Traumatic Dysgeusia, an Unusual Complication of Facial Trauma: A Case Report

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The chemical senses of taste and smell are important to human life, because they play an important role in detecting potential environmental hazards. Humans can identify countless different flavors by the simultaneous perception of taste and smell. Reports of sensory loss after craniocerebral trauma began to appear in the medical literature in the middle 1800s. Dysgeusia associated with head injuries is rare and its reported incidence is 0.4 to 0.5%. This report describes the clinical case of a 32-year-old man with Le Fort I and III fractures treated with surgical reduction and fixation. The patient presented with dysgeusia after slight improvement of his preoperative anosmia. The prognosis is favorable and the treatment is prospective.

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Malfunctions in the chemical senses of taste and smell are often undervalued by lay people and health professionals. However, these senses define food and drink flavors and help in the detection of potential environmental hazards.[1]

Flavor is mediated by specialized neuroepithelial cells grouped into organs called *taste buds,* which are responsible for detecting a wide range of soluble chemical elements when they are exposed to the tongue.[2]

The variety of flavors might seem immeasurable; however, most researchers classify them into 5 basic groups, namely salty, sour, sweet, bitter, and umami. The innermost part of the tongue is more responsive to sweet, the outermost part is more responsive to bitter, and the sides are more responsive to salty and sour. Humans can perceive countless different flavors by adding taste to smell.[3]

Taste buds in the anterior two thirds of the tongue are innervated by the tympani chorda nerve (a branch of the facial nerve, ie, cranial nerve VII). The glossopharyngeal nerve (cranial nerve IX) innervates the taste buds of the posterior third of the tongue, and special sensory fibers of the vagus nerve (cranial nerve X) are responsible for the taste buds of the posterior pharynx.[4]

Metal ions such as nickel (Ni^{2+}), zinc (Zn^{2+}), and copper (Cu^{2+}) can change the detection and recognition levels of taste, because they affect the minimum concentrations at which salt, sugar, urea, and acid are recognized.[5]

Reports describing the loss of smell and taste after craniocerebral trauma began to appear in the medical literature in the middle 1800s.[6] Dysgeusia (altered taste) associated with head injury is a rare condition, with an incidence of 0.4 to 0.5%.[7] Possible causes are injuries to the tongue, to cranial nerves VII, IX, or X, or to the brainstem.[6]

This report describes a clinical case and discusses an unusual complication of facial trauma.

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Report of Case

A 32-year-old man was admitted to the Londrina State University Hospital (Londrina, Brazil) on July 14, 2013 after an automobile accident. Upon arrival at the hospital, his Glasgow scale score was 15. He denied any addictions, allergies, comorbidities, or medication use. The neurosurgery team was responsible for the initial assessment and management because he presented with mild craniocerebral trauma, pneumoencephalos, and fractures of the C3 and C4 vertebrae.

An oral and maxillofacial surgery consult was requested because the patient complained of pain and difficulty bringing his teeth together. At initial evaluation by the team, he reported facial pain, anosmia, and changes in his dental occlusion. During physical examination, facial edema, bilateral periorbital ecchymosis, mild restriction in the supraversion of the right eye, epistaxis, bone misalignment in the frontozygomatic sutures and zygomaticomaxillary buttresses, anterior open bite, and maxillary mobility compatible with a Le Fort fracture were found.

Computed tomography confirmed the presence of Le Fort I and III fractures. Surgical treatment under general anesthesia was planned. After orotracheal intubation, the tube was reversed to a submental approach to allow for intermaxillary fixation during surgery. The aim of the procedure was to reduce and fix the fractures with titanium plates and screws through a bilateral vestibular sulcus approach and a coronal approach.

The patient recovered uneventfully, with proper healing of the soft tissue approaches, stable occlusion, and no esthetic compromise. After 5 months of follow-up, he presented an improvement of the anosmia but complained of an altered sense of taste. He reported the inability to taste chocolate, sweetened coffee, and pork. Instead of perceiving the sweet taste of sweetened coffee and chocolate or the salty taste of pork, he perceived an intense bitter taste.

The patient underwent a sequence of blind taste tests, starting with saccharose and NaCl solutions at a concentration of 1 mol/L, according to previous studies.[8] The solutions were prepared at the State University of Londrina biochemistry laboratory and were applied at 4 specific points on the tongue (right anterior, left anterior, right posterior, and left posterior). Between applications, the patient was told to rinse his mouth with deionized water 15 mL. He was asked to describe the flavor and intensity he perceived at each application on a scale from 1 to 9.

Because the patient's chief complaint was related to chocolate, a second test was conducted using chocolate, in which he tasted chocolate tablets of equal size (5 × 5 × 5 mm) with different percentages of cocoa (0, 28, 34, 41, 70, and 85%). Between tastings, the patient rinsed twice with deionized water 15 mL.

During the first test, he reported intensity 5 of sweet flavor to saccharose in the anterior right portion and the left front side of the tongue, intensity 4 of sweet flavor in the right rear portion, and intensity 2 of sweet flavor in the left rear portion. To NaCl, he reported intensity 7 of bitter flavor in the right anterior part, intensity 4 of bitter flavor in left anterior part, intensity 8 of bitter flavor on the right rear part, and intensity 6 of bitter taste in the left rear part (Fig 1).

At the second test, he reported intensity 7 of bitter flavor and intensity 6 of sweet flavor for 0% cocoa; intensity 7 of bitter flavor and intensity 6 of sweet flavor for 28% cocoa; intensity 8 of bitter flavor and intensity 2 of sweet flavor for 34% cocoa; intensity 7 of bitter flavor and intensity 3 of sweet flavor for 41% cocoa; and intensity 9 of bitter flavor for 70% cocoa. When tasting 85% cocoa chocolate, the patient reported intensity 9 of bitter flavor (Table 1).

Thirty minutes after the 2 tests, the patient's tongue was anesthetized with topical anesthetic solution (10% lidocaine) and the 2 tests were repeated. This time, to saccharose, the patient described intensity 4 of sweet flavor in the right anterior part of the tongue, intensity 3 of sweet flavor in the left anterior part, intensity 5 of sweet flavor in the right rear part, and intensity 4 of sweet flavor of in the left rear part. To NaCl, he reported intensity 2 of salty flavor in the anterior right portion of the tongue, intensity 4 of salty flavor in the left anterior part, intensity 3 of salty flavor in the right rear part, and intensity 3 of salty flavor in the left rear part (Fig 2).

Under anesthesia, the results of the chocolate tests were intensity 3 of sweet and intensity 1 of bitter for 0% cocoa, intensity 3 of bitter and intensity 2 of sweet for 28% cocoa, intensity 3 of bitter and intensity 1 of bitter for 34% cocoa, intensity 1 of bitter and intensity 1 of sweet for 41% cocoa, intensity 2 of bitter and

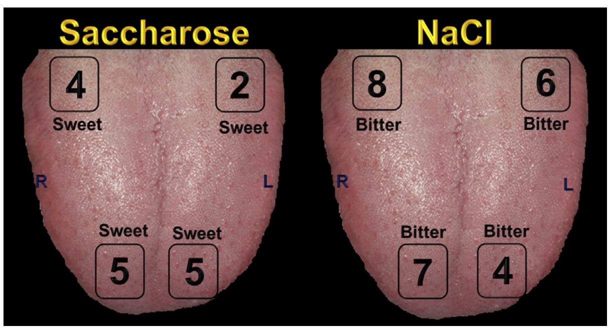

FIGURE 1. Intensity and flavor at different tongue areas, without topical anesthesia, using saccharose 1 mol/L and NaCl 1 mol/L.

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