

LEFT BUNDLE BRANCH BLOCK AND RIGHT AXIS DEVIATION DUE TO SEVERE CORONARY HEART DISEASE

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ABSTRACT

The simultaneous occurrence of left bundle branch block and right axis deviation is very rare and occurs mainly in patients with cardiomyopathy. This paper describes a 61-year-old man with end stage ischaemic heart disease who presented with this unique electrocardiographic abnormality.

Keywords : Bundle branch block, Coronary disease

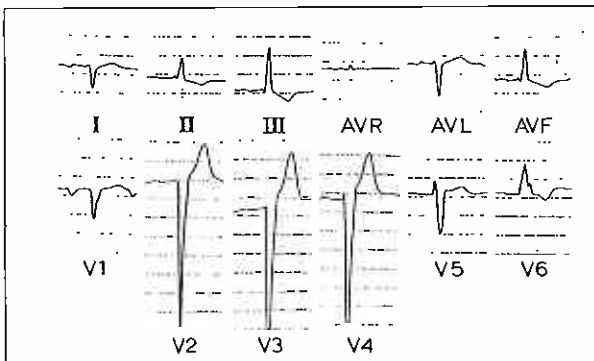
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CASE REPORT

A 61-year-old Chinese man was admitted to the coronary care unit for severe, intractable angina occurring at rest. Seven years previously, he had suffered an uncomplicated acute myocardial infarction. However, the records of this hospitalization are unavailable. Clinical examination on admission revealed an apical holosystolic murmur and signs of congestive cardiac failure. The 12-lead ECG showed evidence of an old anterior Q wave myocardial infarction but no bundle branch block. Serial cardiac enzymes which were done were within the normal limits. Despite repeated intravenous injections of morphine and oral isosorbide dinitrate, the patient still complained of severe continuous chest pain. Coronary angiography which was then performed showed: (1) 75% stenosis of the left main coronary artery (2) total occlusion of the left anterior descending artery, circumflex artery and the mid right coronary artery (3) 60% stenosis of the diagonal artery. Left ventricular angiography in the right anterior oblique position showed very severe mitral regurgitation and akinesia of the anterolateral wall and apex.

The patient underwent coronary artery bypass surgery where saphenous veins were grafted to his left anterior descending artery, diagonal artery, posterior descending artery and the posterolateral branch of the circumflex artery. In addition, both the anterior as well as the posterior mitral valve leaflets were noted to be flail due to chordal rupture. The mitral valve was excised and replaced with a Hancock bioprosthetic tissue valve. The patient had an extremely stormy post-operative course but was discharged from the hospital in a satisfactory condition about 6 weeks later. In the follow-up, he was found to be in persistent heart failure and was treated with oral frusemide and digoxin. Soon after the patient's discharge from the hospital, it was noted that all his subsequent 12-lead ECGs showed complete left bundle branch block and right axis deviation. He died from severe heart failure 9 years after his operation. Fig 1 shows the 12-lead ECG which was recorded 2 years before the patient's death.

Fig 1 - ECG shows complete left bundle branch block as evidenced by a widened QRS complex (0.16 sec) with a RSr pattern in lead V6. There is coexisting right axis (approximately +140°). The PR interval is prolonged (0.24 sec) and this is most likely due to the digoxin which the patient was taking.



DISCUSSION

The combination of left bundle branch block and right axis deviation is rarely reported in the literature. In 1985, Nikolic and Marriott could collect only 53 cases which had been previously documented and added 3 cases of their own thus giving a total of 56 cases⁽¹⁾. Approximately half of these cases had been reported in the English literature and the rest in the European literature.

The exact aetiology of this ECG pattern is at present largely unknown. Many of the cases which had been reported so far were not adequately investigated and only 19 cases had autopsies performed. Out of the total series of 56 cases reviewed by Nikolic and Marriott, 21 patients were described as having cardiomyopathy (primary congestive cardiomyopathy accounted for 18 patients), 12 patients had hypertension and a miscellaneous group of 10 patients presented with either congenital or valvular heart disease, cardiac surgery, myocarditis or traumatic systemic AV fistula. Although arteriosclerotic heart disease was listed in 9 cases, the coronary status was not described in any of these patients. An additional 3 patients were also listed as having presumptive coronary artery disease without any confirmatory evidence.

Based on their 3 carefully studied cases (all of whom had congestive cardiomyopathy) and an exhaustive review of the literature, Nikolic and Marriott concluded that: (i) the most frequent aetiology of left bundle branch block and right axis deviation was idiopathic congestive cardiomyopathy, (ii) this unique ECG abnormality was an insensitive but very specific

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marker for diffuse myocardial disease, especially idiopathic congestive cardiomyopathy. They also commented in their review that this ECG pattern was not encountered in infarction of the free wall of the left ventricle. Therefore, it is of considerable interest that in the patient described in this paper, the initial presentation was acute myocardial infarction. Subsequently, severe coronary artery disease and a severely dam-

aged left ventricle were both confirmed by coronary angiography, left ventriculography and at cardiac surgery.

REFERENCES

1. Nikolic G, Marriott HJL. Left bundle branch block with right axis deviation: a marker of congestive cardiomyopathy. *J Electrocardiol* 1985;18(4): 395-404.

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