Schwannoma of the tongue: a case report with review of literature

Eun-Young Lee*, Jae-Jin Kim, Hyun Seok and Ja-Youn Lee

Abstract

**Background:** Schwannomas (or neurilemmomas) of the tongue are benign, usually solitary, encapsulated masses derived from Schwann cells. Clinical evidence indicates that schwannoma is painless and slow growing. In general, schwannoma is treated by surgical excision.

Here, we describe a case of schwannoma of the tongue, include a review of the literature from 1955 to 2016, and provide data on age, gender, location, presenting symptoms, size, and treatment methods.

**Case presentation:** A 71-year-old female patient presented with a swelling at the base of the tongue of unknown duration. Magnetic resonance images (MRI) showed a large well-circumscribed solid mass and no significant lymph node enlargement. The mass was excised without removing overlying mucosa.

**Conclusions:** The authors report a case of lingual schwannoma that was completely removed intraorally without preoperative biopsy. No sign or symptoms of recurrence were observed at 12 months postoperatively.

**Keywords:** Schwannoma, Neurilemmoma, Tongue

**Background**

Around 25–40% of schwannomas occur in the head and neck region, and of these, 1–12% affect the intraoral area [1], most frequently the tongue or mouth floor [2]. Because of their rarity, intraoral schwannomas are not generally part of the differential diagnosis of tongue mass which includes squamous cell carcinoma, sarcoma, granular cell tumor, salivary gland tumor, schwannoma, leiomyoma, rhabdomyoma, hemangioma, lipoma, lymphangioma, dermoid cysts, and inflammatory lesions [3].

Clinically, schwannomas are benign, usually solitary, encapsulated masses that originate from Schwann cells without pain or ulceration.

Here, we report a case of schwannoma of the tongue base and review the literature. A Google search of the terms “schwannoma (neurilemmoma) of the tongue” and “lingual Schwannoma” was performed from 1955 to 2016. Age, gender, location (anterior, posterior, base, ventral), presenting symptoms, size, and treatment methods were extracted from case reports.

**Case presentation**

A 71-year-old female patient presented with a firm swelling at the base of her tongue of unknown duration that had progressively increased in size. Her only symptom was distortion of the tongue. Medical history taking revealed controlled hypertension (duration X years) and thyroid grand tumor. A well-encapsulated nodular mass was evident at physical examination, but without any neurologic symptom or lymphadenopathy in the submandibular area. The mass was 3 × 2 cm sized without ulceration (Fig. 1). Magnetic resonance imaging (MRI) depicted a solid, soft, heterogeneously enhanced lesion (Figs. 2 and 3). Complete surgical excision was conducted under general anesthesia without preoperative biopsy. Blunt dissection was performed without rupturing the mass or causing dehiscence of superficial mucosa. The mass was completely excised under mucosa (Fig. 4). It had been infiltrated by a branch of the lingual nerve, and a portion of the nerve had to be removed to achieve complete resection. On gross examination, the mass was grayish-yellow and well encapsulated with exophytic lobules (Fig. 5). Microscopically, the lesion was characterized by a mixture of Antoni type A and B tissue growth.
patterns with hyalinized vessel walls (Fig. 6). No sign or symptoms of recurrence were detected 12 months after surgery (Fig. 7).

A review of the literature over the past 61 years that showed 84 cases, including the present case, has been reported (Table 1). Lingual schwannoma may arise at any age between 7 and 77 and shows no sex predilection (44 males and 40 females) [4, 5]. Despite the fact that it originates from nerve tissue, lingual schwannoma is usually painless.

In 51 cases, the only presenting symptom was an enlarging lump. Other symptoms were dysphagia (15 cases), pain (or discomfort, 10 cases), dysphonia (6 cases), voice change (5 cases), paresthesia (3 cases), snoring (2 cases), bleeding (2 cases), ulceration (2 cases), and abscess (1 case). Masses were located in any part of the tongue. Average size at removal was 2.4 cm (range, 0.3–8.5 cm), and all were treated by transoral excision except 3 cases. The submandibular approach was used in 2 cases and lip splint and mandibullectomy in 1 case. In all three of these cases, masses were located in posterolateral bases.

