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Case Report: Abnormal Movements of the Tongue Years after Tonsillar Cancer Treatment

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Abstract

This case describes a 52-year-old female who presented with abnormal movements of the left side of her tongue. The patient was diagnosed with radiation induced myokymia of the tongue. This diagnosis was established based on history and exam findings, while also ruling out the original concern of recurrence of her tonsillar cancer using MRI imaging. The standard for diagnosing myokymia is through the use of electromyographic studies, however this study was not possible with the resources at the hospital.

Keywords

Myokymia, Tongue, Radiation, Tonsillar Cancer

Introduction

Myokymia, otherwise defined as uncontrollable muscle fasciculations of the tongue, is a relatively rare occurrence [1,2]. Its etiology can be attributable to tumors invading local nerves, radiation-induced nerve damage, or even idiopathic causes. Radiation-induced nerve damage specifically is acquired due to local ischemia caused by blood vessel damage from radiation and axonal damage occurring secondary to radiation [3]. The area of nerve tissue damage is dependent on the location of radiation applied [3]. As a result of the damage, sites along the axon become altered, leading to biochemical changes that cause a modification to the membrane excitability [3]. This, as a whole, results in spontaneously generated myokymic discharges [4]. These myokymic discharges can occur as doublets or triplets, leading to rhythmic fasciculations and a quivering appearance of the muscle [4]. Typically, myokymia affects the muscles of the face, with an eyelid twitch being one of the most common presentations of myokymia. Unremitting myokymia is treated with muscle relaxants or anticonvulsants [5].

Currently, the literature has reported a few cases of tongue myokymia occurring months to years after exposure to radiation [1,6,7] Tongue myokymia secondary to radiation is likely due to damage to the hypoglossal nerve, which leads to localized twitching. When considering a patient with an oncological history, the occurrence of myokymia is typically related to radiation-induced neuropathy rather than cancer

recurrence [8]. We report the case of a woman who developed hypoglossal neuropathy five years after her radiation therapy for tonsillar cancer.

Case Presentation

This patient is a 52-year-old female with a past medical history of TIA, diabetes, and tonsillar cancer, who underwent 8 sessions of chemotherapy and 33 sessions of radiation to the left neck in 2018 at UCSF. She was sent to the emergency department by her primary care provider (PCP) due to abnormal movements on the left side of her tongue (**Video-1 - Still Frame**). Her PCP wanted her to seek medical attention immediately as they suspected a recurrence of her tonsillar cancer. The patient states that she first noticed the wave-like movements of her tongue approximately 1.5 weeks ago. She cannot "feel" the movements occurring inside her mouth but noticed the waves when she was brushing her teeth. She has been monitoring the movements daily but has not noticed any improvement or worsening.

Video-1 Still Frame: Patient Abnormal Movements of Left Tongue

The patient also reports random episodes of occasional twitching of the left eyebrow or left eyelid, but these episodes have only lasted anywhere from minutes to a few days in the past. She has not noticed these types of wave-like movements of her tongue before. The patient endorses that she occasionally has headaches, chronic left-sided neck pain, and occasional numbness in the left neck radiating to the left arm. She denies any unintentional weight loss, fevers, chills, fatigue, sore throat, difficulty swallowing, or difficulty with speech. The patient does endorse intentional 10-12 lbs weight loss after starting a Keto Diet recently. She denies any alcohol use, smoking, or illicit drug use. She does not take any medications on a daily basis.

The patient's height was recorded as 163 cm and her weight as 98 kg at the time of the encounter. Her vitals were within normal limits, with a temperature of 36.6°C, blood pressure of 127/76 mmHg measured from the left arm, heart rate of 75 beats per minute, respiratory rate of 13 breaths per minute, and oxygen saturation of 99% on room air. On examination, the patient appeared well-nourished and in no acute distress. There was scarring present on the left anterior neck, as seen in **Image-1**. The patient's oropharynx appeared atraumatic, without scarring or masses. The left side of the patient's tongue exhibited repetitive and rhythmic wave-like movements, which can be seen in Video-1 still image. Cranial nerve exams were all normal. The motor exam elicited 5/5 strength in all extremities, and sensation to light touch was intact in all extremities. There was no evidence of any focal neurological deficits.

