

A case of tongue cancer in which it was difficult to distinguish cervical lymph node metastasis owing to post-treatment Hodgkin's lymphoma recurrence versus tongue cancer metastasis

Yu Ohashi¹, Katsunori Katagiri¹, Daisuke Saito¹, Shin-ichi Oikawa¹, Kodai Tsuchida¹, Jun Miyaguchi¹, Takahiro Kusaka¹, Hiroyuki Yamada¹, and Kiyoto Shiga¹

¹Iwate Medical University

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Abstract

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Yu Ohashi^{1,2)}, Katsunori Katagiri^{2,3)}, Daisuke Saito^{2,3)}, Shin-ichi Oikawa^{2,3)}, Kodai Tsuchida^{2,3)}, Jun Miyaguchi^{2,3)}, Takahiro Kusaka^{2,3)}, Hiroyuki Yamada^{1,2)}, Kiyoto Shiga^{2,3)}

1. Division of Oral and Maxillofacial Surgery, Department of Reconstructive Oral and Maxillofacial Surgery, Iwate Medical University, School of Dentistry, Morioka, Japan
2. Head and Neck Cancer Center, Iwate Medical University Hospital, Yahaba, Japan
3. Department of Otolaryngology-Head and Neck Surgery, Iwate Medical University, School of Medicine, Yahaba, Japan

Abstract

We report a case in which it was difficult to distinguish cervical lymph node involvement from Hodgkin's lymphoma vs cervical lymph node metastasis from tongue cancer. Additionally, we report the histopathology for a postoperative follow-up biopsy of an enlarged lymph node in this patient with Hodgkin's lymphoma in remission.

1. Introduction

Cervical lymph node metastasis in oral cancer is often seen in the ipsilateral levels I, II, and III nodes, and skip-like metastasis to levels IV and V without metastasis in levels I-III is very rare.¹ To the best of our knowledge, there have been no reports of oral cancer that metastasized only to the contralateral cervical lymph nodes, with no metastasis to the cervical lymph nodes on the affected side. We report a case of tongue cancer that metastasized only to the contralateral cervical lymph node after treatment for Hodgkin's lymphoma, with a primary lesion in the ipsilateral cervical lymph node.

2. Case history and examination

The patient was a 74-year-old man. He had been aware of intractable stomatitis on the apex of his tongue for 1 year prior to his visit to our center. One month prior to his visit, an ulcer was observed in the same area;

therefore, he visited a dental clinic. He was referred to our center because tongue cancer was suspected. He had received six courses of doxorubicin hydrochloride, bleomycin, vinblastine, and dacarbazine for Hodgkin's lymphoma (mixed cell type, stage II) between 1 year and 6 months previously, which had remained in remission (Figure 1). He also had hypertension and dyslipidemia, and he had smoked 20 cigarettes per day from age 20 to 74 years. He drank a small amount of alcohol, was Flusher, and had no remarkable family medical history. He was 164.7 cm tall, weighed 63.5 kg, and had normal nutritional status. Two mobile, non-tender lymph nodes measuring 10 mm in the longest diameter were palpated in the left submandibular region. A tumor with ulceration and surrounding induration with the longest diameter of 26 × 20 mm was observed on the right tongue (Figure 2). And the tongue tumor was biopsied and found to be squamous cell carcinoma. Panoramic X-ray findings showed that the proximal roots of 44-46 were intact, and a dental implant was present in the equivalent area of 47. Bone resorption was seen around the remaining tooth, and diffuse osteosclerosis was also seen in the surrounding area (Figure 3). Computed tomography showed a 24 x 19.3 x 14.2-mm, large, contrast-enhanced tumor extending from the right lingual apex to the edge of the tongue, with the center of the tumor depressed. Hypo-absorption of contrast was seen in the left level IB and III lymph nodes (Figure 4). Magnetic resonance imaging revealed a contrast-enhanced 23.4 x 19.6-mm, large tumor with a depth of invasion (DOI) of 13.9 mm extending from the right lingual apex to the edge of the tongue (Figure 5). Fluorodeoxyglucose positron emission tomography/computed tomography revealed a tumor with abnormal accumulation and with a maximum standardized uptake value of 14.46 at the right lingual border. Additionally, enlarged lymph nodes were seen at left levels IB and III, with abnormal accumulation and maximum standardized uptake values of 4.10 and 9.00, respectively (Figure 6). No remarkable abnormalities were noted in the blood examination findings for both general blood tests and biochemical tests.

