

## Challenges in the Treatment of Short Neck Abdominal Aortic Aneurysms: Considerations for Durable Correction

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### Editorial

Since 1997 authors classification categories recommended reporting standards for abdominal aortic aneurysms (AAA) repair [1]. To treat juxtarenal AAA, short neck, grade IV based on the length of proximal neck when <1.5 cm, was considered endovascular technical repair difficulties influenced by the anatomy of aneurysm. The proximal aortic neck extends from the most caudal main renal artery to the onset of the aneurysm, morphologic characteristics of the proximal aortic neck influence the effectiveness of aneurysm exclusion and the durability of endograft attachment (**Table 1**) [1,2]. Proximal aortic neck length (L) is scored as follows: 0, L=25 mm; 1, 15<L<25 mm; 2, 10<L<15 mm; 3, L<10 mm [2]. In a multicenter study, compliance with endovascular aortic repair (EVAR) device guidelines was low and post- EVAR aneurysm sac enlargement was high, raising concern for long-term risk of aneurysm rupture and included aortic neck length as one important key anatomic measurements [3].

**Table 1** Definition, grading, and categorization of an initial morphologic state [2].

Attribute	Absent=0	Mild=1	Moderate=2	Severe=3
Aortic Neck				
Length (L)	L>25 mm	15<L<25 mm	10<L<15 mm	L<10 mm

In this sense, the concept that the anatomy of the proximal aortic neck is the most important factor to guarantee durable correction with standard endoprosthesis was created.

Among other parameters, hostile neck anatomy concept was created (**Table 2**) [3]. The UK's National Institute for Health and Care Excellence (NICE) has issued draft guidance on abdominal aortic aneurysm (AAA) diagnosis and management last year. The most notable recommendation within the guideline is related to repairing unruptured aneurysms where the guideline states that patients should not be offered EVAR if open surgical repair is suitable [4]. Regarding this our first consideration for durable

correction is to remember that open surgery is not buried, on the contrary, it's still a possibility of AAA treatment.

**Table 2** Hostile neck anatomy parameters [3].

Proximal aortic neck length <15 mm/10 mm
Diameter of the neck>28 mm
Angulation >60 degrees
Calcium/thrombus >50% of the circumference
Conical taper

Another consideration, taking into account, what is defined in the manufacturers specifications (IFU), Incraft<sup>®</sup>, Endurant<sup>®</sup>, Ovation<sup>®</sup> and Treovance<sup>®</sup> endografts when the angle is ≤ 60°, should be used in a neck of 10 millimeters (mm) or larger, AFX<sup>®</sup>, Excluder<sup>®</sup> and Zenith<sup>®</sup> when the angle is ≤ 60°, should be used in a neck of 15 mm or larger, Anaconda<sup>®</sup> and Aorfix<sup>®</sup> when the angle is ≤ 90°, should be used in a neck of 15 mm or larger. Respect all those specifications is to avoid complications as migration, Type I endoleak, aneurysm sac enlargement and rupture with high risk of death.

Why not use specific or dedicated endoprosthesis to treat AAA? When the neck is ≥ 4 mm or ≤ 10 mm, we can treat our patients using the chimney graft technique, fenestrated or branched stent graft implantation, the anatomy of the proximal aortic neck is the most important factor to ensure durable correction with standard endoprosthesis, so hostile anatomy is proximal aortic neck length <15 mm or 10 mm, diameter of the proximal neck >28 mm, angulation >60 degrees, calcium or thrombus >50 % on the circumference area and conical taper are predictors of complications, sac enlargement after EVAR [1-3]. Authors agree that anchors may avoid wide infrarenal necks and thrombus on sac regression, although more studies are necessary to evaluate the follow up of this kind of technical resource [5]. Sac regression in patients implanted EndoAnchors was significantly higher [5].

In conclusion, on cases of hostile neck, we must check the IFU and analyze each one, because there is a greater risk of endoleak type I, balance the risks and evaluate fenestrations, chimneys or conventional surgery, individually. I am optimistic that we've viable and safe options for endovascular treatment of patients with challenging aortic anatomies including short necks, as well as a solution to reduce the incidence of complications such as type I endoleaks, kinking, and migration which are related to aortic sac rupture and death [1-5]. More Randomized Controlled Trials (RCTs) are necessary and different technical alternatives for endovascular treatment depend directly on the anatomy of the proximal neck and the sealing area. AAA proximal neck should not be negotiating, it has to be sealed.

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