Image-1: Patient Scarring on Left Anterior Neck

In the ED, the patient received an MRI of the brain with and without contrast, which showed no acute intracranial abnormality, no infarction, and no abnormal parenchymal enhancement. She also received an MRI of the face, neck, and orbit with and without contrast, which showed slight asymmetric prominence of the posterolateral left oropharynx. This prominence was noted to be stable when compared to a previous scan from March 2021 and was likely due to post-surgical/post-treatment changes. There was no discrete mass lesion. Although the next step in diagnosis was to conduct an electromyography (EMG), this tool was not available at the presenting hospital.

The plan was to trial the patient on carbamazepine 200 mg BID to see if this would resolve the issue. However, the patient's preference was to not begin any medication as the symptoms were not bothersome. Therefore, it was not necessary to treat the tongue myokymia at this time. The patient was also counseled on returning if the condition worsened and caused difficulty with speech, swallowing, or breathing. She also planned to follow up with the UCSF team and suggest an EMG study at that time.

Discussion

The case presented here highlights a rare occurrence of myokymia affecting the tongue. Myokymia, characterized by uncontrollable muscle fasciculations, typically manifests in various parts of the body, with facial muscles being a common location. However, the involvement of the tongue in this case adds a unique dimension to the presentation.

Myokymia of the tongue in this patient is likely the result of radiation-induced nerve damage, specifically affecting the hypoglossal nerve after she had undergone treatment for tonsillar cancer. Radiation therapy, while effective in treating cancer, can have adverse effects on surrounding tissues and nerves due to local ischemia and axonal damage [3]. These delayed effects are directly related to radiation dosage [8]. In this case, the patient had received radiation to the left neck for tonsillar cancer in 2018, which led to the development of myokymia five years later. The damaged nerve tissue underwent biochemical changes that affected membrane excitability, resulting in rhythmic fasciculations of the tongue.

The patient's chief complaint was abnormal movements of the left side of her tongue. The history revealed that these wave-like movements had been ongoing for approximately 1.5 weeks, and she first noticed them while brushing her teeth. Although she reported occasional twitching of the left eyebrow and eyelid in the past, these were distinct from the repetitive and rhythmic movements of her tongue. Furthermore, the patient experienced chronic left-sided neck pain and occasional numbness radiating to her left arm, which could be indicative of radiation-induced nerve damage.

Given the patient's history and clinical presentation, there was initial concern about the possibility of cancer recurrence, prompting the use of MRI imaging to rule out this potential complication. The MRI scans of the brain, face, neck, and orbit did not reveal any acute intracranial abnormalities or signs of cancer recurrence, but they did show post-surgical and post-treatment changes in the oropharynx [6]. These findings were consistent with the patient's medical history and were not indicative of a discrete mass lesion.

The standard method for diagnosing myokymia involves electromyographic studies [1]; however, these were not feasible due to resource limitations at the hospital. In such cases, treatment decisions must be based on clinical judgment and patient preference. Although the plan was to initiate treatment with carbamazepine 200 mg BID, the patient opted not to begin any medication as her symptoms were not bothersome.

The patient was counseled on the option to return if her condition worsened and started affecting speech, swallowing, or breathing. She also planned to follow up with the UCSF team and suggested an electromyographic (EMG) study at a later time. EMG studies are crucial for confirming the diagnosis of myokymia and evaluating its severity [4]. Regular follow-up and monitoring of symptoms will be essential in managing this rare presentation of myokymia.

Conclusion

This case of tongue myokymia secondary to radiation-induced nerve damage highlights the importance of considering unusual etiologies for clinical symptoms, especially in patients with a history of radiation therapy. While treatment may not always be necessary, close follow-up and collaboration with specialists can help in providing optimal care for patients with this rare condition. Further research and case studies are needed to expand our understanding of the long-term effects of radiation therapy on nerve tissue and its potential to cause myokymia in uncommon locations like the tongue.

Consent

Informed consent was obtained from the patient for the publication of this case report and accompanying images.

Conflict of Interest

All authors declare no conflicts of interest in this paper.

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