The tongue tumor was biopsied, and histopathology revealed a well-differentiated squamous cell carcinoma. Imaging of the lymph nodes at left levels IB and III was unclear regarding

whether the changes in these lymph nodes indicated metastases of the tongue cancer or recurrence of Hodgkin's lymphoma. Preoperative examination results were evaluated as tongue cancer, cervical lymph node metastasis (cT3N2cM0), or tongue cancer (cT3N0M0) and recurrent Hodgkin's lymphoma.

3. Treatment

After considering left-sided levels IB and III lymph node fine needle aspiration cytology or lymph node biopsy, it was decided that glossectomy and prophylactic neck dissection of the right cervical lymph nodes were indicated for the cT3 tongue cancer. We planned bilateral cervical dissection if squamous cell carcinoma was detected in the right cervical lymph nodes. If Hodgkin's lymphoma was detected in the right cervical lymph nodes, right-sided neck dissection was planned.

Surgery was performed on the basis of the results of a biopsy of an enlarged lymph node at left level IB. This lymph node was identified as metastatic squamous cell carcinoma on rapid diagnosis; therefore, bilateral neck dissection was performed. Right-sided neck dissection was performed as prophylactic neck dissection with supra-omohyoid neck dissection, and left-sided neck dissection was performed with extended supra-omohyoid neck dissection. Because the tongue tumor was located anterior to the sublingual surface, partial tongue resection did not create oral cavity and neck traffic. Tracheostomy was performed owing to concerns about postoperative airway narrowing because of the bilateral cervical dissection.

Histopathologically, the tongue cancer was radically resected, and one metastatic lymph node was found at left level IB and three at left level III, none of which showed extranodal extension (Figure 7). Additionally, the right cervical lymph node, which had been in remission after treatment for Hodgkin's lymphoma, showed no normal lymph node structure, with internal vitreous degeneration and no evidence of squamous cell carcinoma metastasis or Hodgkin's lymphoma (Figure 8). Postoperative radiation therapy with cisplatin chemotherapy was proposed owing to the multiple cervical lymph node metastases of tongue cancer; however, in accordance with the patient's strong desire, a follow-up plan was chosen.

4. Outcome and follow-up

Three months after treatment for tongue cancer and 1 year and 4 months after treatment for Hodgkin's lymphoma, a solitary enlarged lymph node was found at right level V. Lymphadenectomy was performed, and the diagnosis was a relapse of Hodgkin's lymphoma (Figure 9). Chemotherapy was proposed by the hematologist; however, follow-up was again chosen, in accordance with the patient's strong desire. Seven months after the tongue cancer treatment, there was no evidence of recurrence or metastasis of the tongue cancer or recurrence of new Hodgkin's-affected lymph nodes, and the patient is scheduled for further follow-up.

5. Discussion

The lymphatic flow in the tongue involves collecting lymphatic vessels in the lingual apex, lateral border of the tongue, central tongue, and posterior tongue. The lymphatic vessels in the lingual apex penetrate the hyoid muscle to the submandibular lymph node; those in the lateral border of the tongue penetrate the hyoid muscle to the submandibular lymph node; and those in the central tongue and posterior tongue reach the internal deep neck lymph nodes through the surface and back of the tongue hyoid muscle.² Each lymphatic vessel also has a left-right crossing and a pathway to the contralateral lymphatic flow.³ Haagensen et al. also noted the presence of capillary lymphatic intersections on the surface of the lingual apex and, in the deep part of the lingual apex, lymphatic flow passing under the muscle and crossing to the lymph nodes of the contralateral middle internal jugular vein.⁴ Previous reports suggest that tongue cancer often shows contralateral metastasis;^{5,6} however, all previous studies reported metastatic lymph nodes on the affected side as well,⁷ and there are no reports, to our knowledge, of metastasis only on the contralateral side.

