

INTRODUCTION

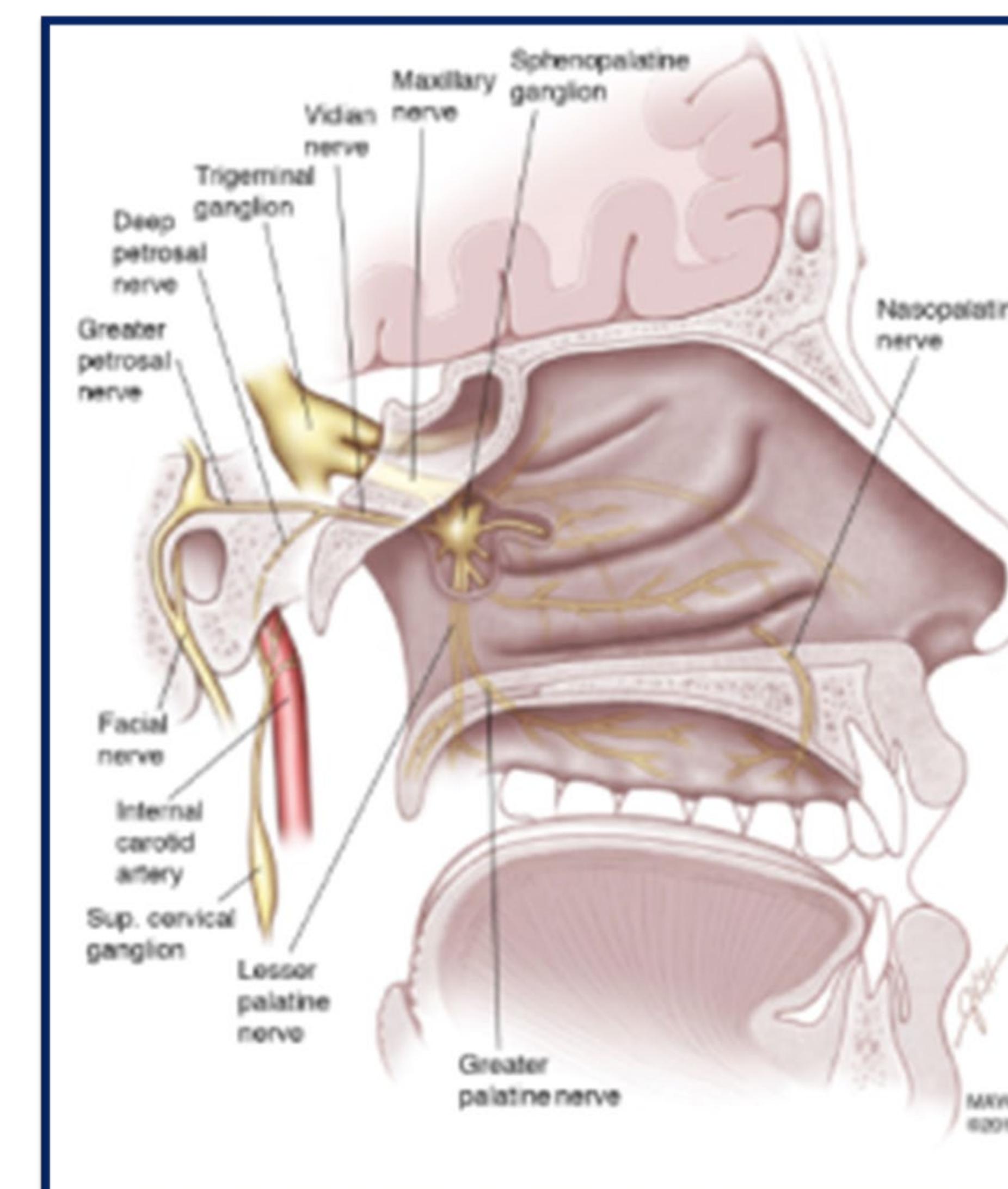
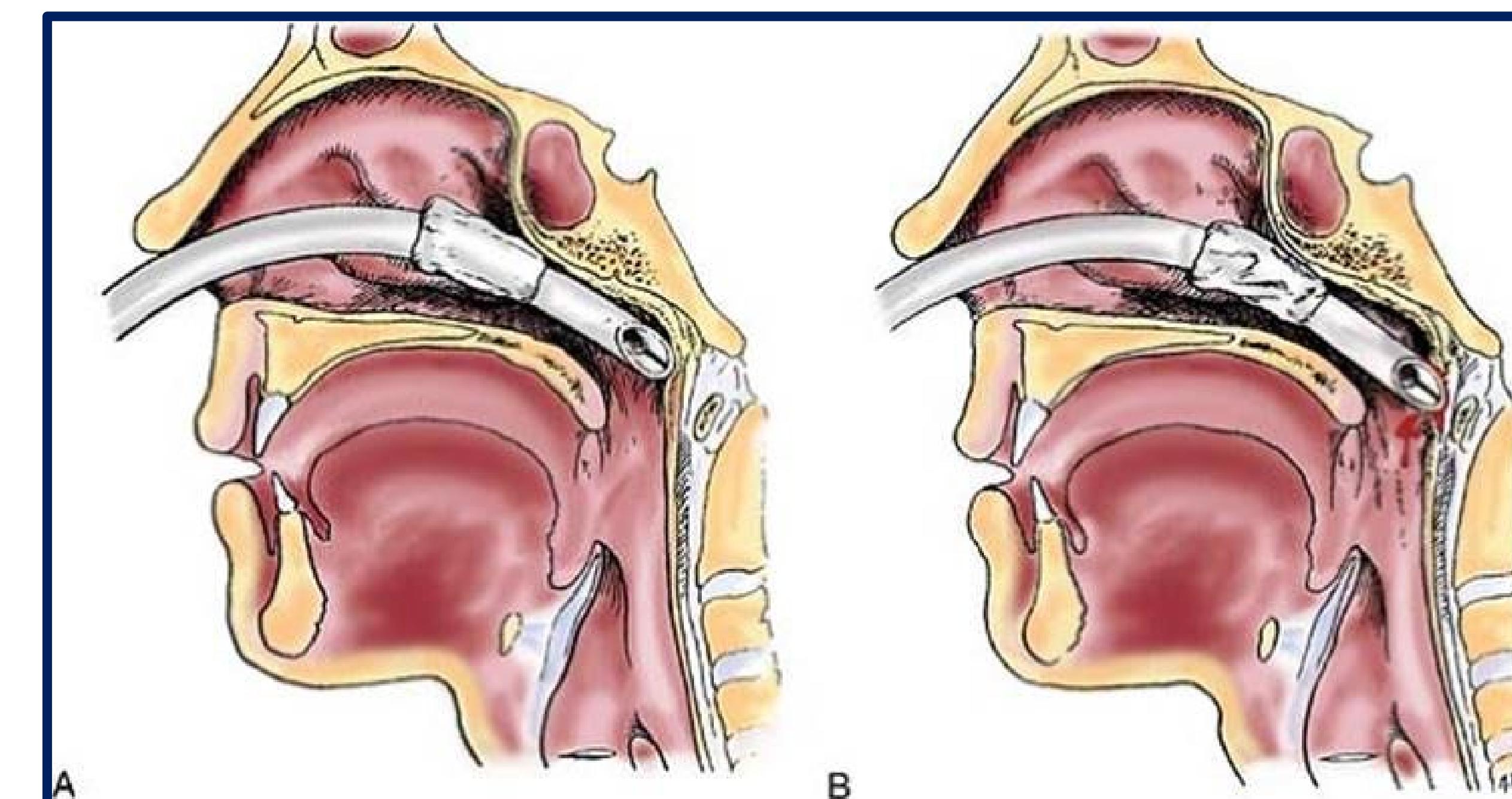
The trigeminal-cardiac reflex (TCR) is a brainstem reflex that manifests as hemodynamic disturbances similar to those seen in vasovagal syncope. We present a case of a 71-year-old male patient whose hospital course was marked by recurrent hypotension, bradycardia, and apnea following stimulation of the maxilla-mandibular branches of the trigeminal nerve.

