Reviewer’s report

Title: Debranching thoracic endovascular aortic repair for distal aortic arch aneurysm in elderly patients aged over 75 years old

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Reviewer: Claudio Francesco Russo

Reviewer's report:

The Author of the present paper makes a comparative analysis of TAR vs. TEVAR with previous debranching for the treatment of distal aortic arch aneurysms. The results of TAR reported in literature are extremely encouraging and invite surgeons to treat aortic arch aneurysms by open surgery. A recently published meta-analysis focusing on TAR reported an operative mortality (including urgent cases) of 5.3% and a rate of permanent neurologic deficit of 3.4% (J Vasc Surg 2016;63:537-45). However, in highly selected cases, alternative techniques like TEVAR with previous debranching may be considered. A recent Japanese paper from Dr. Okita, reported an increase mortality among patients > 80-year-old (JTCVS, 2019 Aug 25, in press).

I congratulate the Author for the outcome of the present series, 0% operative mortality in arch surgery is, to my knowledge, an unreported result.

However, there are some major and a few minor issues to be discussed:

Major issues:
1. Although the Author performed a PS matching for making the 2 groups more homogenous and comparable, the number of patients for each group is too low (17 pts), so that the statistical power of the study is extremely weak. As a matter of fact, although the rate of cerebral infarction was about twice as high in the TEAVR group (11.7% vs. 5.8%), the data didn't reach the statistical significance. Moreover, the Author presents the results at 5 years, but the analysis of the KM curves shows that, at that particular time of FU the number of patients at risk for the TAR and TEVAR groups are 10 and 2, respectively. With those numbers, neither definitive nor even partial conclusion can be drawn. Nevertheless, in the "Conclusions" the Author states that debranching TEVAR could be the first line therapy for aortic arch aneurysm in the elderly.
2. The criteria for fixing the age cut-off at 75 years are missing. Moreover, this threshold is questionable. In literature, although no guidelines for the definition of "elderly" patients is defined, the cut-off is usually 65 years.
3. The description and details of the statistical analysis regarding the PS matching are completely missing.

Minor issues:
a) The time frame of the series is 2008-2015. No indication regarding the time frame between 2015 and 2019 is reported.
b) The Author reported in "Methods" that patients were indicated for surgery if thoracic aneurysm was ≥ 60 mm. The ESC guidelines 2014 focusing in aortic disease suggests to treat aortic arch aneurysms when the diameter exceeds 55 mm and this data is largely accepted by the scientific community. Although in elderly patients this threshold may be increased, the reasons should be
discussed in details.
c) Cerebral complications following aortic surgery should be reported as follows: permanent neurologic deficit and transient neurologic deficit.
d) Although the data didn't reach the statistical significance, and this is probably due to the small sample size, the rate of cerebral infarction was about twice as high in the TEAVR group when compared to the TAR group (11.7% vs. 5.8%). This trend is quite clear and should be largely argued in the "Comment".
e) The limitations of the study are not reported.

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