APPLIANCE

PULSE MONITOR IN OCULAR SURGERY*

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REED AND McCAUGHEY (1962) have recently drawn attention to the bradycardia which often follows traction on the external ocular muscles during strabismus surgery. This slowing of the heart rate which may be very marked is transient and therefore not usually noticed by the surgeon or anaesthetist unless instrumental aid is employed. Very occasionally, in susceptible individuals, a short period of total cardiac arrest may occur, though the writers have not experienced this phenomenon, and this is a well-known, though fortunately rare, cause of total cardiac arrest with failure of the circulation. It appears likely that the effect is a reflex one and similar to the oculo-cardiac reflex, whereby pressure on the globe produces slowing of the heart beat by 5 to 13 beats per minute in normal individuals. In some the slowing is greatly exaggerated and the heart rate may fall by up to 50 beats per minute. Abdominal visceral stimulation has similar effects which are usually accompanied by hypotension and arrhythmia. Traction on the external ocular muscles usually produces simple bradycardia probably by vagus depression of the pacemaker. Many general anaesthetics such as fluothane have a similar action which may be reinforced by the traction reflex, and the condition is potentially dangerous though treatment by atropine is simple and effective.

For this reason the writers have for several years used a simple pulse monitor (Keating, 1952) routinely during ocular surgery. The instrument has also been found to be of value during the operation of myectomy of the inferior oblique when carried out through the lower eyelid; after incision a squint hook is introduced on the flat along the floor of the orbit for about three-quarters of an inch when the point is rotated upwards and the instrument gently withdrawn. It is at this stage that the pulse monitor is of considerable assistance because a slowing of the oscillations will indicate that, in addition to the fat which is often the only structure visible, the hook has engaged a muscle. Very gentle traction insufficient to cause movement of the globe can clearly be seen to slow the pulse if the muscle is engaged, but this does not occur if fat alone is drawn forward. The classical description

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of the operation assumes that the globe moves upwards and outwards when the muscle is caught in the squint hook, but this is by no means an invariable finding, and the response of the pulse monitor is a useful confirmation.

FIGURE.—Instrument with attachment to the finger.

The instrument illustrated here is attached to the pulp of the patient's finger or toe, and after being switched on requires no further attention. As it is actuated by the pulsation of the finger it gives a rough indication of the functional behaviour of the circulation throughout the operation, and of course gives warning of cardiac arrhythmias due to causes other than ocular muscle traction. The power supply is from a laryngoscope or torch battery renewed every 4 or 5 months and the monitor can be used in the presence of explosive gases.

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REFERENCES

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