

Diagnosis and Treatment of Glossopharyngeal and Vagal Neuropathies in a Patient with Laryngopharyngeal Reflux

Irina Lokshina, M.D.,* Igor Feinstein, B.S.,† Carole Agin, M.D.,‡ Robert Katz, M.D.§

IN this case report, we describe the case of a patient with glossopharyngeal and vagal neuropathy masked by laryngopharyngeal reflux (LPR). LPR is a common disorder in persons older than 40 yr and is characterized by acid reflux into the upper esophagus and pharynx. Classic symptoms include mucus production, cough, wheezing, hoarseness, throat irritation, and globus sensation.¹⁻⁵ LPR is clinically differentiated from gastroesophageal reflux disease by the absence of heartburn and presence of prominent laryngopharyngeal symptoms, with laryngoscopy typically showing vocal cord edema and erythema.⁶ LPR is usually confirmed *via* pH studies demonstrating prolonged acidic pH in the upper esophagus and/or pharynx.^{2,7}

Vagal and/or glossopharyngeal neuropathies, however, are relatively rare conditions that may present together.⁸ Glossopharyngeal neuropathy is characterized by paroxysms of lancinating or burning pain in the oropharynx, whereas vagal neuropathy presents similarly but can also include symptoms of vocal cord dysfunction, such as hoarseness. Electromyography can be performed to confirm the diagnosis⁹ but is uncomfortable to the point of requiring deep sedation and is thus rarely done.

Both conditions share some symptoms with LPR, notably inspiratory stridor, hoarseness, and throat pain.¹⁰ In our case, the patient's neuropathy was first diagnosed at the chronic pain center and successfully treated with pregabalin almost a year after its onset.

Case Report

In December 2004, a 53-yr-old white man began experience a burning sore throat localized to the right side of the pharynx, with the pain radiating to his right ear. After treatment with cephalexin for 2 weeks resulted in no change in symptoms, indirect laryngoscopy revealed laryngeal erythema and edematous vocal cords, findings consistent

with LPR. After several months of treatment with proton pump inhibitors (esomeprazole and rabeprazole), the patient's sore throat became worse, and his symptoms began to include excessive mucus production, cough, and globus sensation.

In July 2005, a 24-h double pH probe (off medication for 1 week) demonstrated multiple episodes of acid reflux to the upper esophagus, confirming LPR. Proton pump inhibitor treatment was resumed and famotidine, an H₂ antagonist, was added, with the symptoms of cough and globus sensation gradually improving over the next few months, but with little or no decrease in pain. A computed tomography scan of the neck at this time was normal.

In December 2005, repeat pH testing, this time while taking medication, revealed the absence of acid in the esophagus, a finding consistent with a positive response to medication. Furthermore, repeat laryngoscopy showed resolution of vocal cord edema and laryngeal erythema, further suggesting resolution of LPR. At this time, the patient came to the chronic pain center as a result of his unremitting pain, which he characterized as spontaneous, burning/lancinating in nature, and radiating to the right ear. Physical examination revealed an absent right-sided gag reflex and decreased sensation to pinprick on the right side of the pharynx. The examination was otherwise unremarkable. A diagnosis of glossopharyngeal neuropathy was made based on these findings, and pregabalin was prescribed, starting at 50 mg once a day and gradually titrated up to 100 mg three times a day within a week. Because the sensory innervation of the pharynx is distributed between the 9th and 10th cranial nerves, the patient was referred to a laryngologist to evaluate for vagal neuropathy. Flexible endoscopic evaluation of swallowing with sensory testing (FEESST)¹¹ revealed severe sensory deficit. This, along with bowing and decreased abduction of the right vocal cord, confirmed a diagnosis of vagal neuropathy (fig. 1).

Over the course of 2 weeks after starting pregabalin, the patient's right-sided sore throat began to resolve and continued to improve for approximately 1 month. Before starting pregabalin therapy, the patient described his pain as 8 on a 10-point scale, whereas after a month of therapy, he described it as 1-2 out of 10.

Seven months after the onset of treatment with pregabalin, the patient began to report sporadic episodes of pain of a similar nature reaching up to 4 out of 10 in intensity. Viscous lidocaine (2%, 0.5 ml) was applied locally to the right tonsillar area, with the patient reporting a total relief of pain, with a pain score of 0 out of 10. The patient was then prescribed viscous lidocaine for self-application to be used in the treatment of breakthrough pain in addition to continued pregabalin therapy.

Discussion

Our patient's clinical symptoms were characteristic for the diagnosis of LPR, which was successfully diagnosed and treated. However, the patient's pain remained so severe that he was being considered to undergo Nissen fundoplication for treatment of LPR after all conservative measures by his otolaryngologists and lifestyle changes did not eliminate his pain. The patient was self-referred to the chronic pain center in a final effort to treat his pain before surgery. We diagnosed the patient's pain as

* Assistant Professor of Clinical Anesthesiology, † Medical Scientist Training Program Fellow, ‡ Associate Professor of Clinical Anesthesiology, § Professor of Clinical Anesthesiology, Department of Anesthesiology, Stony Brook University Medical Center.

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Address correspondence to Dr. Lokshina: Department of Anesthesiology, Health Sciences Center Level 4, Stony Brook University Medical Center, State University of New York at Stony Brook, Stony Brook, New York 11794. ilokshina@notes.cc.sunysb.edu. Information on purchasing reprints may be found at www.anesthesiology.org or on the masthead page at the beginning of this issue. ANESTHESIOLOGY's articles are made freely accessible to all readers, for personal use only, 6 months from the cover date of the issue.

