A 59-year-old man underwent aortic root replacement with a mechanical aortic valve by means of a classic inclusion wrap Bentall procedure in 1989. He underwent repair of a leaking aortic graft pseudoaneurysm, along with triple-vessel coronary bypass, in 2006. Recent surveillance echocardiography discovered a large echolucent space posterolateral to the aortic root graft. Chest computed tomography (A) and transesophageal echocardiography (TEE) (B, Online Video 1) showed the recurrence of a large aortic pseudoaneurysm communicating with the aortic graft. The patient underwent percutaneous device closure of the pseudoaneurysm communication with a 10-mm Amplatzer septal occluder (AGA Medical Corporation, Minneapolis, Minnesota) (C, Online Video 2, which demonstrates cannulation of the aneurysm with a left coronary diagnostic catheter; D, Online Video 3, which shows the Amplatzer device in position). The device was in close proximity to the left main coronary artery; however, no ischemia occurred because grafts to the left coronary artery were patent. Successful placement was confirmed by 3-dimensional (3D) TEE (E, Online Video 4), with trivial residual flow seen on en-face color 3D TEE (F, Online Video 5). This case demonstrates the novel application of percutaneous device closure technology assisted by periprocedural 3D TEE imaging. (Please see Online Videos 6, 7, and 8 for additional real-time TEE imaging of the guiding catheter and occluder device deployment and positioning.)