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## Case Presentation

# Traumatic Neuropathy of the Trigeminal Nerve in a College Trumpet Player: A Case Report

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## Abstract

A 20-year-old college trumpet player presented with a 3-month history of upper lip numbness and worsening playing ability after a marching band performance. Examination demonstrated anesthesia of the upper lip that followed the borders of the trumpet mouthpiece. While playing, the patient had poor range and an airy tone quality. A prescription of complete embouchure rest for 6 weeks and a tailored return to play regimen resulted in resolution of upper lip numbness and improved trumpet playing. Neuropathy of the lip in a brass player is uncommon but highlights the uniqueness of injuries that may be sustained by performing artists.

**Level of Evidence:** To be determined

## Introduction

Peripheral nerve injuries have a wide variety of causes, including stretch, laceration, and compression [1]. Mononeuropathies sometimes may be difficult to diagnose and may be more challenging for a provider to diagnose in unfamiliar special populations who sustain focused injuries. We present a patient with bilateral mononeuropathy of the upper lip secondary to playing the trumpet. Complete rest from playing brass instruments and a tailored return to play regimen resulted in resolution of the patient's symptoms.

## Case Presentation

A 20-year-old male college trumpet player presented to our clinic with numbness in the upper lip and progressively worsening ability to play the trumpet. Symptoms began during a halftime show with his college marching band 3 months before presentation. During the performance, the patient was playing a high note that he had been instructed to play as loudly as possible, and he felt immediate sharp pain and numbness of the bilateral upper lip. He was unable to play his trumpet the rest of the day. Pain resolved over the next few days, but the numbness persisted. The patient was unable to perceive his upper lip placement and upper lip

movements when he tried to play his instrument. He did not complain of motor deficits. The patient reported he was unable to sense the temperature of liquids when he drank. He did not complain of any nasal symptoms or symptoms involving the teeth or gums. The patient denied any recent changes in playing equipment or playing technique. He refrained from playing his trumpet a few days but was not able to take off more time due to his college playing requirements. As a music education major, he also was required to play other brass instruments in one of his music education classes. His playing continued to deteriorate despite practicing fewer hours per day. He tried using ice and ibuprofen and altered his embouchure without benefit.

Physical examination revealed altered sensation of the upper lip in a 2-cm semicircular pattern, consistent with the placement area of the patient's trumpet mouthpiece (Figure 1). This area was in the distribution of bilateral infraorbital nerves, part of the maxillary branches of the trigeminal nerves (Figure 2). There was complete loss of light touch and pinprick sensation left of midline and diminished sensation to light touch and pinprick right of midline. Inspection of the oral mucosa demonstrated a semicircular area of purplish-blue discoloration on the inside of the upper lip mirroring the area of sensory loss. The patient was not dysarthric but was unable to whistle. Sensation to the rest of the



**Figure 1.** Patient using an embouchure visualizer, which allowed us to observe his embouchure and mouthpiece placement while buzzing notes.

face was intact, and all cranial nerves were grossly normal. There was no swelling present in the upper lip. The patient had normal muscle tone and strength in upper and lower lips and in muscles of mastication. There were no dental deformities, anterior tooth surfaces were smooth, and there were no visible or palpable deformities of the upper lip. As part of our physical examination, we performed an evaluation of the patient's trumpet-playing technique, proficiency, and sound quality while he played his instrument. His tone on the trumpet was airy in quality, and range was limited to within the musical staff. Based on clinical examination, the patient was diagnosed with compression injury of bilateral infraorbital nerves.

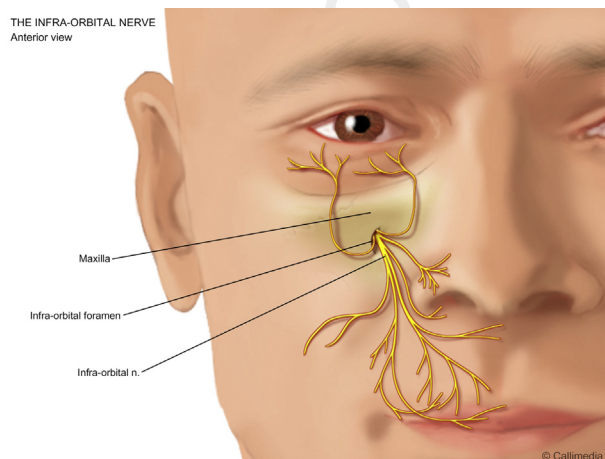
Our treatment consisted of 6 weeks of complete embouchure rest followed by easing into return to play by softly playing long tones, scales, and lip slurs while consciously thinking about using little to no pressure and using a mirror during practice to visualize playing mechanics. Seven weeks later, the patient returned to the clinic. He reported having been compliant with complete rest and returned to play as instructed. He stated his sensation had returned 1-2 weeks before

follow-up, and his playing had improved within days of returning to play. He also reported being able to distinguish warm and cold liquids when drinking. However, he experienced dysesthesia immediately after playing that lasted fewer than 5 minutes. On examination at follow-up, sensation of the upper lip was normal to light touch and pinprick bilaterally. Discoloration of oral mucosa had resolved, and the patient was able to whistle. On the trumpet, his tone quality was improved, and his range was increased. A second follow-up visit 1 month from his initial follow-up visit was to be scheduled by the patient on completion of his school semester. However, the patient did not schedule this second follow-up visit.

## Discussion

This case highlights a unique neurologic injury that may affect performing artists. Our patient's neuropathy was caused by excessive mouthpiece pressure while playing the instrument. Because of the entirety of our patient's symptoms involving just the upper lip, the superior labial nerves, which are distal branches of the infraorbital branches of the trigeminal nerve, were most likely involved. Intra-oral numbness would have suggested involvement of the nasopalatine nerve and anterior superior alveolar nerve, which are trigeminal nerve branches proximal to the infraorbital nerve. Although there is not usually a clear boundary for the transition between the trigeminal nerve and alveolar nerve coverage, the anterior superior alveolar nerve typically does not involve the lip.

Mouthpiece pressure is a frequently discussed topic among brass musicians. The sound of a brass instrument is produced by pursing the lips together to form an aperture and blowing sufficient air through the aperture to create a buzzing sound. Playing higher notes requires a smaller aperture and an increase in lip muscle strength to hold the smaller aperture. Increased lip strength also is required to hold the same aperture diameter as one plays at louder volumes by forcing more air through the aperture. Brass players of all skill levels apply more inward force of the mouthpiece against their lips and teeth as they play notes that are higher in the instrument's range and as they play louder volumes. Pressures as low as 30 mm Hg may lead to acute nerve compression [2]. Among trumpet players, mouthpiece forces have been measured in excess of 100 N (10.2 kg), and brass instrument players have been known to have tooth displacement of up to 180  $\mu$ m while playing [3,4]. Because tooth abnormalities and dental appliances may predispose the lips to injury by creating a compression effect of the lips, it is always important to include a dental examination as part of the physical examination. In inexperienced or unconditioned players, excess mouthpiece pressure is used as a compensatory mechanism for lack of lip muscle



**Figure 2.** Distribution of infraorbital branch of the trigeminal nerve to the upper lip. Reproduced with permission from Callimedica.

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