Curious case of neck pain caused by glossopharyngeal neuralgia

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Differentiating the undifferentiated is a crucial but challenging task for family physicians. Despite our best efforts, our patients sometimes have "conditions not yet diagnosed" that leave them feeling hopeless. Glossopharyngeal neuralgia (GPN) is a rare condition thought to have an incidence rate of about 0.7 in 100,000 population per year,[1] representing roughly 0.2% to 1.3% of all facial pain syndromes.[2,3] Owing to its novelty and to lack of awareness of the condition, it is thought that the prevalence of GPN is likely underestimated.[4] The aim of this case review is to broaden the differential diagnoses for head and neck pain so that GPN can be better recognized in family physicians' offices for further evaluation and management.

Case

A 51-year-old woman of Asian descent with a known history of Crohn disease, bronchiectasis, and asthma presented with a 1-week history of left-sided neck pain in the context of an 8-year history of excruciating intermittent left-sided or right-sided neck pain that had not been properly diagnosed or treated. Her first pain episode occurred on the right side of her throat and neck, but since then either side could be affected. The pain episodes would recur once or twice a year, irrespective of the season. The pain was sharp and electric shock–like, usually lasting for several seconds. She rated the pain as 10 on a scale of 1 to 10, with 10 being the worst pain she had ever felt.

This time, the pain spanned from the back of the left throat to the left submandibular and carotid region. The pain usually lasted for less than a minute but recurred 80 to 100 times daily, and felt as "if someone was shoving a needle into [her] neck." The pain seemed to worsen with swallowing or talking and there were no alleviating factors. This neck pain was often accompanied by a globus sensation and a vague sense of discomfort in her left or right ear.

Her oral intake had been considerably reduced owing to the pain that came with eating. However, she denied any fever, night sweats, unintentional weight loss, syncope, nausea or vomiting, changes to bowel habits, dysphagia, regurgitation of solids or liquids, abdominal pain, or changes to her voice. She also denied any worsening of pain with salivation. In the past, these symptoms would resolve spontaneously after several months.

She had no additional comorbidities, and her only medications were an infliximab infusion every 4 weeks for her Crohn disease and a budesonide-formoterol inhaler for her asthma. She was a lifetime non-smoker and denied any alcohol or recreational drug use.

Her family history included a brother with a brain aneurysm but was otherwise unremarkable. Specifically, no other family members had experienced similar pain symptoms.

On physical examination, she was slim but otherwise appeared well. She was afebrile and all other vital signs including blood pressure were normal. Her pupils were 3 mm bilaterally and reactive. Findings of cranial nerve, motor, sensory, and cerebellar examinations were all normal, with no symptoms of cervical radiculopathy. She had full range of motion in her

Editor's key points

- Glossopharyngeal neuralgia is underdiagnosed and undertreated owing to a lack of awareness and understanding of the disease.
- It causes paroxysms of unilateral stabbing pain in the distribution of the glossopharyngeal nerve.
- Treatment options include membrane stabilizers such as carbamazepine and nerve block, and surgical interventions such as microvascular decompression and rhizotomy when medical treatments fail.
- The US Food and Drug Administration recommends screening for the HLA-B*15:02 allele in those patients at risk of developing fatal dermatologic reactions, such as those patients of Asian ancestry, before initiating carbamazepine.

Points de repère du rédacteur

- La névralgie du glossopharyngien est rarement diagnostiquée et peu traitée en raison d'un manque de connaissances et de compréhension de la maladie.
- Elle cause des paroxysmes de douleur lancinante et unilatérale dans larégion du nerf glossopharyngien.
- Parmi les options thérapeutiques, on peut mentionner des stabilisateurs de la membrane comme la carbamazépine et un bloc nerveux, et, si les traitements médicaux échouent, des interventions chirurgicales comme la décompression microvasculaire et la rhizotomie.
- La Food and Drug Administration des États-Unis recommande de procéder à un dépistage de l'allèle HLA-B*15:02 chez les patients à risque de développer des réactions dermatologiques fatales, notamment les patients d'origine asiatique, avant d'administrer la carbamazépine.

neck and denied any pain with movements or midline tenderness. Findings of her ear and throat examinations were unremarkable other than that she seemed hesitant to open her mouth, as doing so could trigger her pain. Specifically, her dentition was good, with no dental pain, and there was no pharyngeal erythema or swelling. The uvula was midline and nonedematous. There was an appropriate and symmetrical elevation of the uvula and palate with phonation. However, the patient felt discomfort with continuous wide mouth opening, so sensation of the tongue and gag reflex were not assessed. I palpated along the outside of her head and neck but could not trigger any pain. There was no obvious mass in the head or neck region. There was no tenderness over the temporomandibular joint. In addition, I did not perceive any carotid bruit and findings of the rest of her cardiovascular, respiratory, and abdominal examinations were normal.

