Editorial

https://doi.org/10.4070/kcj.2017.0002
Print ISSN 1738-5520 • On-line ISSN 1738-5555

kcj
Korean Circulation Journal

A Great Start, but the Long-Term Durability Remains to be Demonstrated

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Refer to the page 215-221

In this issue, Park et al.[1] present their experience with the use of a novel, fenestrated aortic arch stent graft (FASG) with a preloaded catheter for supra-aortic vessels. The authors have done an outstanding job highlighting a subject of increasing importance in acute clinical care, namely, performing thoracic endovascular aortic repair (TEVAR) in a short landing zone for aortic arch pathology. Although TEVAR is an effective therapy for various aortic arch pathologies, particularly in patients with a high operative risk or an emergent condition, the involvement of supra-aortic vessels limits the application of TEVAR.[2][3] Operators have modified a standard device by on-table creation of fenestrations and markers. The use of such operator-modified devices offers an opportunity for expanded technology usage.[4] Inoue et al.[5] were the first to introduce the endovascular technique for aortic arch repair. To date, some reports on the use of fenestrated stent grafts for aortic arch pathologies have been published.[6][7] But, those types of fenestrated stent grafts were reported to have inaccurate deployment and stent graft migration risks. Moreover, the fenestrated site may be difficult to accurately fit into supra-aortic vessels. Contrary to the aforementioned devices, this new FASG has a preloaded catheter which allows an additional guidewire for advancement into supra-aortic vessels in advance, and makes it easier to deploy the stent graft without enhancing the risk of stent graft migration.

Several issues in the present study should be addressed. First, this study was not conducted in diseased human aortas, but in healthy pigs whose aortas were free of significant enlargement or dissection. The anatomy of supra-aortic vessels in pigs and humans is fundamentally different. However, no diseased aortic arch experimental models have been developed due to technical difficulties, while several abdominal aortic aneurysm models have already been used. Second, this FASG is likely to be appropriate for aortic arch pathologies that are adjacent to the lesser curvature. This is especially true where supra-aortic vessels take off at narrow intervals or branch from an acute angulated aortic arch. If this FASG is applied in an aforementioned aortic arch pathology in the greater curvature, there is a high possibility that endoleaks from the supra-aortic vessels might occur, causing serious pressure overload between the aortic wall and the implanted stent graft. Other important unknowns regarding this FASG are its ability to provide sustainable patency and strong radial force without serious complications. In this study, the authors have demonstrated that excellent short-term results can be achieved using this FASG in 10 pigs.[1] In the literature, the risk of cerebral infarction seems to be higher after placement of a stent graft with a side branch, especially when it involves the brachiocephalic and left common carotid arteries.[6-8] At the present time, the most popular method is termed 'hybrid' therapy and involves prophylactic transposition or bypass graft placement to provide flow to the brain or arms.

This FASG is a promising device for aortic arch applications. We strongly suggest that this FASG might be the best choice for a patient with traumatic aortic arch dissection that is located in the lesser curvature with a healthy proximal short landing zone. The long term feasibility, durability and safety of this FASG remain to be addressed in future human studies.

Received: January 4, 2017
Accepted: January 18, 2017
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• The authors have no financial conflicts of interest.

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