

# Rehabilitation and Osteopathic Manipulative Medicine for a Patient with Dysphagia secondary to Hyoid Somatic Dysfunction: A Case Report

Gilbert Siu, DO, PhD<sup>1</sup>, Anjuli Desai, MD<sup>1</sup>, Barkha Manne, MD<sup>1</sup>, Michael Weinik, DO<sup>1</sup>, and David Mason, DO<sup>2</sup>

<sup>1</sup>Department of Physical Medicine & Rehabilitation, Temple University Hospital, Philadelphia, PA

<sup>2</sup>Neuromusculoskeletal Institute, UMDNJ-School of Osteopathic Medicine, Stratford, NJ



## ABSTRACT

**Setting:** Neuromusculoskeletal and Rehabilitation Clinic

**Patient:** A 25-year-old healthy female

**Case Description:** The patient sustained a cervical acceleration-deceleration injury (whiplash) from rear end motor vehicle collision. After the whiplash injury, she presented with neck pain, headaches, and dysphagia. After physical therapy to neck and pain management, the patient continued to complain of persistent dysphagia. Magnetic resonance imaging and computed tomography of the head and neck were normal. Subsequently, she underwent upper endoscopy and electrodiagnostic studies, where the results were normal.

**Results:** The patient was examined with an osteopathic palpatory diagnosis documenting specific somatic dysfunctions by finding palpable tissue texture changes, asymmetry to motion, range of motion deficits and areas of tenderness at the neck. She presented with a left hyoid asymmetry with decreased range of motion and left digastric and hyoid muscle tenderness and tightness. The left sternocleidomastoid muscle was tender and the cervical spine had multilevel somatic dysfunctions. The patient underwent osteopathic manipulative medicine, consisting of myofascial release and muscle energy to the hyoid and anterior neck muscles with cervical high velocity low amplitude manipulation. After three sessions of osteopathic manipulative treatment and a home rehabilitation program consisting of anterior cervical muscle stretching, range of motion, and strengthening, the patient was reexamined and found to have decreased tissue texture changes, less restriction of motion and improved range of motion accompanied by an improvement in swallowing.

**Discussion:** Whiplash injuries usually lead to soft-tissue injury, and most clinicians focus on the posterior neck as the cause of the pain symptoms. The anterior neck, on the other hand, is often overlooked. Soft-tissue injuries and somatic dysfunctions in the anterior neck, particularly the hyoid bone, may result in dysphagia. To our knowledge, this is the first reported case of hyoid somatic dysfunction causing dysphagia.

**Conclusion:** Clinicians should be aware of this etiology, especially if imaging and electrodiagnostic studies are normal.

**Keywords:** Dysphagia, Hyoid, Osteopathic, Rehabilitation

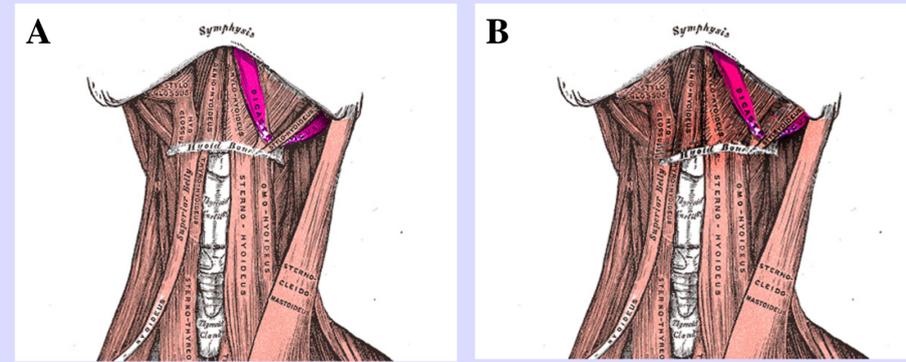
## CASE DESCRIPTION

A 25-year-old healthy female sustained a cervical acceleration-deceleration injury (whiplash) from rear end motor vehicle collision. Initially, she presented with neck pain and headaches. A week later, she presented with difficulty swallowing food and felt that she always had something stuck in her throat. She denies any previous history of dysphagia. Since her neck pain was the main issue, she was started on physical therapy for pain management; however, throughout the therapy course, she continued to complain of persistent dysphagia. **Imaging:** Magnetic resonance imaging and computed tomography of the head and neck were unremarkable. **Endoscopy and Electrodiagnostics:** She was then referred to an otolaryngologist for an upper endoscopy study and a neurologist for electrodiagnostic studies of her neck muscles. All of these results were normal.

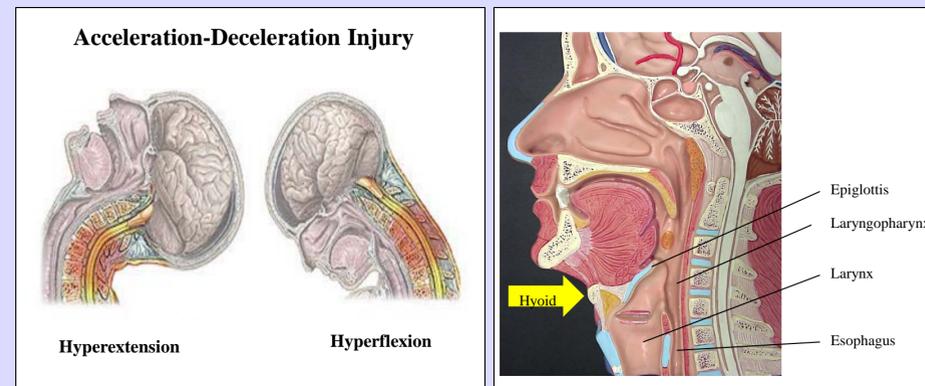
After a few years of having dysphagia, she was finally referred to a physiatrist and osteopathic neuromusculoskeletal specialist.