The tongue cancer in this case was located at the apex of the tongue with a DOI of 13.9 mm. In the cervical lymph nodes, there was metastasis only on the contralateral side and none on the affected side. Because the tongue cancer was located at the apex of the tongue, and the DOI was deep, it is quite possible that the lymphatic flow pathways could have trafficked to the neck bilaterally, either superficially or deeply. Histopathologically, the cervical lymph node on the affected side in our case showed no normal lymph node structure. The interior showed vitreous degeneration, which suggested that lymphatic flow may have been blocked, and thus, no lymph node metastasis was seen. It is likely that previous chemotherapy for Hodgkin's lymphoma, which involved a primary lesion in the right cervical lymph node, caused degeneration of the lesion and blocked normal lymph flow. Additionally, in this case, we were incidentally able to perform histopathology after remission of Hodgkin's lymphoma. These data may be valuable because there have been no previous reports, to our knowledge, showing pathological findings or evaluation of foci that have achieved remission status with chemotherapy for Hodgkin's lymphoma. Furthermore, in the follow-up biopsy, there was a new relapse of Hodgkin's lymphoma of the neck, suggesting that lymphatic flow is unlikely to have been associated with the development of Hodgkin's lymphoma.

In formulating a treatment plan for this case, evaluation of the cervical lymph nodes was a challenge. This evaluation meant that it was necessary to determine whether the lesion in the contralateral cervical lymph node on imaging evaluation was a metastasis of tongue cancer or a recurrence of Hodgkin's lymphoma. There have been reports of cervical lymph node metastases from laryngeal cancer treated with cervical dissection, which were not metastatic lymph nodes but Hodgkin's lymphoma.⁸ However, to the best of our knowledge, there are no reports of cervical lymph node lesions for which it was difficult to evaluate whether the lesions were recurrent Hodgkin's lymphoma or metastases from tongue cancer, as in our case. Therefore, we considered the following treatment plan: The T classification of the tongue cancer in this case was cT3 because the DOI was > 10 mm, and the plan was to perform prophylactic right-sided neck dissection. After a diagnosis is confirmed by biopsy of the contralateral cervical lymph node, there is a method of treatment for tongue cancer. However, this method delays the start of tongue cancer treatment by several weeks as the patient waits for biopsy results, and the invasive procedure is performed twice, increasing the patient's psychological burden. Therefore, in this case, a contralateral lymph node biopsy was diagnosed quickly intraoperatively, and surgery for tongue cancer was performed at the same time. If the tongue cancer had been diagnosed as cT2, the same approach would have been followed, with intraoperative rapid diagnosis of the contralateral lymph node.

The American Cancer Society guidelines state that patients treated for Hodgkin’s lymphoma are at increased risk of developing various secondary cancers, and cancers of the “lip and oral cavity” are mentioned.⁹ In this case, the patient had undergone chemotherapy for Hodgkin’s lymphoma prior to the development of the tongue cancer, and the possibility of a second cancer was considered. With the availability of recent remarkable developments in chemotherapy, we should be aware of the development of secondary cancers in the oral cavity, which may be treatable with newer chemotherapy regimens. The evaluation of cervical lymph nodes in tongue cancer after treatment for Hodgkin’s lymphoma is important. In cases in which the main lesion is in the cervical lymph nodes, as in this case, lymphatic flow may be altered, and caution is needed in interpreting the imaging evaluation and planning a treatment strategy.

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Conflicts of interests

The authors declare that they have no conflicts of interests.

Author contributions

YO contributed to study concept and design and wrote the manuscript. KK, HY, KK, DS, SO, KT, JM, and TK contributed to data acquisition. We also confirm that all authors have read and approved the final version of this manuscript.

Ethical approval

The Iwate Medical University Institutional Review Board exempted ethics approval for case reports.

