Bilateral Bundle Branch Block in an Asymptomatic Patient

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SUMMARY

A 74-year-old male is described who demonstrated an intermittent appearance of a right and left bundle branch block with varying P-R intervals. The best explanation of these electrocardiograms is that a bilateral bundle branch block is present. In spite of this conduction defect, the patient remains asymptomatic and has never developed complete heart block.

Additional Indexing Words:
Complete heart block  Cardiac pacemaker  Conduction defect

It is now recognized that complete heart block can occur as a consequence of bilateral bundle branch block.1) Since pacemaker therapy is now available for patients in complete heart block, early recognition of bilateral bundle branch block is of great clinical importance. However, the diagnosis of bilateral bundle branch block can be made with certainty only if a right bundle branch block and left bundle branch block can be demonstrated electrocardiographically at different times in the same patient.2) This is a very uncommon occurrence; Lepeschkin described only 9 cases in his extensive review of the subject.3) The purpose of this article is to document this unusual occurrence in an asymptomatic patient.

CASE REPORT

A 74-year-old white male was admitted to the Bronx Veterans Administration Hospital on October 3, 1968, because of the urinary symptoms of hesitancy and nocturia. The patient had been in excellent health prior to admission, and never had any symptoms referable to the cardiovascular system. The physical examination revealed a blood pressure of 160/100 mm. Hg and a pulse rate of 98/min. and regular. The neck veins were not distended. The lungs were clear to percussion
and auscultation. There was no enlargement of the heart. No murmurs or gallop sounds were audible. The liver and spleen were not palpable. The prostate was enlarged. The complete blood count, urinalysis, blood urea nitrogen, sodium, potassium, chloride, CO₂ combining power and serology, were within normal limits. The admission chest X-ray showed no abnormalities. The initial electrocardiogram

Fig. 1.

Fig. 2.
Fig. 3.

on 8/28/68 revealed a sinus rhythm and a right bundle branch block with first degree heart block. The P-R interval was 0.24 sec. (Fig. 1). A repeat electrocardiogram on 9/18/68 now showed a left bundle branch block with a P-R interval of 0.36 sec. (Fig. 2). An additional electrocardiogram on 10/18/68 again revealed a right bundle branch block with a P-R interval of 0.24 sec. (Fig. 3).

Discussion

The diagnosis of bilateral bundle branch block can be made with certainty only if there is an alternation or intermittent appearance of right and left bundle branch block patterns, and one of these consistently shows a longer P-R interval than the other. According to Rosenbaum and Lepeschkin, this pattern indicates only partial interruption of both bundle branches, with more severe block in one branch than in the other at one time, and less block at another time. The best explanation of our patient's electrocardiograms is that a bilateral conduction disturbance is present. An analysis of these electrocardiograms reveals that the conduction time is about 0.14 sec. in the A-V node, about 0.10 sec. in the left bundle branch when the rate is not too fast, and about 0.22 sec. in the right bundle branch. At slower heart rates the left bundle delay is responsible for the moderate prolongation of the P-R interval, while the right bundle delay is responsible for the right ventricle, being activated entirely from the left side. At fast heart rates complete interruption of conduction in the left bundle branch appears, and the delay through the right branch now causes considerable prolongation of the P-R interval.

The underlying lesion in the great majority of patients with bilateral bundle branch block is degenerative fibrosis of both bundle branches, or less
often the bifurcation. These degenerative changes are believed to be due to the cumulative effects of mechanical wear and tear on these structures, for the changes increase with age and occur earlier and more severely in the presence of hypertension. They do not appear to be related to ischemia. A slow development of bilateral bundle branch block is the rule when degenerative fibrosis is the primary lesion. However, bilateral bundle branch block can develop rapidly when it is the result of a myocardial infarction. This is more commonly seen in an anterior than in a diaphragmatic wall myocardial infarction.

In our patient, degenerative fibrosis was the most probable cardiac lesion. Coronary artery disease was of little consequence in view of the lack of historical, laboratory or electrocardiographic evidence to support this diagnosis.

It is of interest that in a 6 month follow-up period, the patient has still not developed complete heart block. If this complication occurs, insertion of a pacemaker may then be required. However, only careful observation would seem to be necessary in the asymptomatic patient with bilateral bundle branch block.

REFERENCES

3. Lepeschkin, E.: Personal communication.