EDITORIAL

Current and future perspectives on endovascular treatment of para and juxtarenal AAA

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In spite of the differences in definition of para- and juxta-renal abdominal aortic aneurysms (p-/j- AAA), the recent ESVS guidelines equate both concepts*: an aneurysm extending up to but not involving the renal arteries, necessitating suprarenal aortic clamping for open surgical repair (i.e. a short neck <10 mm)*[1]. There is a prolific literature concerning the treatment of jAAA, because it is one of the most challenging situations in vascular surgery commitment: exclusion of the aortic aneurysm avoiding impairment of visceral function[2,3].

Open surgery has traditionally been the standard treatment, via transabdominal or retroperitoneal approach, and necessitating suprarenal clamping and eventual transection of the left renal vein. Despite good mortality rates (as down as 4.1% 30-day or in-hospital mortality, following some systematic reviews)[1,2], these good results have only been achieved in fit patients, at high volume and dedicated centers, and tolerating a considerably high morbidity. Open repair is not possibility for all vascular surgery departments. Therefore, endovascular treatment (EVAR) of jAAA rose not only in order to improve these considerably good mortality rates, but to decrease morbidity and to extend the treatment of jAAA to unfit patients for open surgery and to centers with lower volume and expertise in open surgical repair of complex aneurysms.

There are no randomized trials comparing open and endovascular treatment of jAAA (and probably there will not be), so direct comparisons are not possible. And in spite of treating more comorbid and unfit patients with endovascular techniques, a recently published meta-analysis[2] comparing open and endovascular repairs and analyzing almost three thousand treated cases, concluded that there were no significant differences in 30-day mortality (3.3% for fenestrated EVAR [fEVAR] vs 4.2% for open repair), with lower morbidity (renal insufficiency, major early complication) but higher late re-intervention rate (11.1% vs 2.0%) for fEVAR. It has to be read as a success: endovascular surgery is able to obtain comparable, if not better, short-term results in worse condition patients.

Concerning endovascular treatment options, fEVAR should be considered as the first option, due to their reported safety and efficacy, and plentiful published evidence[1,2]. However, there are severe anatomical requirements: endograft availability and manufacturing can be delayed up to 8 weeks (except for the uncommon off-the-shelf devices), iliac access limitations, patent aortic lumen diameter and angulation, number of fenestrations and visceral vessels anatomy and orientation. Some of these limitations can be overtaken with bEVAR (branched EVAR), with internal or external branches, or in combination with fenestrations, which can allow deployment of the bridge stents through brachial access after endograft deployment, avoiding some fEVAR limitations like stenotic iliac access, wide aortic lumen, downward pointing of the visceral vessels, or more off-the-shelf available devices for emergency cases. However, it is more commonly used for thoracoabdominal aneuryms (TAAA) and there is less strong published evidence and a tendency towards worst results than conventional fEVAR, probably due to failing longer bridge stents, with a higher rate of thrombosis and type III endoleaks. Moreover, bEVAR is still subjected to important common limitations like availability, one wide iliac access is required with additional subclavian access, visceral vessels without prompt bifurcations and downward orientated[4].

When these alternatives are not feasible for any reason, parallel graft or chimney technique (chEVAR) appears as a very valuable alternative. In spite of some anatomical limitations (preferably not more than 2 downward pointing visceral vessels) and some concerns related to gutters, it can be used in narrow iliac accesses and in emergency setting[5].

In the near future, we will probably see a simplification of jAAA endovascular planning, increasing the number and competence of the off-the-shelf devices and decreasing or eliminating the manufacturing delays. Smaller profiles, pre-cannulated devices and multiple branch designs can help to advance in this endovascular era. But, beyond endograft perfection, an improvement in bridge stents design is mandatory because it is one of the main causes of bEVAR and fEVAR failure. Actually, some companies launched im-

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provements in their bridge stents shapes and radial forces (BeGraft+ platform [Bentley InnoMed, Hechingen, Germany], Gore Viabahn VBX [GORE Flagstaff, AZ]), but their superiority or mid-term durability has not been demonstrated. Bridging stents are the Achilles heel of endovascular treatment of juxtarenal and thoracoabdominal AAA, and until dedicated stentgrafts are designed, it won't be possible to give fEVAR the definitive strike against jAAA.

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