Discussion

Although the etiology of schwannoma is not clear, it is known to be derived from nerve sheath Schwann cells, which surround cranial, peripheral, and autonomic nerves [6, 7]. The head and neck are rather common location of this neoplasm. Intraoral schwannomas mainly arise from the tongue, followed by the palate, mouth floor, buccal mucosa, gingiva, lip, and vestibule [8, 9], though the tongue is most commonly involved [10]. The lesion is slow growing, and thus, its onset is usually long before presentation. Lingual schwannoma shows no age or gender predisposition [11]. Usually, it is presented as a painless lump in any part of the tongue of average size 2.4 cm. However, when the mass exceeds 3.0 cm, dysphagia, pain (or discomfort), dysphonia, and voice change are usually presented (Table 1).
Computed tomography (CT) usually shows well-defined homologous lesions. When a heterogeneous lesion is observed by CT, malignant change may be suspected [12]. However, MRI is superior to CT at depicting lingual schwannoma, as it is not degraded by dental artifacts that plague CT in the intraoral area. Lesion signals are isointense versus muscle on T1-weighted images, but hyperintense on T2-weighted images [13]. MRI also allows mass size to be accurately measured and mass localization in relation to other structures. Characteristically, these tumors usually appear to be smooth and well demarcated and do not invade the surrounding structures.

In our case, MRI ruled out the possibility of malignancy and invasion. Enoz et al. [14] reported a malignant transformation rate for head and neck schwannoma of 8–10%. In general, schwannoma does not undergo malignant transformation [15, 16]. However, several cases of malignant transformation of head and neck schwannomas have been reported, although only one involved the tongue [17]. One malignant transformation was evident in our patient.

Histologically, all schwannomas are encapsulated, and beneath capsules, two main patterns are observed, that is, Antoni type A, which is highly cellular and is composed of elongated Schwann cells, which exhibit a palisading nuclear pattern, and Antoni type B, which is also composed of elongated Schwann cells, but cells are arranged in a less dense myxoid manner and are more disorganized than Antoni type A (Fig. 6).

Schwannomas are usually treated by surgical excision with involved originating nerve [18]. In the literature, transoral excision is the most common approach used (Table 1), although some other approaches have been reported to produce success results, such as the submandibular, which is adopted to address lingual schwannoma of the posterolateral base. More recently, CO2 laser excision has also been used to treat base of tongue Schwannomas [5, 17]. On the other hand, if a mass is located at the posterolateral base, is inaccessible via the mouth, and has a size >4.0 cm, open techniques, such as the submandibular or lip split approach, are used [2, 4, 19]. Schwannomas are not responsive to radiotherapy [9], and incomplete surgical excision may result in recurrence, although recurrence is uncommon after complete surgical excision [20]. Because masses are encapsulated, their complete removal is straightforward. In our patient, overlying mucosa was preserved to minimize postoperative complications and promote rapid healing without inflammation, and during follow-up, she reported little inconvenience.