A repeat ultrasound scan of her neck and a carotid Doppler ultrasound scan were arranged. I also asked her gastroenterologist to consider gastroscopy at the time of the patient's next colonoscopy. Findings of the repeat neck ultrasound scan, carotid Doppler ultrasound scan, and gastroscopy were all unremarkable. **Box 1** lists other investigations done to determine the cause of the patient's pain.

Discussion

I was perplexed by the patient's unusual presentation and normal investigation findings. Several days later I serendipitously came across a paragraph from the textbook *Tintinalli's Emergency Medicine*.[5] It read: "*Trigeminal neuralgia* is the most common of the craniofacial neuralgias. Other significantly less common neuralgias of the craniofacial region include *glossopharyngeal neuralgia*."[5] UpToDate also explained: "Glossopharyngeal neuralgia is characterized by paroxysmal, severe, stabbing pain involving the ear, tonsillar fossa, base of the tongue, or beneath the angle of the jaw."[6]

I called the patient immediately to inform her of the condition. Given that carbamazepine was considered the first-line agent for GPN,[7] genetic testing for the HLA-B*15:02 allele was ordered as HLA-B*15:02 has a high prevalence in many Asian populations and has been associated with an increased risk of carbamazepine-induced Stevens-Johnson syndrome and toxic epidermal necrolysis.[8] Once the screening results negative for HLA-B*15:02 were obtained, she was started on 100 mg of oral carbamazepine twice a day and was referred to a neurologist.

The patient's symptoms completely resolved within the first 24 hours of initiating carbamazepine. The patient was later formally diagnosed with GPN by a neurologist. The patient stopped taking the 100 mg of twice-daily oral carbamazepine after 2.5 weeks of treatment, as her symptoms had completely resolved. She remained symptom free until the GPN recurred after 8 months. During this most recent episode, she took up to 700 mg of carbamazepine per day. The patient was taking her medication as needed because she experienced abdominal discomfort and daytime grogginess, especially with higher doses. This episode of GPN completely resolved after several months. The patient now takes 100 mg of oral carbamazepine as needed as soon as she feels mild discomfort developing in the affected areas. She uses the as-needed doses roughly 3 times a week and they help to prevent further pain attacks.

Glossopharyngeal neuralgia is a relatively rare condition, and although population data are sparse owing to the rarity of the cases, a retrospective study of the population of Rochester, Minn, suggested that roughly 25% of the affected patients had bilateral symptoms and only 3.6% of the patients had a second annual recurrence.[1,9] While a study by Katusic et al concluded that the disease seemed to be more common in men than women and that GPN is more common on the left side than on the right,[1] an examination of 217 patients by Patel et al revealed a female predominance with a nearly equal left- and right-side presentation.[10] Glossopharyngeal neuralgia is mostly a disease of adults, with a predilection for patients older than 50 years.[10-12]

Although most cases of GPN are thought to be idiopathic, in some cases compression of the nerve by a blood vessel (most commonly the posterior inferior cerebellar artery) has been shown to play a role.[3,13,14] Other possible secondary causes of GPN include compression of the nerve by intracranial lesions such as cerebellopontine angle tumour,[15] elongated styloid process (Eagle syndrome),[16] inflammation or scarring of the oropharynx,[17,18] and abnormalities of the cranial base such as Paget disease.[19] To rule out secondary causes of the patient's symptoms, I arranged for unenhanced brain magnetic resonance imaging with thin slices through the brainstem as per radiologist recommendation. A cause for the patient's symptoms was not identified with further imaging.

The *International Classification of Headache Disorders, 3rd Edition,* defines GPN as a disorder characterized by

Box 1. Summary of the patient's past investigations

The following are investigations done to determine the cause of the patient's pain; all findings were normal.

- Complete blood count with differential, blood chemistry, and C-reactive protein level
- Barium swallow
- Ultrasound scan of the neck
- Ultrasound scan of the thyroid
- Computed tomography scan of the soft tissue of the neck
- *Helicobacter pylori* testing
- Otolaryngology assessment or laryngoscopy
- Magnetic resonance imaging of the head for aneurysm screening

paroxysm of unilateral stabbing pain in the distribution of the glossopharyngeal nerve, as well as the auricular and pharyngeal branches of the vagus nerve.[20] Its diagnostic criteria are presented in **Table 1**.[20]

