneventful recovery.

## DISCUSSION

When type II endoleaks are encountered on follow-up imaging after an EVAR for AAA, the management of the endoleak varies from close interval follow-up to transarterial or percutaneous treatment. Type II endoleaks with enlarging aneurysm sac are an indication for treatment; however, there is no specific guideline available as to the treatment method. The transarterial route with embolization of the feeding vessel is a known method of approach.[6] Translumbar approach using fluoroscopic and CT guidance has also been described in the literature.[7,8] These methods employ landmarks gathered from prior imaging, and the needle is placed into the aneurysm sac under fluoroscopy. We describe the use of XperGuide, a live 3D guidance tool. Using this novel technique, CT, such as images, is acquired and reconstructed into a 3D model. These images are used to plan and guide the trajectory of the needle during the procedure. XperGuide allows the path of the needle to be evaluated in real-time as the live fluoroscopy image is superimposed on the proposed XperCT image.

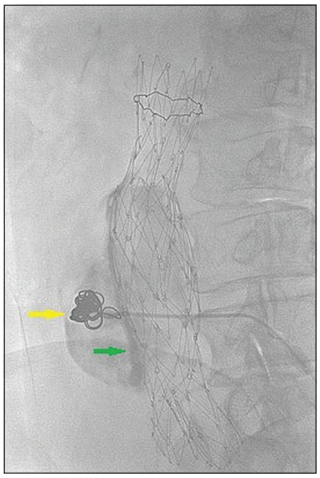

**Figure 5:** 72 year old male with AAA s/p EVAR with an enlarging type II endoleak. Embolization coils (yellow arrow) are seen adjacent to the origin of the inferior mesenteric artery. Cyanoacrylate glue was also injected to occlude the feeding vessel (green arrow).

The operator has real-time feedback if the needle deviates from the proposed path and appropriate adjustments can be made. This method is more accurate in gaining access into the aneurysm sac and avoiding puncturing the endograft and other critical structures. XperCT provides great spatial resolution, while XperGuide provides real-time needle placement. This method can be used for various other procedures such as biopsies and drainages.

## CONCLUSION

Advancements in the field of interventional radiology are constantly being made and XperGuide is a perfect example. Historically, the translumbar approach to treating type II endoleaks involved accessing the aneurysm sac under fluoroscopy or CT guidance using landmarks; however, the path of the needle was not in real-time. XperGuide provides real-time trajectory of the needle and provides constant feedback to the operator and is a great tool for safe and effective access for treatment of type II endoleaks.

### Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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