Conclusions
Lingual schwannoma is a relatively rare tumor of the head and neck and may occur anywhere in the tongue. At presentation, the majority of patients complain an asymptomatic mass and slight ulceration. Transoral resection preserving overlying mucosa allowed us to remove the tumor in a manner that precluded recurrence and prevented tongue dysfunction.
| Author                      | Year | Gender | Age | Size (cm) | Site      | Presentation                                | Surgical approach |
|-----------------------------|------|--------|-----|-----------|-----------|---------------------------------------------|-------------------|
| Mercantini and Mopper [21]  | 1959 | M      | 22  | 1         | Anterior  | Intermitten pain                            | Transoral         |
| Cameron [22]                | 1959 | M      | 25  | 1.5       | Anterior  | Lump                                        | Transoral         |
| Chadwick [23]               | 1964 | F      | 20  | 2.2       | Posterior | Lump                                        | Transoral         |
| Craig [24]                  | 1964 | F      | 8   | 3         | Posterior | Lump                                        | Transoral         |
| Pantazopoulos [25]          | 1965 | M      | 25  | 1         | Anterior  | Intermitten pain                            | Transoral         |
| Oles and Werthemier [29]    | 1967 | F      | 28  | 3         | Anterior  | Lump                                        | Transoral         |
| Palwal et al. [30]          | 1967 | M      | 32  | 2.5       | Anterior  | Lump                                        | Transoral         |
| Crawford et al. [31]        | 1968 | M      | 23  | 0.5       | Anterior  | Lump                                        | Transoral         |
| Das Gupta et al. [32]       | 1969 | F      | 21  | 5         | Posterior | Pain                                         | Transoral         |
| Bitici [33]                 | 1969 | M      | 40  | 2.5       | Anterior  | Slight discomfort                           | Transoral         |
| Sinha and Samuel [34]       | 1971 | M      | 23  | 1.5       | Posterior | Dysphagia                                   | Transoral         |
| Mosadomi [35]               | 1975 | M      | 19  | 3         | Anterior  | Painful mass                                | Transoral         |
| Wassilipa et al. [36]       | 1976 | M      | 26  | 3         | Anterior  | Lump                                        | Transoral         |
| Sharan and Akhtar [37]      | 1978 | F      | 30  | 1.5       | Anterior  | Change in voice                             | Transoral         |
| Akimoto et al. [38]         | 1987 | M      | 15  | 1         | Anterior  | Lump                                        | Transoral         |
| Sira et al. [39]            | 1988 | F      | 18  | 3         | Posterior | Lump                                        | Transoral         |
| Flickinger et al. [40]      | 1989 | F      | 28  | 3         | Anterior  | Lump                                        | Transoral         |
| Talmi et al. [41]           | 1991 | F      | 75  | 1         | Posterior | Lump                                        | Transoral         |
| Galliesio and Berrone [42]  | 1992 | F      | 21  | 1.9       | Anterior/base | Dysphonia/paresthesia/chewing difficulty | Transoral         |
| Lopez and Bailislin [10]    | 1993 | M      | 24  | 0.6       | Anterior  | Lump                                        | Transoral         |
| Haring [43]                 | 1994 | F      | 49  | 2         | Anterior  | Lump                                        | Transoral         |
| Nakayama et al. [44]        | 1996 | F      | 40  | 5.5       | Anterior  | Lump                                        | Transoral         |
| Dreher et al. [15]          | 1997 | F      | 31  | 3         | Base      | Dysphagia                                   | Transoral         |
| Spandow et al. [45]         | 1999 | M      | 37  | 7.9       | Posterior | Throat discomfort                           | Transoral         |
| de Bree et al. [2]          | 2000 | F      | 24  | 5         | Posterolateral/base | Lump         | Submandibular     |
| Pfeifle et al. [46]         | 2001 | F      | 30  | 0.3       | Anterior  | Lump                                        | Transoral         |
|                             | 2001 | M      | 18  | 2         | Anterior  | Lump                                        | Transoral         |
| Reference                  | Year | Gender | Age  | Presenting Symptom          | Location      | Treatment  |
|----------------------------|------|--------|------|----------------------------|---------------|------------|
| Cinar et al. [47]          | 2004 | M      | 7    | l | Anterior Lump Transoral    |               |            |
| Bassichis and McMlay [48]  | 2004 | M      | 9    | 2.3 | Posterior/base Snoring     | Transoral     |            |
| Nakasato et al. [49]       | 2005 | F      | 9    | 2 | Posterolateral/base Bleeding/ulceration | Transoral     |            |
| Hwang et al. [50]          | 2005 | M      | 23   | 2.8 | Anterior Lump Transoral    | Transoral     |            |
| Lopez-Jornet and Bermejo-Fenoll [51] | 2005 | M      | 39   | 0.8 | Posterolateral/base Lump Transoral |            |
| Vafiadis et al. [52]       | 2005 | M      | 18   | 3.1 | Anterior Lump Transoral    | Transoral     |            |
