

Botulinum Toxin for Cricopharyngeus Muscle Dysfunction in Dysphagia Therapy

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Description

Dysphagia or difficulty swallowing, is a condition that can significantly affect a patient's quality of life. It is a common symptom of a variety of underlying conditions, including neurological diseases, stroke, head and neck cancers and aging. One of the key contributors to dysphagia is Cricopharyngeus Muscle (CPM) dysfunction, which impedes the normal swallowing process. The cricopharyngeus muscle, a circular muscle located at the junction between the pharynx and esophagus, functions as a physiological barrier to prevent the aspiration of food into the airway. However, when this muscle does not relax properly, it can result in a range of swallowing difficulties. Botulinum Toxin (Botox) has emerged as a potential treatment option for managing CPM dysfunction and improving dysphagia symptoms. This article analyses the use of botulinum toxin in dysphagia therapy, specifically targeting crico-pharyngeus muscle dysfunction.

Botulinum toxin in dysphagia therapy

Botulinum toxin, a potent neurotoxin produced by *Clostridium botulinum*, has gained widespread clinical use for a variety of medical and cosmetic indications. When injected into muscles, botulinum toxin works by blocking acetylcholine release at the neuromuscular junction, leading to temporary muscle paralysis. In the context of dysphagia, botulinum toxin is used to relax hypertonic muscles, improving the function of the swallowing mechanism. For crico-pharyngeus muscle dysfunction, botulinum toxin is injected directly into the CPM to reduce its hypertonicity and improve swallowing. This treatment is considered less invasive than surgical interventions and offers a relatively rapid and effective solution for patients suffering from CPM-related dysphagia. The effects of botulinum toxin are temporary, lasting between three to six months, which allows for repeated treatments as needed.

Botulinum toxin acts by inhibiting the release of acetylcholine from motor nerve endings, which leads to the paralysis or relaxation of the injected muscle. In the case of CPM dysfunction, botulinum toxin targets the hyperactive crico-pharyngeus muscle fibers. By blocking acetylcholine release, botulinum toxin reduces the muscle's tone and prevents its excessive contraction. This leads to the relaxation of the upper

esophageal sphincter, allowing food to pass more easily from the pharynx into the esophagus. The relaxation of the CPM helps to restore normal swallowing function and alleviate symptoms of dysphagia, such as the sensation of food being stuck in the throat, regurgitation and aspiration.

Cricopharyngeus muscle dysfunction is often classified as either hypertonicity or paradoxical contraction of the muscle, where it fails to relax appropriately during swallowing. The CPM is a critical structure that facilitates the smooth transition of food from the pharynx to the esophagus. During normal swallowing, the CPM relaxes to allow the bolus to pass through, then contracts to prevent aspiration. Dysfunctional relaxation of the CPM results in a failure of the Upper Esophageal Sphincter (UES) to open properly, which leads to a sensation of food being stuck in the throat, regurgitation and sometimes aspiration. Cricopharyngeus muscle dysfunction can occur due to a variety of factors, including neurological conditions like stroke, Parkinson's disease or multiple sclerosis, as well as mechanical obstructions such as tumors. Additionally, post-surgical scarring, radiation therapy for head and neck cancers and aging can contribute to dysfunction of the CPM.

Cricopharyngeus muscle dysfunction

The use of botulinum toxin for CPM dysfunction has several notable benefits: Unlike surgery, botulinum toxin injections are minimally invasive and can be performed on an outpatient basis. This is a significant advantage for patients who are not suitable candidates for more invasive procedures or who wish to avoid the risks associated with surgery. The effects of botulinum toxin are temporary, typically lasting from three to six months. This allows patients to experience relief from dysphagia symptoms without permanent changes to the CPM. Additionally, the temporary nature of the treatment allows for periodic injections, providing ongoing management for chronic conditions. Numerous studies have shown that botulinum toxin injections into the crico-pharyngeus muscle result in significant improvement in swallowing function. Patients often report reduced symptoms of food impaction, regurgitation and aspiration after receiving the injections. Objective measures, such as video fluoroscopy or endoscopic evaluation, also demonstrate improved opening of the upper esophageal sphincter following treatment.

In cases where surgical options, such as crico-pharyngeal myotomy, are not appropriate, botulinum toxin offers a viable alternative. Surgery carries inherent risks, such as infection, scarring and changes in esophageal function. Botulinum toxin provides a less risky option, particularly for frail patients or those with complex medical histories. The side effects of botulinum toxin injections are generally mild and temporary. These may include mild dysphagia, voice changes or sore throat, but serious adverse events are rare. Additionally, botulinum toxin has been shown to have a favorable safety profile when

used in dysphagia therapy. Botulinum toxin has proven to be an effective and minimally invasive option for the treatment of crico-pharyngeus muscle dysfunction in patients with dysphagia. By temporarily relaxing the hypertonic muscle, botulinum toxin improves swallowing function and alleviates symptoms such as food impaction and aspiration. While the effects are temporary and repeated treatments may be necessary, botulinum toxin offers a valuable alternative to more invasive procedures, particularly for patients who are not candidates for surgery.