Chest thump is a simple and useful method of treatment for ventricular tachycardia. We present the electrocardiographic tracings observed in two patients where thumping the chest induced a change in the ventricular tachycardia QRS morphology without altering the rate of the ventricular tachycardia (pleomorphism).

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CASE REPORTS

CASE 1

Figure 1 represents the electrocardiographic tracings obtained from a 59-year-old man admitted with an acute anterior wall myocardial infarction. Several hours following admission, ventricular tachycardia at a rate of 125 beats/min appeared (Fig 1, top strip). This tachycardia was easily terminated by a chest thump. Five minutes later, ventricular tachycardia with identical morphology but faster rate (150 beats/min) appeared (Fig 1, middle strips). Chest thump induced a premature ventricular complex (arrow) without terminating the ventricular tachycardia, but changed the QRS morphology from right axis to left axis deviation. With this new QRS morphology, the ventricular tachycardia rate...
decreased by 10 beats/min. A repeat chest thump reverted this second QRS morphology of the ventricular tachycardia to sinus rhythm (Fig 1, lower strip). No further episodes of ventricular tachycardia were observed and the patient made an uneventful recovery.

CASE 2

Figure 2 represents the electrocardiographic tracing observed in a 62-year-old man admitted in cardiogenic shock secondary to an extensive anterior wall myocardial infarction. Eight hours after admission, ventricular tachycardia at a rate of 190 beats/min appeared. A chest thump (arrow) was immediately applied. Following the thump the ventricular tachycardia continued at the same rate, but a change in the morphology of the QRS from right axis to left axis deviation was observed. The patient was immediately cardioverted to sinus rhythm. The patient died in cardiogenic shock despite intensive medical therapy.

COMMENTS

Pleomorphism of QRS morphology during ventricular tachycardia has been described recently as a common finding in patients with recurrent sustained ventricular tachycardia. Josephson et al. in a study of 26 patients with recurrent sustained ventricular tachycardia, were able to induce (during electrophysiologic studies) in 14 of these patients two or more morphologically distinct tachycardias characterized by a greater than 90° shift in frontal plane axis and/or a change of bundle branch block pattern. Eleven of these 14 patients had ischemic heart disease with ventricular aneurysms. This represented a frequent association of pleomorphic ventricular tachycardia with left ventricular aneurysms. Of the total group of 26 patients, 11 of 13 patients with left ventricular aneurysm, but only three of 13 patients without aneurysm, developed ventricular pleomorphism during electrophysiologic study. Moreover, nine of the 14 patients had pleomorphic ventricular tachycardia clinically. The authors concluded that pleomorphism usually represents variable exit sites or ventricular activation during the same tachycardia.

Kaplinsky et al., using an experimental canine model with induced acute myocardial ischemia, demonstrated that the observed pleomorphism of ventricular ectopic beats or ventricular tachycardia was related to different efferent pathways of activations arising from the same location.

Pleomorphism of a ventricular tachycardia has been observed spontaneously, during electrophysiologic studies, and also as a result of low energy (10 watt-seconds) synchronized electrical cardioversion. Chest thump usually terminates ventricular tachycardia by induction of a premature ventricular beat. This is similar to electrical stimulation of the heart where single ventricular extrastimuli may terminate a ventricular tachycardia (implying a reentry mechanism). To the best of our knowledge, chest thump has not been reported to induce ventricular tachycardia pleomorphism. The change in QRS morphology observed in our two patients following a chest thump implies a penetration and block of the efferent pathway of the ventricular tachycardia with subsequent change to a different efferent pathway without altering the original reentry circuit responsible for the ventricular tachycardia.

Low energy delivers to the heart during ventricular tachycardia as observed during ventricular programmed stimulation, electrical cardioversion or chest thump are able partially to penetrate and modify the ventricular tachycardia efferent pathways resulting in new QRS morphologies and creating the phenomenon of pleomorphism.

REFERENCES

3 Kaplinsky E, Ogawa S, Kmetzo J, Dreifus LS. Origin of so-called right and left ventricular arrhythmias in acute myocardial ischemia. Am J Cardiol 1978; 42:774-80