

## Case of Juxtarenal Abdominal Aortic Pseudoaneurysm Repaired Endovascular Using Chimney Graft Using Off Labeled Device

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### Abstract

Abdominal aortic aneurysm (AAA) is a significant vascular condition in which a segment of the aorta becomes dilated below the diaphragm. Normal diameter is regarded to be less than 3 cm. According to various studies, the size threshold for operative treatment is usually 5 to 5.5 cm with asymptomatic patients. According to Brown., *et al.* [1], the diseased segment can grow to much larger sizes and in extreme cases can rupture catastrophically, resulting to fatal consequences reaching up to 80% mortality.

We describe a case of a 30 year old, Filipina female diagnosed case of juxtarenal AAA who presented with severe back pain and underwent exploratory laparotomy, aborted open approach and eventually endovascular aortic repair (EVAR) using chimney graft technique last October 2013.

**Keywords:** Abdominal aortic aneurysm; Chimney Graft; Angiography

### Introduction

For the surgical treatment of abdominal aortic aneurysm, there are currently two main methods of repair: the traditional open and endovascular. Moulakakis., *et al.* [2] mentioned that the open surgical repair was first performed in the late 1950s and is still more commonly done, but endovascular approach is catching up for the recent years. It has emerged as good alternative with established safety and efficacy for very high risk patients than conventional open repair. This new treatment has lower operative mortality, faster recovery time, shorter hospital stay and with less requirement for high-dependency care.

However, its application is limited due to challenging anatomical structures especially with inadequate landing zones [2].

In 2012, Greenberg said that modified stent grafts such as fenestrated and branched, were developed to surmount these anatomic restrictions. However, both types of graft cannot be used in an urgent setting as they require time for manufacture.

Greenberg., *et al.* [3] was the first to suggest the “chimney” or “snorkel” graft technique to preserve renal arteries during endovascular aneurysm repair (EVAR) when the proximal edge of stent graft would protrude into the renal artery ostium. Over the recent years, modification of this technique has broadened in the treatment of various aortic aneurysms.

The case that will be presented used a chimney or snorkel graft endovascular technique to address the urgent setting of an aneurysmal leak.

### Clinical Presentation

Patient A. G. is a 30 year old female who intermittently presented with lower back pain more on the left for 10 months last 2013. No consult was done until one month prior with noted increased severity accompanied by blood pressure elevations (Usual 90-100 SBP to 140mmHg). Her past medical history was insignificant with history of polycystic ovaries and allergies to penicillin and ibuprofen. Her social history was unremarkable with no consumption of

tobacco or alcohol. Family history showed hypertension on mother side. Vital signs were within normal limits and her physical exam was significant for CVA tenderness on the left.

CT stonogram was done which revealed lobulated, retroperitoneal mass with poor interface with the aorta and obscuring the left renal artery, at the level of T12 to L2 (See figure 1). CT angiography was then suggested.

**Figure 1:** CT stonogram plain.

Contrast studies then showed a saccular, narrow-necked aneurysm (3.6 x 3.8 x 6.1 cm with a 1.1 cm neck width) arising from the abdominal aorta, at the junction of the aorta and left renal artery take-off (See Figure 2). This was accompanied by extensive soft tissue density seen adjacent to this lesion and surrounding the left renal artery, possibly representing a chronic inflammatory fibrosis. Left renal artery stenosis secondary to extensive chronic inflammatory changes associated with the abdominal saccular aneurysm to pseudoaneurysm with resultant decreased renal perfusion and renal parenchymal contraction. Anaortic leak at the juxtarenal/left renal portion of the aorta was noted with extravasation forming a hematoma (3 cm widest diameter) (not a dissection).

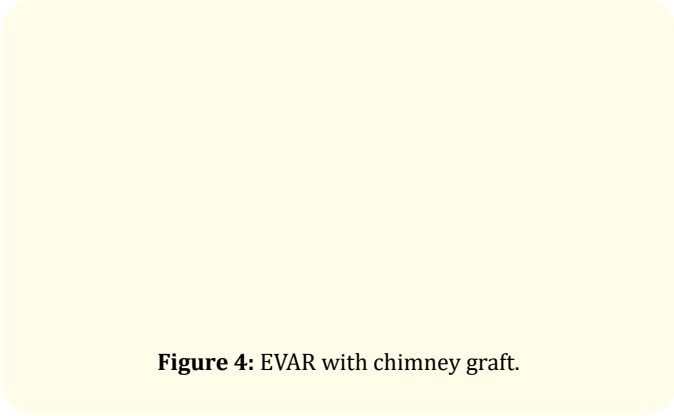
GFR scan was done which revealed hardly visible left kidney with most function mainly taken up by the right (Left 20.6%, Right 79.4%). CT aortogram was then requested to rule out other aortic abnormalities and to check the previous aneurysmal leak. It showed normal thoracoabdominal aorta besides the previously disease segment with no significant change in aneurysmal size and hematoma (Figure 3).

**Figure 2:** CT angiography of the whole abdomen.

**Figure 3:** CT aortogram.

Patient then underwent exploratory laparotomy for repair of leaking aneurysm. However operation was aborted after 3 straight hours due to severe dense adhesions encompassing supra and infrarenal aorta with friable aortic tissue near the area of the aneurysm. It was noted at this time that there was no active bleeding or expansion of the hematoma.

Plan at this time was to manage the patient conservatively with blood pressure control and tranexamic acid while waiting for the endovascular graft. CT aortogram was then repeated a day prior to schedule endovascular repair which showed no significant change in the size of the aneurysm and hematoma. Serial cbc monitoring was also noted to have stable hemoglobin.



**Figure 4:** EVAR with chimney graft.

After four days since the open surgery, patient underwent endovascular repair with chimney graft technique using Endurant Iliac Limb and Express LD stent grafts. Final angiogram post procedure showed good flow to the right chimney graft and aortic stent graft (See figure 4), visualized superior mesenteric artery and a small type 4 endo leak probably to graft porosity and heparinization. Rest of the hospital days were unremarkable. Repeat Ct scan on follow up showed no endoleaks [4,5].

### Discussion and Conclusion

The endovascular repair of abdominal aortic aneurysm is a complex procedure that could involve variety of techniques especially in maintaining visceral artery branches such as with pararenal aneurysm. Chimney-graft technique is a viable alternative for high-risk patients who have a pararenal aneurysms especially in urgent settings.

The Philippines being a Developing country does not have a huge range on Endovascular devices. We don't have access to covered stents like Bard Fluency, Atrium V12 Avanta, Gore Vlabahn.

Given the need for intervention. We decided to use Stent graft for off label use in this particular patient.

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