| Bansal et al. [53]         | 2005 | M      | 26   | 4  | Posterolateral/ventral Paresthesia/dysphonia | Transoral     |            |
| Hsu et al. [7]             | 2006 | M      | 20   | 5  | Posterior/base Bleeding     | Transoral     |            |
|                           | 2006 | F      | 32   | 1.8 | Posterolateral/base Lump Transoral |            |
|                           | 2006 | M      | 38   | 3  | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | M      | 45   | 0.5 | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | M      | 25   | 0.9 | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | F      | 39   | 1  | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | M      | 9    | 1.2 | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | F      | 15   | 1.2 | Anterior Lump Transoral    | Transoral     |            |
|                           | 2006 | F      | 12   | 1.6 | Anterior Lump Transoral    | Transoral     |            |
| Ying et al. [54]           | 2006 | F      | 26   | 4  | Posterolateral/base Dysphagia/otalgia | Transoral     |            |
| Enoz et al. [14]           | 2006 | M      | 7    | 2.5 | Anterior/base Dysphagia/pain | Transoral     |            |
| Mehrzad et al. [55]        | 2006 | M      | 49   | 2.2 | Posterolateral/base Pain Transoral |            |
| Batra et al. [56]          | 2007 | M      | 30   | 3  | Posterolateral/base Dysphagia, dyspnea, abscess Transoral |            |
|                           | 2007 | M      | 33   | 3  | Posterolateral/base Dysphonia Transoral |            |
| Ballesteros et al. [57]    | 2007 | F      | 31   | 2  | Base Pain CO2-transoral    | Transoral     |            |
| Sawhney et al. [19]        | 2008 | F      | 37   | 4.6 | Posterolateral/base Dysphagia/snoring Submandibular | Transoral     |            |
| Sethi et al. [58]          | 2008 | F      | 28   | 1  | Anterolateral/ventral Lump Transoral |            |
| Pereira et al. [59]        | 2008 | M      | 12   | 1.5 | Posterolateral/ventral Lump Transoral |            |
| Cohen and Wang [17]        | 2009 | M      | 77   | 0.7 | Posterolateral/ventral Lump Transoral |            |
|                           | 2009 | F      | 19   | 1.8 | Posterolateral/ventral Lump Transoral |            |
| Gupta et al. [60]          | 2009 | F      | 18   | 1  | Anterior/ventral Lump Transoral |            |
| Mardanpour and Rahbar [61] | 2010 | M      | 18   | 2  | Posterior Dysphagia/change of voice Transoral |            |
| Karaca et al. [62]         | 2010 | F      | 13   | 2  | Posterolateral/ventral Dysphagia Transoral |            |
| Cigdem et al. [63]         | 2010 | M      | 13   | 2  | Anterior/ventral Lump Transoral |            |
| Jeffcoat et al. [64]       | 2010 | M      | 68   | 1.5 | Lateral Lump Transoral     |            |
| Study                        | Year | Gender | Age (y) | Location         | Symptoms                                | Procedure |
|------------------------------|------|--------|---------|------------------|-----------------------------------------|-----------|
| Naidu and Sinha [65]         | 2010 | M      | 12      | Anterolateral/base | Paresthesia/bleeding/ulceration         | Transoral |
| Lukšić et al. [66]           | 2011 | M      | 10      | Posterior/ventral | Lump                                    | Transoral |
| Batra et al. [67]             | 2011 | F      | 38      | Anterolateral/base | Paresthesia                             | Transoral |
| Nisa et al. [68]              | 2011 | F      | 38      | Posterior/ventral | Dysphagia/change of voice              | Transoral |
| Monga et al. [69]             | 2013 | M      | 20      | Posterior/ventral | Dysphagia/dysphonia/dyspnea             | Transoral |
| Lira et al. [5]               | 2013 | F      | 26      | Posterior/ventral | Cervical pain                           | Transoral |
| Erkul et al. [70]             | 2013 | M      | 21      | Posterior/ventral | Chewing difficulty                      | Transoral |
| Jayaraman et al. [71]         | 2013 | M      | 21      | Anterolateral/ventral/tip | Lump                                 | Transoral |
| George et al. [4]             | 2014 | M      | 26      | Posterolateral/base | Dysphagia/dysphonia                     | Transoral |
| Bhola et al. [11]             | 2014 | F      | 14      | Anterolateral/ventral | Lump                                 | Transoral |
| Moreno-García et al. [16]     | 2014 | F      | 13      | Anterior/ventral | Lip split/mandibulotomy                  | Transoral |
| Nibhoria et al. [72]          | 2015 | F      | 18      | Posterior/ventral | Lump                                    | Transoral |
| Gopalakrishnan et al. [73]    | 2016 | M      | 32      | Posterolateral/ventral | Dysphagia                             | Transoral |
| Sharma and Rai [74]           | 2016 | F      | 20      | Posterolateral/ventral | Dysphagia/dysphonia                 | Transoral |
| Kavčič and Božič [75]         | 2016 | F      | 20      | Anterolateral/ventral/tip | Lump                                | Transoral |
| Lee et al. [76]               | 2016 | M      | 28      | Posterior/ventral | Lump                                    | Transoral |
| Lee                          |      |        |         |                  | Anterior/base                           | Transoral |

