Trans-arterial treatment of type II endoleak after endovascular repair of abdominal aortic aneurysm: a case report

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Case presentation:

A 57-year-old man with a past medical history of coronary artery bypass graft (CABG) 7 years prior to his admission who developed intermittent claudication and dyspnea on exertion (NYHA class III) since 6 months before his admission. His coronary risk factors included: hypertension, smoking and hypercholesterolemia.

Coronary angiography showed patent grafts and aneurysmal abdominal aorta (AAA). CT angiography revealed AAA (transverse dimension = 6.9 cm, length = 8.1 cm) and aneurysm of right common iliac artery (transverse dimension = 4.4 cm, length = 5.2 cm). Endovascular aneurysm repair (EVAR) was performed successfully.

During routine follow-up, 12 months after the procedure, his CT angiography revealed the presence of relatively large type II endoleaks (5 mm×22 mm) at right anterolateral and posterior aspects of aneurysmal sac arising from inferior mesenteric and lumbar arteries.

Multiplanar reconstructions showed small branches connecting the superior mesenteric artery (SMA) to the inferior mesenteric artery (IMA) through a marginal artery. Under general anesthesia, 6F arterial sheath was inserted into the right femoral artery. After placement of RDC guiding catheter, a workhorse long guide wire (BMW 300mm) selected for crossing into the endoleak retrogradely. Selective angiogram identified filling of the aneurysm sac via the IMA (Figure 1, A). Wiring started from proximal part of superior mesenteric artery (SMA) through middle colic artery (Figure 1, B) and subsequently into the Riolan arch (Figure 1, C) and advanced into the inferior mesenteric artery (IMA) and finally into the site of endoleak adjacent to the posterolateral part of the aneurysm, beneath the grafted aortic stent (Figure 1, D).

Then an over the wire microcatheter (FineCross MG Terumo®) advanced through the wire into the IMA. Embolization was carried out into the microcatheter with usage of 30cc of a nonadhesive liquid embolic agent, Onyx (Ethylene-vinyl Alcohol Copolymer). Onyx injected slowly right after DMSO and once it is delivered outside of the microcatheter, it tended to precipitate (not to polymerize like glue), occupying the target area space slowly (Figure 1, E). To have full control and visualization during the Onyx delivery, road-mapping capability used. Angiography at the end of the procedure showed acceptable results with no specific complication such as non-target embolization, and the microcatheter getting stuck in the target vessel. 6 month follow up CT angiography revealed no aneurismal leakage.

In this case report, we presented our experience with embolization with Onyx co-polymer, using a percutaneous transarterial approach for the treatment of type II endoleak. To our knowledge, this is the first type II endoleak repair with percutaneous transarterial approach in Iran. A significant advantage of Onyx over glue is that it may be injected for a long period (20–60 minutes). In addition, there is low risk of having the microcatheter stuck in the target area as long as the recommended technique is followed. Type II endoleaks can be related with aneurysmal enlargement and rupture; however, this risk is far less than the type I and III endoleaks (0.5% versus 3.4%).

In conclusion, endoleak is an ongoing challenge associated with EVAR. The management of type II endoleaks remains greatly controversial issue in endovascular treatment of aneurysms of abdominal aorta because of various personal experiences concerning the longstanding outcomes of these aneurysms. Whatever the cause of endoleak, a close imaging follow-up is required.