

# Advances in Vascular and Endovascular Surgery in 2016

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We mainly refer to advances in concept, notwithstanding the advances of technique and materials. Historically the endovascular procedures had a great advance since the 90's, mainly related to the development and improvement of techniques for treatment in all levels of the thoracoabdominal aortic aneurysms. From then on, there was a worldwide explosion in the dissemination of knowledge with a solid basis for updating the concepts, new techniques such as embolization or endovenous therapies besides new materials. We will make a brief summary of some highlights in 2016.

Carotid Revascularization Endarterectomy versus Stenting Trial (CREST) now report the results extended out to 10 years and concluded that stenting versus endarterectomy for carotid-artery stenosis rates of ipsilateral stroke did not differ [1]. NEJM published a trial involving asymptomatic patients where stenting was non-inferior to endarterectomy also [2]. The Asymptomatic Carotid Trial and the CREST showed that after the perioperative period, there was no difference in the rate of late ipsilateral stroke after both procedures [1-3].

The proximal landing zone is a limitation to obtain an adequate seal zone in the Endovascular Aortic Aneurysm Repair (EVAR) and open abdominal aortic aneurysm repair is still necessary in an era of advanced endovascular procedures [4]. However authors suggest now Fenestrated EVAR (FEVAR) as a first line strategy to treat short necked, juxtarenal, and suprarenal aneurysms [5], despite the line curve to achieve a high technical success and a low operative mortality rate [5,6]. Expanding the landing zone for treating abdominal aortic aneurysms, the development of different type of endoprosthesis and extension allowing the treatment of more complex abdominal aorta aneurysms in any segment and technology evolution from large profile endoprosthesis to low profile endoprosthesis implantable percutaneously is a tremendous breakthrough in the current era.

Relevant studies about endovascular repair of Thoracoabdominal Aortic Aneurysms (TAAAs) using fenestrated and branched endografts asserted that it can be performed with high technical success and low mortality and morbidity, however long-term follow-up is needed and high rate reinterventions was observed because of endoleaks [7].

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Outcomes with supraceliac sealing zones to treat juxtarenal and TAAAs concluded that Fenestrated and Branched Endovascular Aortic Repair (F-BEVAR) are safe and can be performed with excellent early outcomes [8].

Another significant advance remains controversial, however studies indicate that *in situ* repair should be offered using either autologous veins or cryopreserved allografts to treat aortic endograft infection [9,10]. With increased use of EVAR the infection incidence can go up to 3% [10].

Regarding clinical practice the largest advancement of the last decade and 2016 was endovenous surgery than I will highlight two points that I consider to be the main ones in this year. First of all, venous compression syndrome studies statistically increased. Stenting for the treatment of Nutcracker Syndrome (NCS) is growing with favorable results with regard to primary stenting [11]. A novel open surgery for pelvic congestion syndrome caused by NCS was recently reported, transposing the distal left ovarian to the left external iliac vein, it is simple avoiding the use of prosthetic materials or stents and experience sustained relief of symptoms [11,12].

Early data suggest but not validate that; imaging-guided, catheter-based therapy can eliminate iliac vein obstruction and saphenous

venous valvular reflux, resulting in reduced Post-Thrombotic Syndrome (PTS) severity. Vedantham et al summarizes the findings of a multidisciplinary panel to plan a multicenter randomized trial to evaluate endovascular therapy for the treatment of advanced PTS [13]. They concluded 12 recommendations, the main ones being: Endovascular therapy (Iliac vein stent placement followed by ablation of saphenous reflux) and all patients use compression therapy (mainly graduated stockings) [13]. Venous evaluation to treat patients with severe stenosis generally is done with ascending phlebography or Intravascular Ultrasound (IVUS). In addition to these important articles on venous disease, Archer proposed a new venographic classification findings that can treat more than two-thirds of the patients, with a more economical and successful approach than IVUS [14].

An article published exposes a reasoning approach for patients with peripheral arterial disease that need to assess arterial perfusion; percutaneous therapies continue to evolve with longer follow-up with randomized data and larger prospective registries [15]. Data showed that novel devices such as drug-eluting stents, drug-coated balloons have improved patency, others to cross chronic total occlusions or reduce or modify the anatomy of the plaque [15,16]. Tools as intravascular ultrasound have highlighted the need for better stent selection. The angiosome

notion optimizing reperfusion and endovascular treatment of the pedal loop have been advocated for improved results, associated with technical advances such as reentry methods allowing crossing difficult lesions that were insurmountable [15]. A study catches our attention to research in vascular disease about time dependent differences of plaque characteristics towards a less lipid rich lesion or with less intraplaque hemorrhage; therefore, the benefit of revascularization may change over time [17].

About future prospects in vascular procedures, Veith concluded, in his eleventh Homans Lecture this year "Vascular surgery can then fulfill its potential for a brighter future. More importantly, patients and society will be the ultimate beneficiaries [18]".

## Conclusion

Marvelous advances have been made, technology has enabled us to advance every year, so it is a risk trying to anticipate how vascular surgery will be in 20 years, since the procedures we perform today are completely different from those performed twenty years ago but vascular diseases are the same. They are significant contributions that make science advances in the search for improvement in the health of the reducing complications of vascular diseases.

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