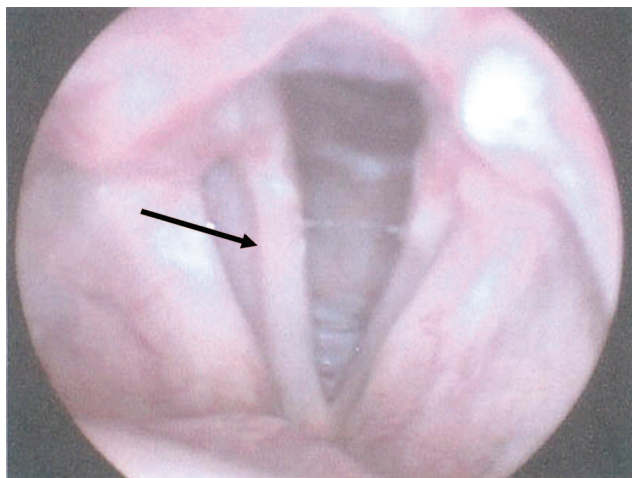


Fig. 1. Laryngoscopy performed by laryngologist after the start of treatment with pregabalin. Decreased abduction of the right vocal cord (arrow) is clearly visible.

glossopharyngeal and vagal neuropathy and as a separate issue from his LPR.

Our patient's complaint strongly suggested pain of neuropathic etiology. His symptoms of spontaneous paroxysmal burning pain in the tonsillar area that radiated to the right ear and did not resolve with previous treatment were strongly indicative of glossopharyngeal neuropathy. Our suspicion of neuropathy was confirmed on physical examination with absence of a gag reflex on the right and decreased sensation of pinprick on the right side of the pharynx. It is important to note, however, that glossopharyngeal neuropathy does not classically present with any physical findings, and a normal physical examination does not rule out this condition. Also, many patients with glossopharyngeal neuralgia present with pain that has a certain trigger, such as yawning or cold food,¹⁰ which our patient did not have. Our diagnosis was based primarily on the patient's history and pain description, with the physical examination only solidifying our initial impression.

Because there is a strong association of glossopharyngeal neuropathy with vagal neuropathy, our patient was referred for FEESST. FEESST is a relatively new procedure that is commonly used to evaluate dysphagia and aspiration and combines endoscopic evaluation of swallowing with sensory testing of the laryngopharynx.¹² It has been shown to be superior to other techniques at evaluating vocal cord motor function and laryngeal sensation but is limited by the fact that it does not evaluate the esophagus, where underlying pathology may cause a secondary laryngeal problem.¹¹ In our patient, FEESST revealed a severe sensory deficit and a motor deficit during abduction of the right vocal cord, which strongly suggested dysfunction of the right vagus nerve and further supported our diagnosis of pain of a neuropathic etiology.

Screening for neuropathic pain is extremely important because misdiagnosis may cause unnecessary diagnostic

and invasive procedures, increased patient suffering, and decreased quality of life. Had our patient not come to the pain center on his own, he might have undergone potentially unnecessary surgery with no guarantee that his pain would have resolved. Therefore, patients presenting with lancinating, burning, localized throat pain should be evaluated and treated for neuropathic pain if other possible causes have been ruled out. If vagal neuropathy is suspected, the patient should be referred for laryngoscopy to determine the presence of any vocal cord dysfunction. Although there are no reports of FEESST being used to evaluate specifically for vagal neuropathy, our case suggests that this may be a relevant application of this technique.

The cause of our patient's neuropathy is uncertain. However, a recent article postulates that the onset of LPR is caused by vagal neuropathy, which in turn is linked to upper respiratory infections, though this is unproven.¹³ Of note, our patient had several upper respiratory infections during the winter of 2004.

Although pregabalin, a recently introduced antiseizure medication, has been approved by the US Food and Drug Administration for treatment of diabetic neuropathy and postherpetic neuropathy, it has only once been reported to be effective in the treatment of glossopharyngeal neuropathy.¹⁴ Furthermore, to our knowledge, there has been no literature reporting the efficacy of pregabalin for the treatment of vagal neuropathy. In this case, the patient's previously severe pain was reduced to a tolerable level after only a month of therapy, with no noticeable side effects. Although it is plausible that our patient's pain could have responded to an older agent, such as gabapentin or a tricyclic antidepressant, pregabalin was chosen as a first-line agent because of its favorable side effect profile, ease and rapidity of titration, and lower effective dose.¹⁵⁻¹⁸ In fact, several recent studies recommend gabapentin, pregabalin, or a tricyclic antidepressant as equivalent first-line agents for treatment of neuropathic pain, with the ultimate choice being made depending on the individual case.^{19,20} In this case, pregabalin was chosen over a tricyclic antidepressant because of the significant antimuscarinic side effects associated with tricyclic antidepressant treatment, which pregabalin is relatively free of. Furthermore, because our patient had longstanding pain, pregabalin was the agent of choice to provide the quickest therapeutic effect because it achieves an effective dose much faster than gabapentin does.^{21,22} In addition, pregabalin improves patient compliance because its linear pharmacokinetics relieve the patient from complex dosing regimens during the titration period.²³ Interestingly, in tandem with its analgesic properties, pregabalin has been shown to contain antidepressive and anxiolytic properties, which are important in the treatment of patients with chronic pain.²⁴

In this case report, we discussed the use of pregabalin to effectively treat glossopharyngeal and vagal neuropathy

thy in a patient with LPR and stress the importance of screening patients with unexplained throat pain for pain of neuropathic etiology. Although some authorities have claimed that pregabalin may not be the ideal first-line agent of choice for treatment of neuropathic pain,²⁵ we believe that it is an effective treatment for vagal and/or glossopharyngeal neuropathy and should be of interest to the pain management physician.

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