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Consent

Full consent for participation and publication was provided by the patient.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

1. Shah J. P., Patel S. G., and B. Singh. Jatin Shah’s Head and Neck Surgery and Oncology. Fourth Edition. Amsterdam: Elsevier/Mosby; 2012. 896 p.
2. Baker S. R. Malignant neoplasms of the oral cavity. In: Cummings C. W. et al.; Editors. Otolaryngology-Head and Neck Surgery. St. Louis: Mosby-Year Book; 1993. 1225-1256p.
3. Paff G. H. Lymph Nodes and Lymphatics of the Head and Neck. In: Anatomy of the Head and Neck. Philadelphia: W. B. Saunders; 1973.227-228p.
4. Haagensen C. D., Feind C. R., Herter, E. P., Slanetz C. A., and J. A. Weinberg. The Head and Neck. In: The Lymphatics in Cancer. Philadelphia/London/Toronto: W. B. Saunders Company; 1972. 135-149p.
5. Feind C. F. and R. M. Cole. 1969. Contralateral spread of head and neck cancer. American Journal of Surgery 118: 660-665.
6. Koch H. F. 1977. Irregular cervical dissemination of tumors of the maxillofacial region. Journal of Maxillofacial Surgery 5: 159-163.

7. Hiroshi K., Hiroichi K., Atsushi N., Jun-nosuke N., Takeshi K., Kenji, K., Minoru T., and M. Toshikazu. 2003. Clinical survey of contralateral cervical lymph node metastasis from squamous cell carcinoma of the mobile part of the tongue. *Japanese Journal of Oral and Maxillofacial Surgery* 49: 649-653.
8. Joo Y. H., Jung C. K., Dong-II Sun, Min-Sik Kim. 2009. Synchronous laryngeal squamous cell carcinoma and Hodgkin lymphoma of the head and neck region. *Auris Nasus Larynx* 36: 501-504.
9. American Cancer Society. Second Cancers After Hodgkin Lymphoma. <https://www.cancer.org/cancer/hodgkin-lymphoma/after-treatment/secondcancers.html>. Accessed July 21, 2021.

Figure Legends

Figure 1: Findings at the time of Hodgkin's lymphoma

Fluorodeoxyglucose positron emission tomography revealed many lymph nodes with abnormal accumulation and with a maximum standardized uptake value of 15.7 at the right cervical lymph node (A). Histopathological findings. Hematoxylin-eosin stain of the lymph node (A), Positive results were observed in the immunohistochemical study for CD30 (C) and PAX5 (D).

Figure 2: Findings of the tongue tumor

A tumor was observed on the right tongue. The tumor was 28 mm in long diameter, with induration around the tumor and in the deep tissues.

Figure 3: Findings of the Panoramic X-ray image

The proximal roots of 44-46 were intact, and a dental implant was present in the equivalent area of 47.

Figure 4: Findings of the Computed Tomography

The tumor was 24 × 19.3 × 14.2-mm from the right lingual apex to the edge of the tongue (A). Mildly swollen lymph node was observed in the right Level III (B). Hypoabsorption of contrast was seen in the left level IB (C) and III (D) lymph nodes.

Figure 5: Findings of the Magnetic resonance imaging

The tumor was 23.4 × 19.6-mm, large tumor with a depth of invasion (DOI) of 13.9 mm from the right lingual apex to the edge of the tongue (A). Mildly swollen lymph node was observed in the right Level III (B). Hypo-absorption of contrast was seen in the left level IB (C) and III (D) lymph nodes.

Figure 6: Findings of the Fluorodeoxyglucose Positron Emission Tomography

The tumor was seen with abnormal accumulation and with a maximum standardized uptake value of 14.46 at the right lingual border. Additionally, enlarged lymph nodes were seen at left levels IB (C) and III (D), with abnormal accumulation and maximum standardized uptake values of 4.10 and 9.00, respectively. There was no accumulation in the right Level III lymph node (B).

Figure 7: Histopathological Findings of tongue cancer and cervical lymph nodes at the left Level IB and Level III

The tongue squamous cell carcinoma was radically resected (A). Metastatic lymph node of squamous cell carcinoma was found at left level IB (B) and three at left level III (C), none of which showed extranodal extension.

Figure 8: Histopathological Findings of cervical lymph nodes at the right Level III

The right cervical lymph node showed no normal lymph node structure, with internal vitreous degeneration and no evidence of squamous cell carcinoma metastasis or Hodgkin's lymphoma. (A) Macro image, (B) Enlarged image

Figure 9: Findings at the relapse of Hodgkin's lymphoma

The Computed Tomography revealed a lymph node at the right Level V (A). Histopathological findings. Hematoxylin-eosin stain of the lymph node (B), Positive results were observed in the immunohistochemical study for CD15 (C) and CD30 (D).

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