*MRI: magnetic resonance images, CT: computed tomography*
56. Batra K, Rai A, Chaudhary N, Topno S (2007) Two cases of neurilemmoma of the tongue. ENT- Ear Nose Throat J 86:679–681
57. Ballesteros F, Villaseca I, Blanch J, Gaspa A, Bernal-Sprekelsen M (2007) Base of tongue neurilemmoma: excision by transoral laser microsurgery. Acta Otolaryngol 127:1005–1007
58. Seth D, Sethi A, Nigam S, Agarwal A (2008) Schwannoma of oral tongue: a rare benign neoplasm. IHANS Vol. 3, No. 1. 8496
59. Pereira L, Pereira P, dos Santos JP, Reis Filho V, Dominguey PR, Pereira AA (2008) Lingual schwannoma involving the posterior lateral border of the tongue in a young individual: case report. J Clin Pediatr Dent 33:59–62
60. Gupta P, Garg A, Dhirng A, Jain D, Kohli K, Khurana N (2009) Schwannoma tongue: a rare entity. ANZ J Surg 79:93–94
61. Mardanpouri K, Rahbar M (2009) Lingual schwannoma: a case report. IRJCM 11:454–456
62. Karaca C, Habesoglu T, Naiboglu B, Habesoglu M, Oysu C, Egeli E, Tosun I (2010) Schwannoma of the tongue in a child. Am J Otolaryngol 31:46–48
63. Cigdem T, Tulay E, Bars N, Mehmet H, Cagatay O, Erol E, Ikay T (2010) Schwannoma of the tongue in a child. Am J Otolaryngol Head and Neck Med and Surg 31:46–48
64. Jeffcoat B, Pitman K, Brown A, Baliga M (2010) Schwannoma of the oral tongue. Laryngoscope 120(Suppl 4):S154
65. Naidu G, Sinha S (2010) Schwannoma of the tongue: an unusual presentation in a child. IJDR 21:457–459
66. Luklić I, Müller D, Virag M, Manojlović S, Ostović K (2011) Schwannoma of the tongue in a child. J Cranio-maxillofac Surg 39:441–444
67. Batra U, Usha G, Gogia A (2011) Anesthetic management of schwannoma of the base of the tongue. JOACCP 27:241–243
68. Nisa L, Bürün T, Tiab A, Giger R (2011) Giant plexiform schwannoma of the tongue. Case Rep Otolaryngol. doi:10.1155/2011/762524
69. Monga S, Malik J, Sharma A (2013) Schwannoma tongue. JCR. http://dx.doi.org/10.17659/01.2013.0052.
70. Erkul E, Çınk H, Haholu A, Cekin E, Güngör A (2013) Schwannoma of the tongue: a report of two cases and review. OLGU SUNUMU/CASE REPORT. doi:10.5455/gulhane.39838
71. Jayaraman V, Balasubramanian B, Senthivelu R (2013) Schwannoma of the tongue—a rare clinical entity. IUDS 1:53–55
72. Nibhoria S, Tiwana K, Phutela R, Kaur J (2015) Schwannoma of tongue: a rare case presentation with review of literature. IJSS 3:147–149. doi:10.17354/ijss/2015/291
73. Gopalakrishnan S, Jayaraman N, Albina SAL (2016) Schwannoma over tongue base—case report and review. Otolaryngol Online J 6:1–7
74. Sharma S, Rai G (2016) Schwannoma (neurilemmoma) on the base of the tongue: a rare clinical case. AM J Case Rep 17:203–206
75. Kavčič I, Božič M (2016) Schwannoma of the tongue: BMJ Case Rep.1:4. doi:10.1136/bcr-2016-215799
76. Lee H, Won S, Kim J, Woo S (2016) A case of schwannoma of the tongue base. Korean J Otorhinolaryngol-Head Neck Surg 59:229–232. doi:10.3342/kjorl-hns.2016.59.3.229