

LETTERS TO THE JOURNAL

Sir,

Persistent Tachycardia Following Subconjunctival Injections of Mydriatic Agents (Mydracaine) Used for Maintenance of Perioperative Mydriasis in Vitreoretinal Surgery

The adverse effects of mydriatic agents are well documented. These include severe hypertension, subarachnoid haemorrhage, ventricular arrhythmias, and myocardial infarction.¹ Subconjunctival injections of mydriatic agents are recommended by some authorities to dilate pupils in uveitic patients with posterior synechiae.² These agents are also used to achieve and maintain mydriasis perioperatively during prolonged vitreoretinal procedures. These injections can lead to significant systemic absorption and serious complications,³ the risk being enhanced by conjunctival hyperaemia.

Following induction of anaesthesia patients undergoing complicated vitreoretinal procedures at Newcastle General Hospital routinely receive a subconjunctival injection of a mixture comprising 1

mg atropine, 0.12 mg adrenaline and 6 mg procaine (Mydracaine No. 2, formulated by Moorfields Eye Hospital). We report three instances in previously healthy individuals of prolonged supraventricular tachycardia induced by the subconjunctival injection of these mydriatic agents.

Case Reports

All three patients had surgery under general anaesthesia, which was performed by the same senior anaesthetist. The induction agents used for anaesthesia were identical, i.e. fentanyl and propofol. Anaesthesia was maintained in each patient by a mixture of 70% nitrous oxide, 29% oxygen and 1% isoflurane. Ventilation was maintained with intermittent positive pressure via a laryngeal mask. No anticholinergic drugs were used by the anaesthetist.

Each patient was previously healthy, with no history of cardiovascular disease, and was undergoing complex retinal surgery. Two of the patients had suffered recent ocular trauma. Patient 1 was

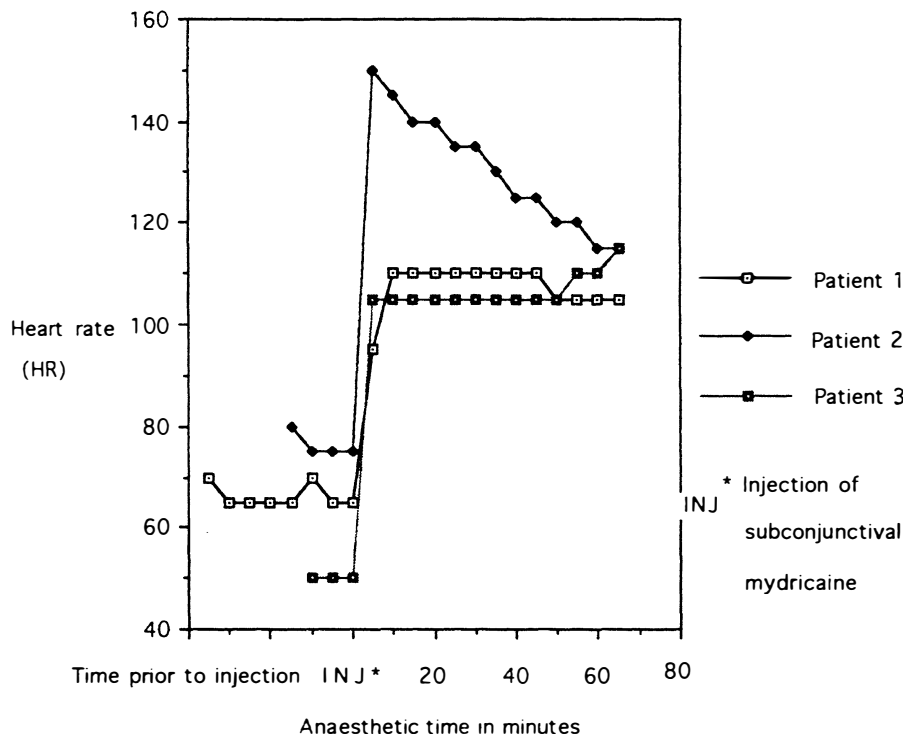


Fig. 1. Heart rate recordings from three patients undergoing vitreoretinal surgery under general anaesthesia following subconjunctival injections of mydriatic agents (Mydracaine).

aged 41 years; patients 2 and 3 were both aged 14 years.

Within 5 minutes of injection of Mydracaine subconjunctivally, the pulse rate of each patient rose dramatically (Fig. 1). In addition, in two of the patients a rise in blood pressure was noted also within 5 minutes. In patient 1 it rose from 150/70 to 195/95 mmHg; this steadily decreased over 30 minutes. In patient 2 the blood pressure rose from 100/50 to 145/75 mmHg; this steadily decreased over 15 minutes. All other parameters monitored remained unchanged. All patients made uneventful recoveries.

Discussion

Disturbances of the cardiac rhythm during ophthalmic surgery are observed in all patients of all ages.⁴ Extrasystoles and sustained cardiac arrhythmias are particularly common in older patients.⁴ Atropine when given intravenously appears to have a protective effect on the oculo-cardiac reflex.⁴

Atropine is an anticholinergic drug. Systemic absorption of subconjunctival atropine can result in adverse side-effects.^{3,5} Cardiac dysrhythmias are one of the major adverse reactions. Atrial fibrillation and supraventricular tachycardia can be precipitated by the drug.⁵ Cardiac effects of atropine should be considered carefully before administration of the drug via the subconjunctival route in patients with cardiac dysrhythmias.

Adrenaline is a potent, direct-acting alpha 1 agonist. Stimulation of these receptors can cause constriction of the systemic, pulmonary and coronary arteries, leading to severe hypertension, arrhythmias and myocardial infarction.³ Procaine produces a tachycardia but its effect is significantly less than that produced by cocaine.⁶

It is conceivable that in our patients atropine, adrenaline and procaine caused the prolonged tachycardia by an additive effect and that in two of the patients their systemic absorption was enhanced by conjunctival hyperaemia secondary to the recent trauma.

Potent mydriatic agents such as Mydracaine are used to dilate pupils in hyperaemic uveitic eyes with posterior synechiae at outpatient clinics. We advise extreme caution when using these agents via the subconjunctival route in patients with previous cardiovascular disease and, in particular, a history of dysrhythmias. Careful patient selection should minimise severe cardiac complications.

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Sir,

Lattice Dystrophy and Corneal Ulceration

Lattice dystrophy is an autosomal dominant disorder, usually presenting in the first decade of life with symptoms of recurrent erosion or visual disturbance.¹ It is often thought to be a relatively benign disease, requiring penetrating keratoplasty for visual disturbance only, but in our experience it can become complicated by serious secondary anterior segment disease.

We present two patients with lattice dystrophy associated with corneal ulceration and abscess formation.

Case Reports

Case 1. A 45-year-old man with lattice dystrophy presented with a 2 day history of pain and decreased vision in his left eye. He had suffered four similar episodes in the preceding year. A diagnosis of corneal ulceration with an abscess and hypopyon was made. Microbial investigations did not yield any pathogenic organisms. The patient responded to intensive topical chloramphenicol and gentamicin, with resolution of the ulcer.

The same man presented 3 years later, with a 5 day history of a painful, red left eye and severe visual loss. A corneal abscess with hypopyon was found to be the cause. *Pseudomonas* sp. and *Moraxella* sp. were isolated and responded to topical cefuroxime and gentamicin. The corneal abscess resolved, but an epithelial defect remained and later required a penetrating keratoplasty.

Case 2. A 71-year-old man with lattice dystrophy and a painful, red right eye of 2 days' duration was found