ABSTRACT. During tachycardia, atrial overdrive pacing resulted in entrainment of the tachycardia with an AVA response upon cessation of pacing. Similarly, ventricular overdrive pacing resulted in a VAV response on cessation of pacing. A narrow-complex tachycardia was never observed. These findings were in keeping with orthodromic atrioventricular re-entrant tachycardia during ipsilateral bundle branch block (BBB) using a concealed left-sided accessory pathway. Thus ipsilateral BBB was necessary for induction and maintenance of the SVT, which was manifested as a wide-complex tachycardia because of ipsilateral BBB.

KEYWORDS. Arrhythmias, wide-complex tachycardia.

Case presentation
A 54-year-old man with a history of wide-complex tachycardia (WCT) was brought to the electrophysiology laboratory. His WCT was induced with programmed atrial extrastimuliation (Figure 1). The tachycardia reproducibly terminated with a narrow complex QRS (Figure 2). What is the mechanism of his tachycardia?

Discussion
The patient’s baseline electrocardiogram and intracardiac conduction intervals were normal. Right ventricular (RV) pacing revealed eccentric and non-decremental retrograde atrial activation, in keeping with the presence of a left-sided accessory pathway (AP). At a drive train of 500 ms, an atrial extrastimulus (S2) revealed left bundle branch effective refractory period (ERP) at 310 ms. With an S2 at 270 ms, a WCT with cycle length (CL) of 310 ms and left bundle branch block (LBBB) morphology was induced with a coronary sinus activation pattern identical to that observed during RV pacing (Figure 1). With repeated inductions, the WCT reproducibly terminated spontaneously with a narrow complex QRS “on time” with the tachycardia CL (Figure 2). During tachycardia, atrial overdrive pacing resulted in entrainment of the tachycardia with an AVA response upon cessation of pacing. Similarly, ventricular overdrive pacing resulted in a VAV response on cessation of pacing. A narrow complex tachycardia was never observed. These findings were in keeping with orthodromic AV re-entrant tachycardia (AVRT) during ipsilateral BBB using a concealed left-sided AP. Termination spontaneously occurred with resolution of LBBB, in keeping with dependence on LBBB to facilitate tachycardia. BBB is not uncommonly observed in orthodromic AVRT over ipsilateral accessory pathways. The authors report no conflicts of interest for the published content.

Address correspondence to: Conor D. Barrett, MD, Gray 1, 55 Fruit Street, Boston, MA 02114. E-mail: cdbarrett@partners.org
development of a functional ipsilateral BBB during AVRT leads to a subsequent increase in the conduction time to the corresponding ventricle to reach the pathway. Thus ipsilateral BBB was necessary for induction and maintenance of the SVT, which was manifested as a WCT due to ipsilateral BBB. In our case, the atrial insertion site of the AP was mapped during tachycardia to the posterior location on the mitral annulus and radiofrequency energy was delivered at this site leading to termination of AP conduction. No other arrhythmias were observed.

Reference