Objective(s): Recurrent coarctation of the aorta with associated pseudoaneurysm after previous open repair poses unique surgical challenges. We present a hybrid approach to correct this lesion. Methods: A 64-year-old man was found to have an aortic pseudoaneurysm associated with coarctation at the site of a previous descending thoracic coarctation repair. A high grade stenosis was found at the prior anastomosis with a graft diameter of 12 mm and high pressure gradient. An endograft alone would not achieve an adequate seal in Zone 2 and risked exacerbation of the pressure gradient. A left carotid subclavian transposition was performed first. An ascending aorta to descending aorta bypass with concomitant bypass from the graft to the left carotid artery was performed next. Subsequently, a 34 x 30 x 150 Relay endograft (Bolton Medical, Sunrise, FL, USA) was placed from zone 2 to the mid-descending thoracic aorta. Results: Postoperative CT scan demonstrated completed repair without endoleak. The patient had an uneventful hospital course. Conclusions: A hybrid approach allows for the successful repair of a complex descending aortic pseudoaneurysm with iatrogenic coarctation.