

# PARALYSIS OF DEGLUTITION, A POST-POLIOMYELITIS COMPLICATION TREATED BY SECTION OF THE CRICOPHARYNGEUS MUSCLE\*

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IN THEIR ARTICLE on paralysis of deglutition, Naffziger, *et al.* describe the physiology of swallowing as follows: (a) mylohyoid and lingual muscles propel the food past the fauces; (b) contraction of the pharyngeal constrictor with elevation of the larynx; (c) involuntary stage by the circular fiber of the esophagus. The opening of the upper esophagus is accomplished by the rising of the larynx, and the larynx in turn is protected by the epiglottis assuming a horizontal position.<sup>1</sup>

The stylopharyngeus which is innervated by the motor branch of the ninth cranial nerve is the muscle which elevates the larynx. The pressure of the tongue on the epiglottis causes the latter to assume a horizontal position and to cover the larynx.

In the case described by the author, the patient was treated surgically by attaching the posterior belly of the digastric muscle to the larynx, thus compensating for the loss of the stylopharyngeus. In addition, the weakened pharyngeal constrictors were splinted with fascia to prevent their outward bulge.

As was noted by Max Peet<sup>2</sup> in his discussion of Naffziger's article, we often see cases with loss of stylopharyngeus function in which deglutition is not impaired. As for the importance of the epiglottis, I personally have removed epiglotti for cancer and

found no impairment in the function of swallowing. Negus,<sup>3</sup> in his excellent work on the larynx, regards the epiglottis as vestigial.

I must disagree with the contention that the raising of the larynx is the chief cause for the opening of the esophagus. Anyone who has done esophagoscopy is aware of the cricopharyngeus sphincter. This is a powerful muscle which acts in opposition to the pharyngeal constrictors; when they contract, the cricopharyngeus dilates.

With the above in mind, I treated a case of paralysis of deglutition resulting from bulbar poliomyelitis by sectioning the cricopharyngeus muscle. I would have also followed Dr. Naffziger's suggestion and attached the posterior belly of the digastric to the larynx, but unfortunately in my case, the facial nerve which innervates this part of the digastric was paralyzed.

## CASE REPORT

A. A., a white male, age 28, had an attack of bulbar poliomyelitis 18 months prior to admission. It was necessary at that time to do a tracheotomy for the purpose of aspirating the secretion from his tracheo-bronchial tree, since his ability to cough or swallow was impaired. A gastrostomy had also been performed at that time because of the deglutitory difficulty. At the time of admission he was wearing a No. 5 tracheotomy tube, corked up most of the time. He had to remove the obturator occasionally to clear his trachea. He also had a gastrostomy for feeding, as he was still unable to swallow anything. In addition to these findings, he showed a right lower facial paralysis. He was unable to adequately close the right eye, and saliva dribbled out of his mouth.

A neurologic survey disclosed that in addition to the swallowing paralysis and the facial

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paralysis of the right lower part of the face, he also had a ninth and a twelfth nerve involvement, all on the right side.

The patient was studied with the view of doing some procedure like the one described by Naffziger. However, because the seventh cranial nerve was involved, this plan was abandoned.

On July 27, 1949, under fluoroscopy, a barium swallow was tried out and spot films taken. The report made by Dr. Frank Isaac was as follows:



FIG. 1.—Roentgen ray of cervical region during swallowing of barium, showing arrest of bolus at cricopharynx.

The swallowing act was performed with some difficulty. The bolus hesitated in the hypopharynx in the region of the cricopharynx. The pyriform sinus on the left side emptied fairly well, but on the right side no movement was noted. Impression: weakness of muscles of deglutition with paralysis of the muscles of the right side.

In view of the fact that the bolus did get down to the cricopharynx and was slowed up

on the left side and stopped on the right side, it seemed likely that if the pinch cock effect of this muscle could be relieved, the bolus would go down into the esophagus by whatever muscle power the patient still had, plus gravity. He was therefore operated upon on October 14, 1949.

*Operation.* Under local anesthesia, 2% procaine infiltration, an incision was made in the lateral side of the neck from the upper rim of the thyroid cartilage to 5 mm. below the lower border of the cricoid on the right side. The soft tissues were separated and retracted until the fibers of the constrictor were exposed. These were separated off the thyroid cartilage and posteriorly off the pharyngeal mucosa, and then sectioned at right angles. The wound was then closed in layers.

*Progress.* On February 13, 1950, the patient reported to have his gastrostomy tube removed. He stated that he had not used it for several months. Although he still had some difficulty in swallowing, he was able to get food down so that he gained weight and felt well. A barium swallow fluoroscopy at this time showed difficulty in propelling the bolus to the hypopharynx, but it did not hesitate at the cricopharynx.

To overcome the dribbling resulting from the lower facial paralysis, a subcutaneous tantalum wire suspension of the sagging tissue was performed.

#### SUMMARY

A case of aphagia resulting from bulbar poliomyelitis was treated by section of the cricopharynx with sufficient improvement to discontinue gastrostomy feeding.

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