PARADOX OF CARDIAC ARRHYTHMIA IN ANAESTHESIA

A Case Report

BY

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SUMMARY

A case report is presented about an African patient with pre-operative multiple ventricular extrasystoles that reverted to sinus rhythm on being subjected to general anaesthesia. This occurrence is paradoxical to the more common incidence of cardiac arrhythmia developing during anaesthesia and necessitating the use of beta-adrenergic blocking drugs for its suppression. A discussion follows about the possible cause of this particular ventricular arrhythmia and the simple anaesthetic technique that managed to suppress it completely.

It is more common for a patient with regular heart beats to develop cardiac arrhythmia during general anaesthesia than, conversely, for a patient with cardiac arrhythmia of some duration to revert to sinus rhythm on being subjected to general anaesthesia. While the former occurrence is generally expected, the latter would be deemed paradoxical.

The case described below concerns a woman who, before operation, had gross cardiac irregularities which reverted to sinus rhythm on induction of general anaesthesia; moreover the sinus rhythm persisted during the operation and continued throughout the whole postoperative period.

CASE REPORT

The patient, an African woman aged 59, was admitted to Harari Central Hospital, Salisbury, on October 3, 1966, suffering from a swelling of one year's duration (semimembranosus bursa) behind the right knee. The presence of pain, especially during walking, compelled her to seek treatment at the hospital.

On examination, the patient was found to be of average build, elderly but looking well. Nothing abnormal was detected in any of her body systems apart from the cardiovascular. Although she had a left ventricular heave, her heart was not enlarged as confirmed by the chest X-rays. The apex beat and the radial pulse were grossly irregular due to the presence of multiple extrasystoles. An aneurysm of the right common carotid artery was also detected. She had no chest pain nor ankle oedema. The radial pulse was about 84 beats/min, the blood pressure 150/90 mm Hg and the haemoglobin content was 76 per cent (11.0 g/100 ml). The Wassermann reaction was negative. The body temperature was normal. No treatment to correct the patient's cardiac arrhythmia was instituted in the ward.

Two days after her admission to hospital, the patient was brought to the operating theatre for surgical excision of the semimembranosus bursa. As premedication she was given pethidine 50 mg and atropine 0.6 mg subcutaneously an hour previously. Before the induction of anaesthesia the patient appeared calm but her pulse was still grossly irregular due to the inclusion of premature beats as shown in the electrocardiographic records (fig. 1). Despite some variation in the configuration of the ventricular complex of the premature beats, the coupling interval seemed to be constant; this would suggest unifocal rather than multifocal ventricular extrasystoles. The blood pressure was 160/95 mm Hg and the pulse averaged 90 beats/min.

After preoxygenation for 3 minutes, anaesthesia was induced with thiopentone sodium 300 mg in 2½ per cent solution injected fractionally. An oro-pharyngeal airway and a facepiece were applied, and anaesthesia was maintained with nitrous oxide and oxygen (5/2.5 l./min) and 1.0 per cent halothane using the semi-open tech-
nique (Magill attachment on a Boyle machine): this mixture maintained the patient in a light surgical plane of anaesthesia, allowing her to breathe spontaneously and regularly throughout the operation.

Soon after the injection of the last drops of thiopentone sodium, there was a dramatic reversal of the ventricular arrhythmia to sinus rhythm (fig. 2); also the blood pressure dropped to 140/85 mm Hg and the pulse to 76 beats/min. This state persisted throughout the whole operation of about 30 minutes duration, despite the fact that a tourniquet was applied above the knee and that the patient herself was put in a semiprone position on the operating table, care having been taken to avoid any respiratory obstruction.

The patient regained consciousness 7 minutes after the termination of surgery. As postoperative sedation a single dose of papaveretum 20 mg was injected intramuscularly soon after arrival in the ward 10 minutes later.

Throughout the postoperative period the patient felt well and contented, the body temperature remained normal and the wound healed satisfactorily. She was discharged from hospital on October 13, 1966 (8 days after the operation) still maintaining sinus rhythm of 76 beats/min.

DISCUSSION

In this case there is an uncertainty regarding the actual duration and aetiology of the cardiac arrhythmia. If the primary cause of the latter was the presence of the aneurysm of the right common carotid artery, then it could be inferred that the heart irregularities were of a relatively long standing; from the history, however, one gleans that the aneurysm had not really bothered or incapacitated her in any way.

It is more likely that the heart irregularities were of recent onset, originating at the time the patient's semiprone position on the table. The operation was a minor and a short one; the patient settled down comfortably to the mask and oropharyngeal airway, so it was not feasible to chance the risks involved in adding a relaxant for intubation, in deepening the anaesthesia for tolerance of the tube and in a possible hypoxic episode on extubation (Smeeton, 1966).

Halothane was chosen as the adjuvant to maintain anaesthesia because of its known beneficial properties. Halothane is non-flammable, less prone to irritate the larynx and to provoke spasm of the glottis than other available adjuvants like ether and cyclopropane; moreover, with the aid of the Fluotec vaporizer, accurately controlled concentrations can be delivered. In low concentrations halothane is potent enough, especially if combined with nitrous oxide, to maintain adequate anaesthesia protecting the patient from the adverse effects of the surgical trauma. Halothane evokes a metabolic depression (Etsten and Shimosato, 1966) and suppresses the activity of the sympathetic nervous system (Li, Laasberg and Etsten, 1964). Even with the development of hypercarbia the sympatho-adrenal response is less during halothane anaesthesia than with cyclopropane or ether (Dripps, Eckenhoff and Vandam, 1963). Halothane has been recently
tried in a few cases of phaeochromocytoma resection with apparently good results (De Blasi, 1966). Lastly my apprehension, regarding a possible hypersensitivity of this patient for halothane, was dispelled by my previous experience that this sensitivity is rare among the local African population, due more to their particular constitution rather than to the high altitude locally (4831 feet above sea level).

The ventricular arrhythmia, which was present for some time before operation in this case, was immediately suppressed by anaesthesia: such an occurrence is not what is usually anticipated. This may be because the anaesthetist is reluctant to attempt general anaesthesia on such a patient or if he does, the cardiac irregularity may linger throughout the operation, or worse still, may change into ventricular flutter or fibrillation.

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REFERENCES