**Examination:** Osteopathic palpatory examination demonstrated specific somatic dysfunctions by finding palpable tissue texture changes, asymmetry to motion, range of motion deficits and areas of tenderness at the neck, particularly the anterior neck. She presented with a left hyoid asymmetry with decreased range of motion and left digastric and hyoid muscle tenderness and tightness. The left sternocleidomastoid muscle presented with tenderness and the cervical spine had multilevel somatic dysfunctions.

**Treatment and Rehabilitation:** The patient underwent osteopathic manipulative medicine, consisting of myofascial release and muscle energy to the hyoid and anterior neck muscles with cervical high velocity low amplitude manipulation. After three consecutive sessions of osteopathic manipulative treatment within a 3 week period and a home rehabilitation program consisting of anterior cervical muscle stretching, range of motion, and strengthening, the patient was reexamined and found to have decreased tissue texture changes, less restriction of motion and improved range of motion accompanied by an improvement in swallowing.



**Figure 1. Schematic diagram of the anterior neck** (A) Normal alignment of the hyoid bone without somatic dysfunctions present. (B) Slight displacement of the hyoid to the left leading to hyoid bone and muscles somatic dysfunctions (images modified from Gray's Anatomy)



**Figure 2. Diagrams of cervical acceleration-deceleration injury and the midsagittal neck.** The diagrams illustrates the close proximity of the hyoid, larynx, laryngopharynx, and esophagus. An acceleration-deceleration injury can lead to a somatic dysfunction of the hyoid, resulting in a translational effect on these structures, and ultimately dysphagia.



**Figure 3.** An illustration demonstrating the osteopathic manipulative treatment on the neck.

## Somatic Dysfunction

- T** Tenderness
- A** Asymmetry
- R** Restriction
- T** Tissue Texture Changes

**Table 1.** Somatic Dysfunction Classification

## DISCUSSION

Cervical acceleration-deceleration injury (whiplash syndrome) is a relatively common injury in patients after a motor vehicle collision. The forces of the collision cause trauma to the cervical spine and damage cervical musculature, ligaments, bones, joints, and fascia, leading to pain and discomfort to in these individuals. Most of the patients usually complained of muscle spasms, headaches, and pain at the posterior neck and upper back. Rarely, patients will complain of dysphagia or dyspnea. In this case, our patient complained of persistent dysphagia following her acceleration-deceleration injury. She underwent multiple studies, where all of the studies were normal. She finally received an osteopathic and physiatric evaluation and was diagnosed with a hyoid somatic dysfunction.

The definition of an osteopathic somatic dysfunction is an impaired or altered function of related components of the somatic (body framework) system, consisting of skeletal, arthrodiary, myofascial, vascular, lymphatic, and neural structures, where the osteopathic palpatory diagnosis includes tenderness, asymmetry, restriction, and tissue texture changes. The patient's osteopathic examination revealed these structural changes at the left hyoid bone and associated muscles.

The hyoid is an important horse-shoe shaped bone with multiple functions. The bone contributes to airway protection and food bolus transport to the esophagus. A somatic dysfunction at the hyoid will alter the mechanics of the airway and swallowing. Studies have shown that a hyoid displacement will cause a decline in swallowing function, increased pharyngeal residue, slow bolus transit time, and may increase risk of aspiration. In addition, electrodiagnostic studies demonstrated that hyoid displacement leads to changes in muscle mass, fiber density, and functional motor units in the suprahyoid and thyrohyoid muscles, which can lead to dysphagia.

Unfortunately, imaging and endoscopic studies are unable to reveal subtle changes and somatic dysfunctions of the hyoid bone and muscles. Quantitative assessment of hyoid bone displacement using video-swallowing images have been used in patients with obvious hyoid displacement, but had limitations in patients with subtle hyoid changes.

To our knowledge, the application of osteopathic manipulative medicine for hyoid somatic dysfunction have not been reported in the literature. Osteopathic manipulative treatment should focus on the mobilization of the restricted hyoid bone in conjunction of treating other aspects of the neck, including digastric, sternocleidomastoid, hyoid, and poster neck muscles. Moreover, the importance of a rehabilitation program consisting of anterior cervical muscle stretching, range of motion, and strengthening should also be included in these patients.

## CONCLUSION

To our knowledge, this is the first reported case of a hyoid somatic dysfunction causing dysphagia from a cervical acceleration-deceleration injury. Therefore, clinicians should focus towards all anatomical aspects of the neck (looking at all aspects of the neck: anterior, lateral and posterior) for diagnosis, treatment, and rehabilitation.

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