CASE REPORTS

A CASE OF VENTRICULAR FIBRILLATION

BY

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A case of complete heart block with paroxysms of ventricular fibrillation, during the last night of her life is reported.

Case Report

A woman, aged 85, was admitted to Harrogate General Hospital under the care of Mr. Gordon Bailey on May 30, 1950 with vomiting and constipation that had been present for four days. Heart block had been diagnosed by her family doctor three weeks before.

Her pulse was irregular, 32 a minute; the blood pressure was 230/90. She vomited repeatedly and gastric suction and intravenous saline were started to combat dehydration.

On June 2 her vomiting had ceased; she was seen by Dr. Curtis Bain and a diagnosis of complete heart block with premature ventricular beats was made. The heart was not enlarged, but persistent crepitations were audible at the base of the left lung.

On June 4 the patient developed attacks of unconsciousness lasting a few seconds, in which she became pulseless and cyanosed, with tonic and clonic movements of the limbs. The attacks became more frequent and she died on June 9.

A cardiogram taken on June 6 showed complete heart block with an auricular rate of 100 and the Q-T time greatly prolonged, 0.72 sec. (Fig. 1). The ventricular rhythm was irregular due to multifocal ectopic beats, the rate being about 36. A short paroxysm of ventricular tachycardia is shown, preceded by an initial premature beat. The latter follows the preceding ventricular complex by an interval of 0.68 sec. and is directed downwards (Fig. 2).

FIG. 1.—Complete heart block. Q-T time 0.72 sec., auricular rate 100.

FIG. 2.—Multifocal ectopic beats. Initial premature beat (I) follows preceding beat after 0.68 sec. Ventricular tachycardia.

The final set of cardiograms was taken on the night of June 8 between 8 p.m. and 11 p.m. The patient died at 12.15 a.m. on June 9.

Several short paroxysms of ventricular tachycardia and ventricular fibrillation occurred and the auricular rate increased to 120 a minute (Fig. 3).

FIG. 3.—Multifocal ectopic ventricular beats. Auricular rate 120.

Short paroxysms of ventricular tachycardia occurred without ensuing fibrillation (Fig. 4); and they usually ended in a short pause during which one or two auricular beats occurred before the idioventricular rhythm was resumed.

FIG. 4.—Paroxysm of ventricular tachycardia.

Fig. 5 shows the end of a paroxysm of ventricular tachycardia: a short pause is followed by multifocal ectopic ventricular beats, and these are followed by a short period of ventricular fibrillation (Fig. 6).

FIG. 5.—End of paroxysm of ventricular tachycardia followed by multifocal ectopic beats.

FIG. 6.—Short bout of ventricular fibrillation (initial fibrillary period) ending in ectopic ventricular beats.

Fig. 7 shows the end of a bout of ventricular tachycardia leading into what looks like ventricular flutter at a rate of 300. This is followed by ventricular fibrillation; the waves become irregular in size and duration and the ventricular rate has increased once more (Fig. 8).

FIG. 7.—Ventricular tachycardia leading into ventricular flutter (Rate 300).

FIG. 8.—Ventricular fibrillation (Rate about 400).

Following the paroxysm of ventricular fibrillation there was an undulatory pause of about five seconds, a solitary ventricular complex occurring at the end of the pause (Fig. 9). During this pause

FIG. 9.—Post-undulatory pause of 5 seconds. Auricular rhythm irregular. Solitary ventricular complex at the end of the pause.

the auricles beat irregularly. Finally an idioventricular rhythm is resumed (Fig. 10). Terminal cardiograms of this case were not, unfortunately, obtained.

FIG. 10.—Complete heart block resumed after paroxysm of ventricular fibrillation.

Discussion

Ventricular fibrillation is well known as an agonal phenomenon. The fact that it occurs in episodes followed by recovery is not so well recognized.

Robinson and Bredeck published the first case of ventricular fibrillation with recovery in 1917. Schwartz (1942) described as many as three hundred attacks occurring in the same patient in twenty-four hours. His paper illustrates three phases in the development of ventricular fibrillation.

(1) *Prefibrillary stage.* The development of ventricular fibrillation depends on an increase in the basic ventricular rate; and this can occur in several ways, as shown in the electrocardiograms of the present case. Ventricular tachycardia followed by multifocal ectopic beats leads into ventricular fibrillation (Fig. 5 and 6). Schwartz (1942) calls the ectopic beat that initiates the run of tachycardia preceding fibrillation, the initial premature beat (Fig. 2). This bears a constant time relationship to the preceding ventricular complex, and all such initial beats are similar in form and direction. The occurrence of such beats supports the view that an irritable focus in the ventricular muscle is a precursor of ventricular fibrillation. A prolonged attack of ventricular fibrillation is preceded by shorter periods, called initial fibrillary periods (Schwartz, 1942); these are apparently peculiar to the human heart (Fig. 6).

(2) *Fibrillary stage.* The curve is quite characteristic, the complexes are deformed and variable in size resembling an artefact rather than an electrocardiogram. They may, however, be preceded by ventricular oscillations varying in height from 8–10 mm. at a rate of 280 to 300 a minute (Fig. 7). Schwartz calls this ventricular flutter, but other authors do not consider this term justifiable (Parkinson *et al.*, 1941).

(3) *A post-undulatory pause* always follows a bout of fibrillation, the longest recorded being 79 seconds (Parsonnet *et al.*, 1946). When the preceding fibrillary period is long the auricles may stop beating, or beat irregularly during the pause (Fig. 9). Some hours later auricular fibrillation or flutter may appear.

Summary

A case is presented of complete heart block with paroxysms of ventricular fibrillation.

I wish to thank Dr. Curtis Bain and Mr. Gordon Bailey for permission to publish this case.

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