In many cases, neurologic examination findings, as well as findings of a comprehensive examination of the head and neck, tend to be normal. Findings on imaging studies, such as computed tomography and magnetic resonance imaging, could also be within the normal range.[12] However, pain might be elicited by stimulating the trigger points in the distribution of the nerve, and radiographic studies could reveal potential secondary causes of GPN. Laboratory tests, such as inflammation markers, serum chemistry, and complete blood count, could help rule out infectious or inflammatory causes of patient symptoms.[21]

About 10% of patients can experience severe complications of GPN including arrythmia, asystole, syncope, seizure, and even cardiac arrest, requiring major interventions such as pacemaker insertion.[18,22-24]

Membrane stabilizers, such as carbamazepine and gabapentin, are considered first-line agents.[13] Combination therapy using both oral medication and glossopharyngeal nerve block can also be considered.[25] Surgical treatments, such as microvascular decompression and rhizotomy, are recommended when medical treatment is not tolerable or efficacious.[26-28]

Conclusion

Glossopharyngeal neuralgia is a rare facial pain syndrome that can be easily missed. As family physicians, we can play an important role in recognizing this rare but debilitating condition and directing patients to a neurologist for further assessment and treatment. Given its rarity, I strongly recommend further neurologist referral to confirm the diagnosis. If all diagnostic criteria are met, and other possible causes of patient symptoms have been excluded, I believe it reasonable to offer a trial of low-dose carbamazepine to a patient while waiting for a neurologist referral. The nature of pharmacotherapy, risks, benefits, and alternatives should be fully discussed with the patient. Timely and accurate diagnosis of this condition can substantially improve patient symptoms and function. It is thought that the frequency of GPN is likely underestimated owing to the lack of awareness of this condition.[4] Increased understanding and knowledge about this disease will enhance the care of those patients who might still be suffering from this condition without a tangible diagnosis.

Table 1. ICHD-3 diagnostic criteria for glossopharyngeal neuralgia

CRITERION	DESCRIPTION
A	Recurring paroxysmal attacks of unilateral pain in the distribution of the glossopharyngeal nerve (ie, within the posterior part of the tongue, tonsillar fossa, pharynx, or angle of the lower jaw or in the ear) and fulfilling criterion B
B	Pain has all of the following characteristics: 1. lasting from a few seconds to 2 min, 2. severe intensity, 3. electric shock–like, shooting, stabbing, or sharp in quality, and 4. precipitated by swallowing, coughing, talking, or yawning
C	Not better accounted for by another ICHD-3 diagnosis

ICHD-3—*International Classification of Headache Disorders, 3rd Edition*. Reproduced with permission from the International Headache Society.[20]

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Competing interests
None declared

