

## Abstract

A 65 year old male who presented with dysphagia attributable to a large (4x6cm) Zenker's diverticulum underwent open transcervical diverticulectomy and complete cricopharyngeal myotomy in August 2012 due to difficulty with endoscopic exposure. The patient had complete resolution of symptoms for the first 9 months of his post operative period.

In June 2013, he developed recurrent dysphagia and a new pouch distal to original site was seen on imaging. In November 2013, patient underwent endoscopic approach with diverticulotomy using stapler technique.

In November 2015, patient developed recurrent dysphagia and recurrent pouch, so repeat endoscopic approach was done. Intraoperatively, CO2 laser was used to get through the party wall, and staples were found embedded within re-grown thick cricopharyngeus muscle fibers. Due to this finding, Botulinum toxin type A 45 units was injected at the end of the myotomy into the cut edges of the muscle fibers to prevent re-growth and recurrence.

Presently, the patient is doing well 4 years after this last approach and barium esophagram demonstrates no recurrence thus far.

## Introduction

Zenker's diverticulum (ZD) is a pulsion diverticulum in the hypopharynx that is thought to be caused due to a lack of relaxation of the cricopharyngeus (CP) muscle during deglutition.

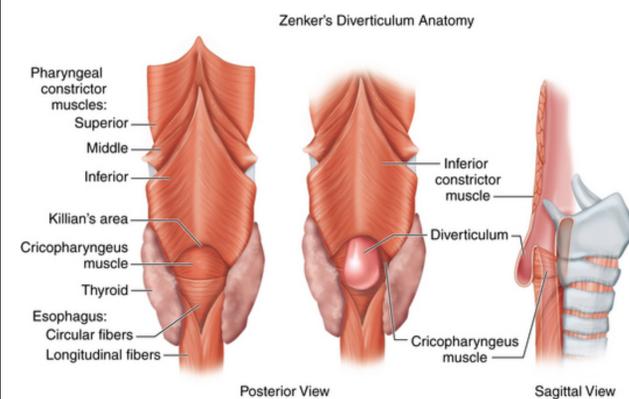
The annual incidence of ZD is estimated to be 2 per 100,000 and the annual prevalence is 0.01 to 0.11%. It has a male predominance and typically occurs in the seventh and eighth decades of life. Signs and symptoms frequently associated with ZD include halitosis, hoarseness, dysphagia, aspiration, regurgitation of undigested food, weight loss and appearance of neck mass.

A frustrating problem for patients, there are many approaches to treating a ZD. Unfortunately, recurrence remains a problem. Current conventional endoscopic surgical repair techniques include stapling diverticulotomy, carbon dioxide laser and the harmonic scalpel which have a suggested recurrence rates of 7.25%, 14.71% and 4%, respectively. Recurrences have been attributed to inadequate cricopharyngeal myotomy. There is little literature illustrating successful approaches to multiply recurrent ZD's.

**Disclosure:**  
All listed authors had no relevant financial or non financial relationships in the products or services described, reviewed, evaluated or compared in this presentation.

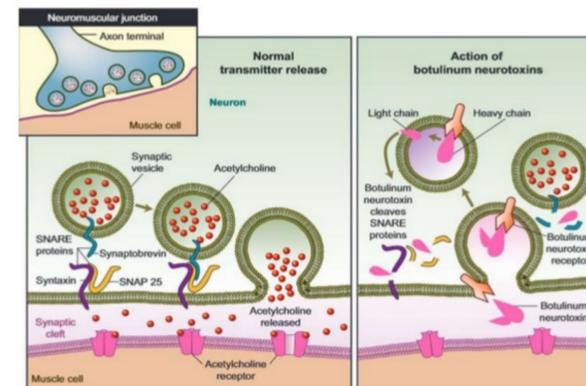
## Anatomy & Physiology

Zenker's Diverticulum results in herniation of the mucosal and submucosal tissue as intraluminal pressure increases in Killian's triangle, an area where the oblique fibers of the inferior pharyngeal constrictor muscle and horizontal fibers of the cricopharyngeal muscle converge. The lack of a muscular layer categorizes it as a false diverticulum. The anatomical location of the cervical esophagus is left of midline, thus ZD's are commonly found in the left neck.



## Botulinum Toxin

### ACTION OF BOTULINUM TOXIN



Clostridium botulinum toxin type A (Botox) is an injectable exotoxin that prevents the exocytosis of acetylcholine at the autonomic nervous system's cholinergic synapses, thus producing a reversible paralysis of striated muscles.

The first reported clinical indication for botulinum toxin was published in 1992 as a safe and effective treatment for glabellar frown lines with minimal adverse effects. The usage of Botox has since expanded to improve wound healing and conditions such as dystonia, muscle contractures, chronic migraines and bladder dysfunction.

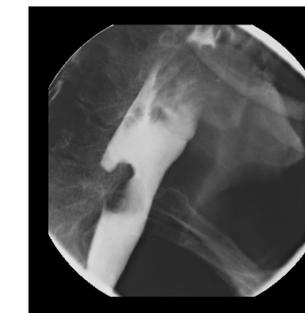
## Imaging

### Barium Swallow Studies:

#### Initial Presentation (September 2012):



#### First Recurrence (December 2013):



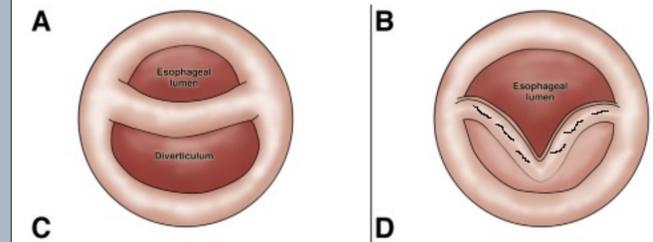
#### Second Recurrence (September 2015):



#### No Dysphagia, Normal Esophagram (May 2018):



## Staples Embedded in CP Muscle



Staples seen embedded in the cricopharyngeus muscle fibers during the final laser repair.

## Conclusions

While recurrent Zenker's diverticulum after open or endoscopic approach is often attributed to incomplete CP myotomy, there are some cases such as this in which despite full myotomy, the cut CP muscle re-grows leading to recurrent diverticulum formation. The addition of a chemodenervation agent to the cut muscle fibers decreases the chances of this occurring, immobilizing the myofibrils during the healing stages, allowing fibrosis and remucosalization to occur in the pharyngoesophageal party wall without re-development of a CP bar.

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