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Swallowed Nitroglycerin to Treat Esophageal Food Impaction

To the Editor:

Esophageal food impaction poses both management and length of stay challenges in the emergency department (ED). Patients presenting to an ED commonly have significant discomfort and distress. Widely used management options include intravenous glucagon, effervescent agents such as soda, or endoscopy. Other interventions that have been attempted include blind nasogastric tube insertion, papain enzyme, and systemic agents, including nitrates, calcium channel blockers, hyoscine butylbromide, papaverine, and diazepam.[1] Endoscopy requires specialized equipment and training that may not be readily available and is associated with risks inherent to both endoscopy and sedation. Swallowed nitroglycerin solution for esophageal food impaction was recently described in a single report, and we administered this therapy in 2 patients.

Patient 1 was a 12-year-old boy who had felt a piece of chicken sandwich become impacted 2.5 days before and was in significant discomfort, with dehydration. In the ED, he received nitroglycerin 0.4 mg dissolved in 10 mL tap water. This resulted in brief flushing and nausea, and within 1 minute he felt complete resolution of the food impaction. He acknowledged similar previous episodes that spontaneously resolved. Fluoroscopic upper gastrointestinal series result was normal, and diagnostic endoscopy was deferred.

Patient 2 was an 80-year-old man who felt a piece of turkey sandwich lodge in his esophagus several hours before presentation, causing pain and drooling. He had a history of esophageal stricture dilatation 15 years before and reported several months of intermittent dysphagia. Nitroglycerin 0.4 mg dissolved in 10 mL tap water was administered by swallowing, but there was no change in symptoms. Endoscopy showed a food bolus in the mid esophagus that entered the stomach on endoscopic insufflation. No stricture or esophagitis was present, and the cause may have been functional rather than anatomic.

Willenbring et al[2] in 2018 first reported on swallowed nitroglycerin for esophageal food impaction. Treatment was successful within 2 minutes in 2 patients aged 43 and 49 years. This unique therapy delivers nitroglycerin directly to the affected region of the esophagus, ideally inducing smooth muscle relaxation sufficient for resolution of the impaction.

We present these 2 cases for consideration of the potential benefit of this new therapy for esophageal food impaction. Use of nitroglycerin for pediatrics and esophageal food impaction is off label. Nitroglycerin will likely be well tolerated if it does not exceed a therapeutic dose used for angina, and can be considered before endoscopy if no contraindications are present. We found rapid resolution in one case and no benefit in a second case. This therapy warrants further study before routine implementation to determine efficacy, adverse effects, and appropriate dosing.

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Cornea Specialists Do Not Recommend Routine Usage of Topical Anesthetics for Corneal Abrasions

To the Editor:

As corneal specialists, we have noted an increasing number of patients with corneal abrasions who are being discharged from emergency departments (EDs) with topical anesthetics. This trend is concerning.

The corneal epithelium is the most densely innervated structure in the body, with an average number of terminal nerve endings greater than 600/mm^2.[1] Scratches on its surface, known as corneal abrasions, can be excruciatingly painful and even temporarily debilitating. Corneal abrasions often cause patients to seek emergency medical care.[2] To provide patients comfort during the diagnostic evaluation of these corneal injuries, emergency physicians and ophthalmologists often use topical anesthetic drops. However, recurrent use of these drops can delay wound healing, increase the risk of accidental trauma to the eye, promote infection, and even result in corneal perforation.

Even though a scratched cornea is painful, the sensation of pain is a functional evolutionary response. Pain is a required signal for corneal healing. Corneal sensation from the V1 branch of the trigeminal nerve triggers the blink reflex and tear production, which promotes lubrication and upregulates growth factor production.[3] Stimulation of corneal nerves initiates a healing cascade, which includes nerve growth factor, substance P, insulin-like growth factor 1, glial-cell-derived neurotrophic factor, and neurotrophins 3, 4, and 5, which are all involved in maintaining the corneal epithelium. All these important factors in wound healing are downregulated in the absence of corneal sensation.[4]

Neurotrophic, or anesthetized, eyes have delayed healing and are prone to complications of nonhealing epithelial corneal defects such as secondary infections and corneal melts (Figure 1). In the cornea clinic, some of the most difficult cases to treat are diseases that diminish or destroy corneal sensation, such as keratitis and ulcers from herpes zoster and herpes simplex virus type 1. The amount of corneal hypoesthesia is directly related to disease duration and the number of recurrences.[5] Not uncommonly, these conditions cause corneal melt, perforation, and permanent blindness.[6] In a worldwide survey of blindness, out of 285 million people who have poor vision, 2.85 million are visually impaired because of corneal opacities that are frequently related to corneal nerve dysfunction.[7]

The emergency medicine literature has published retrospective studies claiming the use of topical anesthesia is "safe and rated highly effective" for controlling pain.[8-11] In the largest retrospective study, which was published in *Annals*,[11] follow-up was short (24 hours) and the authors reported no difference in pain scores and "no serious complications or uncommon adverse events" between the groups who received topical tetracaine hydrochloride 1% drops and those who did not. However, after additional follow-up, the authors did report adverse effects. Of the 141 patients who received a diagnosis of a "nonsimple corneal abrasion," 2 patients eventually received a diagnosis of recurrent corneal erosions with significant decrease in vision, 2 patients had completely misdiagnosed disease and had severe anterior uveitis and episcleritis, and 1 patient with herpetic keratitis, a neurotrophic condition, was inappropriately prescribed tetracaine, with poor healing and a resultant visually significant corneal scar.

Often cited as the impetus and justification for the practice of prescribing topical anesthetic are 2 small studies investigating its use after photorefractive keratectomy surgery.[11,12] One such study clearly stated that it used anesthetic "in relation to defined wounds induced by specific surgical techniques" (ie, laser-created, geometric corneal injuries performed under surgically sterile conditions).[12] In contrast, corneal abrasions caused by foreign body trauma are not only nonsterile but also frequently dirty and are at higher risk for infection; it is therefore not appropriate to generalize these results for corneal abrasions.