CASE REPORT

A 71-year-old male patient with no significant past medical history presented to the hospital with left-sided weakness and a change in mental status. EMS placed a nasopharyngeal airway (NPA) in the field for airway protection. He was diagnosed with a mid-basilar artery occlusion and dissection, and he was subsequently treated with tissue plasminogen activator (tPA) and taken for a mechanical thrombectomy and stent. His trajectory for recovery from his cerebrovascular accident was unremarkable, and he was expected to recover with minimal deficits. However, on hospital day 3, the rapid response team was called for recurrent epistaxis. Nasal packing had been placed in the right naris, but the patient was bleeding around the packing. Staff began applying pressure to bilateral nares, and the patient immediately became bradycardic to the low 30s, hypotensive with mean arterial pressure (MAP) <65, decreased responsiveness, and with episodes of apnea. Throughout his hospitalization, he had multiple episodes of similar hemodynamic perturbations associated with epistaxis. At one month, the patient's hospitalization continues for recurrent epistaxis secondary to traumatic NPA placement.

DISCUSSION

The trigeminal cardiac reflex (TCR) is a brainstem reflex that causes sudden onset changes in blood pressure and heart rate, as well as apnea. TCR is traditionally classified according to two subtypes, peripheral stimulation and central stimulation. Central TCR is enumerated in many case reports; however, peripheral TCR is less commonly described in the literature. Peripheral TCR occurs when the V2 and V3 branches of the trigeminal nerve are stimulated, manifesting in bradycardia, hypotension, and apnea.



CONCLUSION

In this case, we hypothesize peripheral TCR was stimulated after trauma to the soft tissue and damage of the nasal mucosa from a nasopharyngeal airway tube. This predisposed our patient to episodes of hypotension and bradycardia following pressure to nares applied for controlling his epistaxis.

MANAGEMENT

Treatment in some cases will involve removing the nasal balloons or packings and terminating manual pressure to the nares to stop the stimulation of afferent trigeminal neurons, preventing further incidence. In conclusion, having a high index of suspicion for possible TCR stimulation allows providers to be prepared for subsequent hemodynamic compromise, ensuring patient safety.

REFERENCES

- Meuwly C, Golanov E, Chowdhury T, Erne P, Schaller B. Trigeminal cardiac reflex: new thinking model about the definition based on a literature review. *Medicine (Baltimore)*. 2015 Feb;94(5):e484. DOI: 10.1097/MD.0000000000000484. PMID: 25654391; PMCID: PMC4602726.
 - Schaller B, Probst R, Strelbel S, Gratzl O. Trigeminocardiac reflex during surgery in the cerebellopontine angle. *J Neurosurg* 1999; 90:215–220.
 - Jaiswal AK, Gupta D, Verma N, Behari S. Trigeminocardiac reflex: a cause of sudden asystole during cerebellopontine angle surgery. *J Clin Neurosci* 2010; 17:641–644.
 - Kumada M, Dampney RA, Reis DJ. The trigeminal depressor response: a novel vasodepressor response originating from the trigeminal system. *Brain Res* 1977; 119:2.
 - <https://lupinepublishers.com/neurology-brain-disorders-journal/fulltext/the-relationship-of-the-trigemino-cardiac-reflex-to-sleep-bruxism.ID.000106.php>
- Images from <https://doctorlib.info/medical/airway/4.html>