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References

1. Katusic S, Williams DB, Beard CM, Bergstralh E, Kurland LT. Incidence and clinical features of glossopharyngeal neuralgia, Rochester, Minnesota, 1945-1984. *Neuroepidemiology* 1991;10(5-6):266-75.
2. Chawla JC, Falconer MA. Glossopharyngeal and vagal neuralgia. *Br Med J* 1967;3(5564):529-31.
3. Chen J, Sindou M. Vago-glossopharyngeal neuralgia: a literature review of neurosurgical experience. *Acta Neurochir* (Wien) 2015;157(2):311-21. Epub 2014 Dec 21.
4. Gaul C, Hastreiter P, Duncker A, Naraghi R. Diagnosis and neurosurgical treatment of glossopharyngeal neuralgia: clinical findings and 3-D visualization of neurovascular compression in 19 consecutive patients. *J Headache Pain* 2011;12(5):527-34. Epub 2011 May 13.
5. Beaudreau RW. Oral and dental emergencies. In: Tintinalli JE, Stapczynski JS, Ma OJ, Yealy DM, Meckler GD, Cline DM, editors. *Tintinalli's emergency medicine: a comprehensive study guide*. 8th ed. New York, NY: McGraw-Hill Education; 2016. p. 1602.
6. Ho CC, Khan SA, Garza I. *Overview of craniofacial pain*. Waltham, MA: UpToDate; 2021. Available from: **https://www.uptodate.com/contents/overview-of-craniofacial-pain?search=overview%20of%20craniofacial%20pain&source=search_result&selectedTitle=1~150&usage_type=default&display_rank=1**. Accessed 2021 Nov 24.
7. Wiffen PJ, Derry S, Moore RA, Kalso EA. Carbamazepine for chronic neuropathic pain and fibromyalgia in adults. *Cochrane Database Syst Rev* 2014;(4):CD005451.
8. Ferrell PB Jr, McLeod HL. Carbamazepine, HLA-B*1502 and risk of Stevens-Johnson syndrome and toxic epidermal necrolysis: US FDA recommendations. *Pharmacogenomics* 2008;9(10):1543-6.
9. Katusic S, Williams DB, Beard CM, Bergstralh EJ, Kurland LT. Epidemiology and clinical features of idiopathic trigeminal neuralgia and glossopharyngeal neuralgia: similarities and differences, Rochester, Minnesota, 1945-1984. *Neuroepidemiology* 1991;10(5-6):276-81.
10. Patel A, Kassam A, Horowitz M, Chang YF. Microvascular decompression in the management of glossopharyngeal neuralgia: analysis of 217 cases. *Neurosurgery* 2002;50(4):705-10.
11. Rozen TD. Trigeminal neuralgia and glossopharyngeal neuralgia. *Neurol Clin* 2004;22(1):185-206.
12. Blumenfeld A, Nikolskaya G. Glossopharyngeal neuralgia. *Curr Pain Headache Rep* 2013;17(7):343.
13. Graff-Radford SB, Newman A, Ananda A. Treatment options for glossopharyngeal neuralgia. *Therapy* 2005;2(5):733-7.
14. Amthor KF, Eide PK. Glossopharyngeusnevralgi [Glossopharyngeal neuralgia]. *Tidsskr Nor Laegeforen* 2003;123(23):3381-3.
15. Weisenburg TH. Cerebello-pontine tumor diagnosed for six years as tic douloureux: the symptoms of irritation of the ninth and twelfth cranial nerves. *JAMA* 1910;54(20):1600-4.
16. Kawasaki M, Hatashima S, Matsuda T. Non-surgical therapy for bilateral glossopharyngeal neuralgia caused by Eagle's syndrome, diagnosed by three-dimensional computed tomography: a case report. *J Anesth* 2012;26(6):918-21. Epub 2012 Jul 4.
17. Kim E, Do W, Jung YH, Lee J, Baik J. Gradual aggravation of idiopathic glossopharyngeal neuralgia due to chronic tonsillitis: a case report. *Medicine* (Baltimore) 2019;98(17):e15234.
18. Fischer L, Ludin SM, Puente de la Vega K, Sturzenegger M. Neuralgia of the glossopharyngeal nerve in a patient with posttonsillectomy scarring: recovery after local infiltration of procaine—case report and pathophysiologic discussion. *Case Rep Neurol Med* 2015;2015:560546. Epub 2015 Apr 16.
19. Orton CI. Glossopharyngeal neuralgia. Its diagnosis and treatment. *Br J Oral Surg* 1972;9(3):228-32.
20. Headache Classification Committee of the International Headache Society. The International Classification of Headache Disorders, 3rd edition. *Cephalalgia* 2018;38(1):1-211.
21. Khan M, Nishi SE, Hassan SN, Islam MA, Gan SH. Trigeminal neuralgia, glossopharyngeal neuralgia, and myofascial pain dysfunction syndrome: an update. *Pain Res Manag* 2017;2017:7438326. Epub 2017 Jul 30.

22. Kong Y, Heyman A, Entman ML, McIntosh HD. Glossopharyngeal neuralgia associated with bradycardia, syncope, and seizures. *Circulation* 1964;30:109-13.
23. Krasoudakis A, Anyfantakis D, Hadjipetrou A, Kastanakis M, Symvoulakis EK, Marathianos S. Glossopharyngeal neuralgia associated with cardiac syncope: two case reports and literature review. *Int J Surg Case Rep* 2015;12:4-6. Epub 2015 May 7.
24. Johnston RT, Redding VJ. Glossopharyngeal neuralgia associated with cardiac syncope: long term treatment with permanent pacing and carbamazepine. *Br Heart J* 1990;64(6):403-5.
25. Singh PM, Dehran M, Mohan VK, Trikha A, Kaur M. Analgesic efficacy and safety of medical therapy alone vs combined medical therapy and extraoral glossopharyngeal nerve block in glossopharyngeal neuralgia. *Pain Med* 2013;14(1):93-102. Epub 2012 Dec 28.
26. Rey-Dios R, Cohen-Gadol AA. Current neurosurgical management of glossopharyngeal neuralgia and technical nuances for microvascular decompression surgery. *Neurosurg Focus* 2013;34(3):E8.
27. Kim MK, Park JS, Ahn YH. Microvascular decompression for glossopharyngeal neuralgia: clinical analyses of 30 cases. *J Korean Neurosurg Soc* 2017;60(6):738-48. Epub 2017 Oct 25.
28. Den Hartog AW, Jansen E, Kal JE, Duyndam D, Visser J, van den Munckhof P, et al. Recurrent syncope due to glossopharyngeal neuralgia. *HeartRhythm Case Rep* 2016;3(1):73-7.

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