

2 Peer-review report

Reviewer #1: Comment #1: please describe the differences between the information obtained with intravascular ultrasound and CT. Can CT replace IVUS?

Thank you for your comment.

Intravascular ultrasound (IVUS) is an imaging technique that uses a transducer or probe to generate sound waves and produce pictures of the insides of blood vessels.

With IVUS we can obtain more information about the vascular lumen, including the location of dissection entry tears. We can use IVUS to indicate the location of the entry of false lumen in real time and guide the wire during TEVAR operation. Therefore, we believe that IVUS has some advantages over CT image.

Reviewer #2: Nice report . The authors should discuss the option of debranching (graft from the ascending aorta to the neck vessels) and then deploying the and why they did not The authors should discuss how they created the LEFT-RIGHT carotid anastomosis (details please) and timelines to the endovascular approach The modeling is helpful but is scalable . Most hospitals dont have such modelling ,can the authors recommend other approaches other radiological signs base don our standard CT scan to detect Multichannel aortic dissection.

Thank you for your comment.

Generally, for debranching technique, if the aortic dissection involved the innominate artery, graft from the ascending aorta to the neck vessels was performed. In this case, because the left common carotid artery had been involved by aortic dissection, the aortic covered stent should cover the left common carotid artery, otherwise there would be a risk of endoleak. At the same time, the innominate artery and the right common carotid artery can be preserved because the innominate artery is not involved by aortic dissection. Therefore, the surgical strategy was to do the right common carotid artery - left common carotid artery bypass, and then perform TEVAR surgery, and deployed the aortic covered stent just adjacent to the innominate artery distally.

We made a longitudinal incision on both sides of the neck to expose the left and right common carotid artery, then the end-to-side anastomosis was made from the the artificial graft to the left common carotid artery. After the graft was tunneled from the left side to the right side, the end-to-side anastomosis was performed on the right common carotid artery. After successful anastomosis, the incision was closed, and then TEVAR was performed via the femoral artery approach. The stent graft was precisely deployed within the aortic arch just adjacent to the innominate artery distally. We have revised the case description and discussion part in our manuscript according to your advise. Please check it.

Your recommendation on how to detect MCAD based on standard CT scan is very helpful. MCAD was defined as AD with more than two FLs on contrast-enhanced computed tomography (CT) images. Based on standard CT scan, a secondary FL may develop on the lateral wall of the first TL, which has a “true-false-false” or “false-false-true” lumen configuration. A secondary FL may also exist on the other side of the TL,

which has a “false-true-false” lumen configuration. This morphology may often cause full TL collapse, because the TL, which had a small channel, was severely compressed by two isolated false lumens^[1].

References:

- [1] GUO B, HOU K, GUO D, et al. Outcomes of thoracic endovascular repair for type B aortic dissection with multichanneled morphology [J]. *Journal of Vascular Surgery*, 2017, 66(4): 1007-1017.