Oculocardiac Reflex Elicited During Debridement of an Empty Orbit

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ABSTRACT

The oculocardiac reflex (OCR) is a well-described cardiac depressor reflex that may result in significant cardiac rate or rhythm changes including sinus and junctional bradycardia, heart block or asystole. Therefore, OCR can have profound hemodynamic consequences resulting in morbidity or mortality.\textsuperscript{4,11} The OCR is classically depicted as being precipitated by traction on the extracranial muscles or pressure on the globe. The stretch receptors in these structures are innervated by the ciliary nerves that form the ciliary ganglion, which in turn contributes to the ophthalmic branch of the trigeminal nerve. These afferent pathways converge in the sensory nucleus of the trigeminal nerve. The efferent pathway of the OCR is mediated by the motor nucleus of the trigeminal nerve resulting in the negative chronotropic and dysrhythmic effects on the heart (figure 2).\textsuperscript{6}

A similar reflex has been reported without the prerequisite manipulation of areas innervated by the ophthalmic branch of the trigeminal nerve. Reflex bradycardia may be seen during maxillary ostectomy or maxillary advancement during Le Fort I osteotomy,\textsuperscript{7,8} soft tissue manipulation near the mandible,\textsuperscript{9} and procedures near the skull base.\textsuperscript{10} The OCR may be a subset of a more encompassing trigeminocardiac reflex.\textsuperscript{3,10}

We report the OCR resulting in episodes of profound bradycardia and brief asystole during manipulation within a previously enucleated empty orbit. There have been numerous reports describing the OCR during procedures on the eye where orbital structures are intact, but only one prior report of the OCR during a procedure involving a previously enucleated orbit to our knowledge.\textsuperscript{10} OCR from direct manipulation of the optic nerve was a key part of this report, but it is consistent with reports of OCR precipitated by optic nerve clamping during enucleation.\textsuperscript{11}

The occurrence of the OCR in the empty orbit demonstrates that orbital structures containing stretch receptors are not required for initiation of the OCR. Therefore, patients remain at risk for OCR during subsequent procedures involving the orbit even after enucleation or during fitting of an oculoprosthes

CASE REPORT

The patient was an 87-year-old man (65-kg, 165-cm) with hypertension, gastro-oesophageal reflux disease, thyroid cancer, parotid cancer, and right periorbital basal cell carcinoma invading the right ethmoid sinus. Functional endoscopic sinus surgery and orbital exploration was scheduled for excision of recurrent basal cell carcinoma. Rapid sequence induction and intubation was uneventful. During right orbital base curettage, the patient experienced several precipitous episodes of profound bradycardia or brief asystole. After surgery, the patient denied cardiac symptoms, and cardiac enzymes were all normal. Oculocardiac-mediated bradyarrhythmias are easily elicited from empty orbits.

INTRODUCTION:

The oculocardiac reflex (OCR) is a well-described cardiac depressor reflex that may result in significant cardiac rate or rhythm changes, sinus and junctional bradycardia, heart block or asystole. It is well known that the afferent pathway and the vagus nerve as the efferent pathway of the OCR is mediated by the ciliary nerves that form the ciliary ganglion, which in turn contributes to the ophthalmic branch of the trigeminal nerve. The ophthalmic branch of the trigeminal nerve serves the globe. The stretch receptors in these structures are innervated by the ciliary nerves that form the ciliary ganglion, which in turn contributes to the ophthalmic branch of the trigeminal nerve. The stretch receptors in these structures are innervated by the ciliary nerves that form the ciliary ganglion, which in turn contributes to the ophthalmic branch of the trigeminal nerve. These afferent pathways converge in the sensory nucleus of the trigeminal nerve. The efferent pathway of the OCR is mediated by the motor nucleus of the trigeminal nerve resulting in the negative chronotropic and dysrhythmic effects on the heart (figure 2).\textsuperscript{6}

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REFERENCES