Post-aortic left innominate vein (PALIV) is a rare abnormality passing over the aortic arch. A 70-year-old male was diagnosed with PALIV and distal aortic arch aneurysm (Fig. 1). Total arch replacement was successfully performed using antegrade selective cerebral perfusion of 20 °C. PALIV was preserved by complete exposure and retraction (Fig. 2).

Fig. 1. Three-dimensional CT: (A) post-aortic left innominate vein (PALIV) and a distal aortic arch aneurysm of 65 mm. PALIV passed in front of the aneurysm, below the aortic arch, and behind the ascending aorta before entering the superior vena cava at the junction with the right atrium.

Fig. 2. Intraoperative surgeon’s view: (A) post-aortic left innominate vein (PALIV) (*) located on the anterior surface of the distal aortic arch aneurysm (An) along the left vagus nerve (arrow), passing in front of the ligamentum arteriosum. (B: after graft replacement) A 26-mm quadrifurcated graft was used for graft replacement. No division of PALIV was required.