

REFLEX BRADYCARDIA IN CRANIOFACIAL SURGERY: REPORT OF THREE CASES

A.A.TAHER

From the Department of Oral and Maxillofacial Surgery, Baqiet Ulla General Hospital, Tehran, Islamic Republic of Iran.

ABSTRACT

Three cases who underwent surgery in different areas of the craniofacial region were reported with bradycardia developing intraoperatively during flap traction. Many cases of the oculocardiac reflex during treatment of the orbital region have been reported in the literature. This manuscript recorded that reflex bradycardia can occur during traction or stretching of any structure innervated by the trigeminal nerve and thus the name trigeminal-vagal reflex is better than the name oculocardiac reflex.

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INTRODUCTION

The oculo-cardiac reflex was first described in 1908. Bernard Aschner of Vienna, and Guiseppe Dagnini of Bologna in simultaneous independent reports, were first to describe the oculo-cardiac reflex (OCR) as a slowing of the heart in response to the application of pressure on the eye ball. This manuscript is to report three cases of bradycardia during the oral-craniofacial surgery.

CASE REPORTS

Case 1

In 1983, a 24-year-old male was referred to the O.M.F. Surgery service at Najmeia hospital, by his dentist for treatment of his symptomatic right mandibular exostosis. The patient had a history of swelling in the right body of the mandible since three years previously. He was healthy, and had no history of medical or dental problems. Surgery was done under general anesthesia; atropine was not used. During surgery the heart rate dropped to 35 beats/minute; release of pressure on the mucoperiosteal flap resulted in a return of the normal beat of 60 beats/minute. Atropine 0.5 mg intravenously was given and prevented further bradycardia, and the procedure continued uneventfully. The patient's recovery was uncomplicated.

Case 2

In 1985, a healthy 20-year-old male presented for

removal of a bony mass in the right supraorbital rim. Patient was with no history of any medical or dental problems. Under general anesthesia atropine was not used in premedication. Via a bicoronal incision, the bony mass was explored. During elevation of the pericranium over the frontal bone, the pulse rate suddenly fell to 40 beats/minute. With release of the elevation, the pulse rate returned to normal. 0.5mg atropine was given and the operation was completed without complications.

Case 3

In 1988, a 58-year-old man was referred to our clinic by his ophthalmologist due to a sharp bone in the right infraorbital rim since one year ago. The patient had a history of trauma to his face and sustained orbital injury, and was treated before in other hospitals. He had a history of complete tooth extraction, and a history of cataract surgery before. Under general anesthesia via the infraorbital incision, the sharp area was explored. During the exploration the pulse rate suddenly dropped to 25 beats per minute. Atropine 0.6mg intravenously was given. The pulse rate returned to normal shortly. Again when the periosteum was retracted, the pulse dropped. The operation was completed without further complications.

DISCUSSION

The oculo-cardiac reflex (OCR), is a slowing of the

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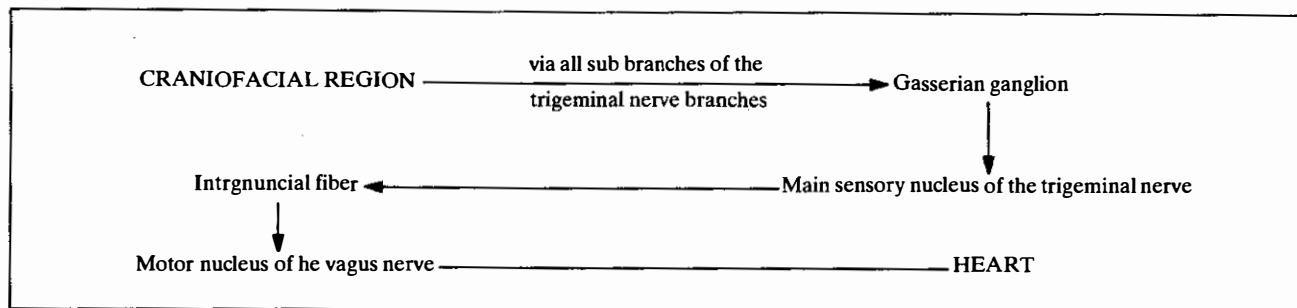


Fig. I The reflex pathway of the TVR.

heart rate in response to the application of pressure to the eye ball. Pressure on the eye ball has been used therapeutically to treat paroxysmal atrial tachycardia.³ The reflex consists of bradycardia, nausea, faintness⁷, and progresses to cardiac arrhythmias (nodal, pigmental, and junctional rhythms), ectopic beat, atrioventricular block, and asystole.⁸ many reports have recorded this reflex associated with extraocular muscle surgery,⁵ or during enucleation of the eye, or procedures on the empty orbit.⁶ It has occurred during elevation of the zygoma, maxillary osteotomy, and diathermy to the tentorium cerebelli.^{4,9,10} The effect of this reflex occurs in 32% -- 90% of strabismus operations depending on the methods used and the criteria of the ovaluation chosen.

We believe the reflex mechanism is the trigemino-vagal reflex (TVR), through one nerve of trigeminal branches or sub-branches, or via main branch of the trigeminal nerve to the gasserian ganglion via sensory nucleus of the trigeminal nerve in the floor of the fourth ventricle. short internuncial fibers in the reticular formation connect with efferent pathways from the mother nucleus of the vagus nerve to the depressor or nerve ending in the muscular tissue of the heart (Fig. 1). From our report and from other reports, we can consider that the oculo-cardiac reflex is one of the manifestations of the trigemino-vagal reflex.^{2-4,9,11}

Because the trigemino-vagal reflex can occur at any

time during cranio-facial surgery, we advise the following points:

- 1- Premedication must contain atropine or glycopyrrolate.
- 2- Heart monitoring for each patient undergoing operation in the O.C.M.F. region, is important.
- 3- Routine electrocardiogram before operation for detection of abnormality in the heart is important.

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