This 73-year-old female, with a history of coronary artery disease and situs inversus, had recently noticed left arm exercise weakness.
The magnetic resonance angiogram and computer tomography of the upper limb vessels showed critical stenosis of the left-side SCA with calcification near the orifice (Fig.1).
Percutaneous revascularization was done via right femoral artery approach, and severe left SCA stenosis was confirmed (Fig.2A) (Supplementary Video 1, only online).
Direct stenting in the left SCA was carried out with a balloon-expansible Express LD 10×25 mm stent (Boston Scientific Corporation, Natick, MA, USA) (Fig.2B) up to 8 atmospheres for 13 seconds.
However, severe shortness of breath and hypotension developed after stenting.
The blood pressure was down to 88/56, and the heart rate was up to 90.
The oxygen saturation was down to 74%.
Emergent intubation, fluid infusion, inotropic agent with norepinephrine were given.
The immediate angiography showed vascular perforation in the stented segment of left SCA (Fig.2C) (Supplementary Video 2, only online).
Emergency balloon inflation within the stent was done with an 8×40 mm balloon.
The cardiovascular surgeon was also consulted.
However, due to the high surgical risk of bypass, endovascular treatment was suggested.
We decided to do a retrograde approach through the left brachial artery by surgical cut-down.
Since there was no suitable graft stent in our cath lab, we modified and cut the iliac extension of self-expanding Endurant II graft stent 10×82 mm (Medtronic, Inc., Minneapolis, MN, USA), which was originally designed to treat abdominal aortic aneurysms (AAA), to a suitable length (around 30 mm) (Fig.3).
After retrograde wiring, an operator-modified Endurant II graft stent was deployed in the stent segment (Fig.2D) and the perforation was sealed successfully.
After stenting of the graft stent, however, slow flow of left common carotid artery (LCCA) was noted, and angiography confirmed the near total occlusion of the LCCA, occluded by the SCA graft stent (Fig.2E) (Supplementary Video 3, only online).
A firm wire (Conquest pro, Asahi Inc, Seto, Japan) was successfully advanced outside the graft stent and into the LCCA.
Despite sequent balloon dilations at the bifurcation site, the flow to the LCCA was still poor.
Intravascular ultrasound also confirmed the severe compromise of the LCCA ostium which was caused by the graft stent (Fig.2F).
Therefore, we put a balloon-expansible carotid stent, Express 7×37 mm (Boston Scientific Corporation), from the LCCA to the left brachiocephalic artery (Fig.4A).
TIMI III flow of the LCCA was restored after stenting (Fig.4B-E) (Supplementary Video 4, only online).
Intravascular ultrasound also confirmed proper expansion of the LCCA stent (Fig.4F).
The follow-up chest radiography revealed left-side hemothorax.
After thoracocentesis with drainage and proper care, the patient was discharged.
Till now, the patient has been free from symptoms for six months.