

QRS morphologies associated with left bundle branch area pacing

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Introduction: Left bundle branch area pacing (LBBAP) is increasingly used to treat bradycardia and deliver cardiac resynchronization therapy (CRT)¹. During LBBAP, QRS morphology in lead V1 is characterized by a terminal R wave, known as the right bundle branch block (RBBB) pattern; however, different QRS complexes have been described². This study aimed to analyze QRS morphology in lead V1 during LBBAP in patients with bradycardia and CRT after implantation.

Patients and Methods: This study retrospectively reviewed 55 electrocardiograms (ECGs) recorded in the ward, immediately after the LBBAP procedure in consecutive patients with bradycardia (n = 46, 83.6%) and CRT indications (n = 9, 16.4%) from January to September 2025. The morphology of the QRS complex in lead V1 was analyzed to evaluate its features, particularly to distinguish RBBB-like patterns from other morphologies.

Results: RBBB-like pattern was observed in the majority of ECGs (n = 35, 63.6%). The most common morphology within the RBBB-like pattern was "Qr" (n = 15, 42.9%), followed by „QR" (n = 10, 28.6%), „rsR" (n = 4, 11.4%), „qr" (n = 3, 8.6%) and „qR" (n = 3, 8.6%), respectively. Other patterns appeared in two morphologies, mainly „QS" (n = 16, 80.0%) and „Qrs" (n = 4, 20.0%). The RBBB-like pattern was found to be significantly more prevalent among patients with bradycardia (n = 33, 71.3%) in comparison to those with indications for CRT (n = 2, 22.2%, p = 0.005). Conversely, other morphologies were notably more common in the CRT group (n = 7, 77.8%) than in the ECGs of patients with bradycardia indications (n = 13, 28.3%, p = 0.005). Further assessment revealed that other QRS morphologies in bradycardia ECGs were caused by deep septal pacing rather than LBBAP (n = 7, 53.8%) and anodal capture in LBBAP (n = 6, 46.2%). The fusion of LBBAP with intrinsic rhythm was the most common cause of other morphologies in CRT ECGs (n = 4, 57.1%), while there was one case each (14.3%) of anodal capture in LBBAP, a faster intrinsic rhythm, and non-selective LBB pacing.

Conclusion: LBBAP pacing in bradycardia indications is associated with an RBBB-like pattern in ECG lead V1, particularly the „Qr" type. In CRT, LBBAP is associated with different QRS morphologies. The absence of an RBBB-like pattern may not indicate loss of LBBAP capture.

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LITERATURE

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