CASE REPORT

Total Masquerading Bundle Branch Block

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We report a case of 82-year-old female with total masquerading bundle branch block. We discuss the problems with ECG analysis.

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CASE REPORT

We report a case of 82-year-old female with permanent atrial tachycardia, severe left ventricular dysfunction (EF%—25%), hypokiesia of intraventricular septum, and chronic heart failure. In addition, she had large achalasia of the esophagus.

ECG shows atrial tachycardia with PP interval (260–280 ms) and variable conduction block 2:1 to 3:1. QRS axis: -61° . Two morphologies of QRS are seen: (1) with a narrow QRS—90–100 milliseconds and (2) with a wide QRS—140–148 milliseconds (Fig. 1).

A narrow and a wide QRS complex presents left anterior fascicular block (LAFB) of left bundle branch block (Fig. 1). LAFB diagnosis is based on: (1) QRS axis $> -45^\circ$; (2) q wave (qR pattern) in lead aVL, rS pattern in leads II, III, aVF; (3) R peak time in lead aVL > 45 milliseconds; (4) QRS width < 120 milliseconds (for a narrow QRS complex, but QRS ≥ 120 milliseconds in the presence of RBBB does not exclude LAFB). All above-mentioned criteria of LAFB were fulfilled in our case.

In precordial leads, in beats with a narrow QRS complex, no septal q wave is present in V_5 – V_6 leads, small q wave is present in leads V_3 – V_4 with a prominent R wave in V_3 – V_4 leads. Negative T waves are seen in leads V_3 – V_6 with prolonged QT interval 500 milliseconds (Fig. 1).

In turn, in beats with a wide QRS complex, is seen deep and wide S wave pattern in leads V_2 – V_6 . In leads V_5 – V_6 , the S-wave pattern is identical as in typical right bundle branch block (RBBB). T wave gets flat and QT interval shortens to 420 milliseconds. There is a rS pattern in lead V_1 without morphological characteristics of the RBBB. Moreover, in limb leads, especially in leads I, S wave is absent (Fig. 1).

The picture of wide QRS complexes in leads V_5 and V_6 strongly suggests the presence of RBBB. The QRS pattern in lead V_1 contradicts the diagnosis. In our case, the higher right precordial leads ($V_1 + H$, $V_2 + H$) recorded one intercostal space above the standard place confirm the presence and diagnosis of RBBB (Fig. 2).

DISCUSSION

Present case presents extremely rare ECG picture when advanced LAFB total masquerading RBBB. Most of cases with RBBB-associated LAFB present QRS axis in limb leads between -80° to -120° .¹ When LAFB is more advanced the QRS axis in limb leads is about -60° , the ECG becomes atypical. It can lead to very small or even absent of S wave in lead I. In this scenario, ECG masquerading RBBB and it imitates left bundle branch block (LBBB) in limb leads and ECG is

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Figure 1. ECG with a paper speed 50 mm/s, showing narrow and wide QRS complexes. Black asterix indicates a wide QRS complex. ECG described in details in the text.

often interpreted as LBBB. When RBBB with LAFB resembles LBBB in the limb leads it is called "the standard masquerading," if it happens in the precordial leads it is called "the precordial masquerading."¹ In the first cases, the S wave is absent in lead I; in the latter one, the S wave is absent in leads V₅ and V₆. In both, RBBB is diagnosed by typical QRS pattern in lead V₁.

In our case, the initial r wave (in leads II, III, and aVF) voltage increases relative in the wider QRS complex in comparing to the narrower QRS complex (Fig. 1). In addition, delays are located in the left anterior superior wall with considerable increase in S waves in lead III. Following Mauricio Rosenbaum nomenclature, this is a type IV LAFB ("type IV left anterior hemiblock" presents association of LAFB and left ventricular hypertrophy), alternating with lower grade of LAFB.²

The wide QRS complex is irregular for which possibly is conducted and adds a phase 3

dromotropic disturbance. Both QRS complexes have Q wave in lead I, therefore does not exist on V₆, is possibly of being positional.

Finally, the patient has severe achalasia therefore very likely to be the carrier of mega esophagus, which can change significantly altering cardiac position vector analysis by extrinsic factors to heart.

In presented ECG, the QRS axis in limb leads is close to -60° what leads to atypical ECG pattern and masquerading RBBB in the presence of LAFB. In our case, the S wave is present in leads V₅, V₆, and absent in lead I, but typical for RBBB QRS pattern is absent in lead V₁. Only the high right precordial leads confirm the presence RBBB and the proper diagnosis.

We advise to carefully analyze the ECG to look for typical features of RBBB in the presence of LAFB, especially when QRS axis remains close to -60° and QRS width is above 140 milliseconds, even if there is no typical QRS pattern for RBBB

Figure 2. ECG with a paper speed 25 mm/s. The modified right precordial higher leads (H), V₁ + H, and V₂ + H (recorded one intercostal space above the standard position).

in lead V₁. In a case like this, the higher right precordial leads can play the key role in proper diagnosis and uncover the presence of RBBB.^{3,4}

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