



OPEN ACCESS

# Case of anterior glottic web with bilateral vocal cord cancers

Takeshi Kusunoki ,<sup>1</sup> Ryo Wada<sup>2</sup>

<sup>1</sup>Department of Otorhinolaryngology, Juntendo University of Medicine Shizuoka Hospital, Izunokuni-shi, Japan  
<sup>2</sup>Department of Pathology, Juntendo Daigaku Igakubu Fuzoku Shizuoka Byoin, Izunokuni, Japan

**Correspondence to**  
Professor Takeshi Kusunoki;  
tkusunoki001@aol.com

Accepted 17 August 2022

## SUMMARY

We experienced a case of anterior glottic web with bilateral vocal cord cancers. The laryngoscopic findings showed milky tumour lesions on bilateral vocal cords and a web-like formation with an adhesion in the anterior commissure. In this case, we performed laryngomicrosurgery to remove the bilateral vocal cord tumours and the anterior glottic web. This case was diagnosed as bilateral glottic carcinoma (laryngeal carcinoma TNM classification: pT1bN0M0) with an anterior glottic web. Therefore, this patient underwent radiation therapy (66 Gy). At present, one and a half years have passed since the end of radiotherapy. There is no recurrence of the glottic cancer or web. The airway at the glottis was patent. It has been reported that cutting-off the anterior glottic web could easily lead to readhesion. Accordingly, we continued to follow-up to determine whether there was a recurrence of readhesion of the anterior glottic web or glottic cancer.

## BACKGROUND

The glottic web can cause dysphonia or dyspnoea due to membrane-like structures between the bilateral vocal cords. This disease is classified as congenital and acquired types. There have been few cases of congenital glottic web, and many were the acquired type.<sup>1,2</sup> Holinger<sup>3</sup> and Kou<sup>4</sup> reported that congenital webs represent <5% of all congenital laryngeal anomalies. Kou<sup>4</sup> recommended that all patients with anterior glottic web should be evaluated for chromosome 22q11.2 deletion syndrome. Acquired cases would be caused by inflammation and damaged vocal cords due to various factors.<sup>5-7</sup> Watanabe *et al*<sup>6</sup> reported that many cases with acquired glottic webs involved a postoperative factor (44.7%). Figi<sup>7</sup> described cases that did not arise from postoperative causes including infections such as syphilis, tuberculosis, leprosy, blastomycosis, rhinoscleroma and infectious granulomas. There has been no report of a case of glottic web with laryngeal cancers. We experienced a case of anterior glottis web with bilateral vocal cord cancer and present the clinical findings, including histopathological examination, treatments, progress and some consideration of the relevant literature.

## CASE PRESENTATION

A patient was Japanese man in his 60s. His chief complaint was hoarseness 1 month before, but experienced no dyspnoea. He was diagnosed with bilateral vocal cord polyps by a medical practitioner. This practitioner introduced him to our hospital. At the first examination, the laryngoscopic findings showed milky

tumour lesions on bilateral vocal cords and a web-like formation with adhesions including anterior commissure (figure 1). The laryngeal lesions were very small and could not be found in the CT scan. Visual palpation, echo and CT scan revealed no cervical lymph node metastasis and no lung metastasis findings. The preoperative diagnosis was anterior glottic web with bilateral vocal cord tumours. The patient underwent laryngomicrosurgery to remove the bilateral vocal cord tumours, and the anterior glottic web was cut-off and removed. On histopathological examination, all of the bilateral vocal cord tumours and the tumour in the anterior glottic web could be observed as squamous cell carcinoma with granulation formations in the background and surrounding invasion (figure 2). The postoperative diagnosis was bilateral glottic carcinoma (laryngeal carcinoma TNM classification: pT1bN0M0) with an anterior glottic web. Therefore, the patient received radiation therapy (66 Gy).

## OUTCOME AND FOLLOW-UP

At present, he has had no recurrence of glottic carcinomas and no readhesion in the regions where the web was removed one and a half years since the end of radiotherapy (figure 3).

We performed the GRBAS scale, maximal phonation time (MPT) and voice handicap index (VHI)–10 with voice evaluation before and one and a half years after the treatment. The GRBAS scale is widely performed for the evaluation of hoarseness. There are five graded scales: hoarseness (G), rough (R), breathy (B), asthenic (A) and strained (S). A four-point grading of the severity of GRBAS includes ‘0’ normal, ‘1’ slight,

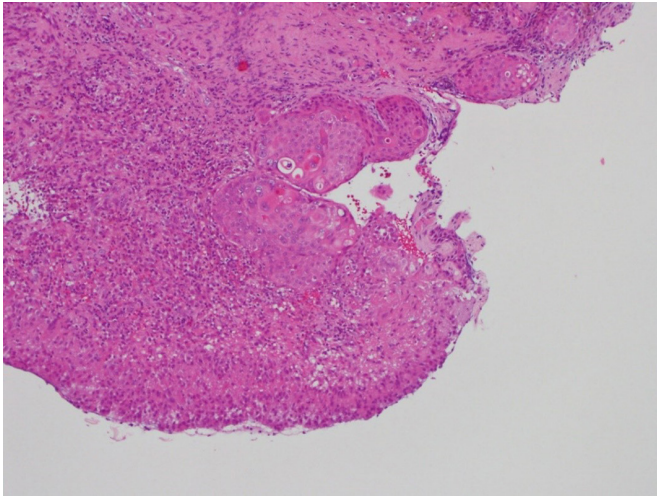


**Figure 1** At the first examination, the laryngoscopic findings revealed milky tumours on both vocal cords and a web-like membrane with adhesions including the anterior commissure.



© BMJ Publishing Group Limited 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

**To cite:** Kusunoki T, Wada R. *BMJ Case Rep* 2022;**15**:e250411. doi:10.1136/bcr-2022-250411



**Figure 2** In the histopathological findings (H&E stain), all bilateral vocal cord tumours and the tumour in the anterior glottic web could be observed as squamous cell carcinoma with granulation formations in the background and surrounding invasion.

'2' moderate and '3' extreme. The GRBAS scale, MPT and VHI-10 of the pretreatment were G3R3B1A0S3, 10s and 26. GRBAS scale, MPT and VHI-10 of post-treatment were G0R0B0A0S0, 25s and 0. From the above findings, his hoarseness had remarkably improved one and a half years after the treatment.

## DISCUSSION

Xu *et al*<sup>8</sup> mentioned that stenosis of the glottis could influence both phonation and respiration. Matrka<sup>9</sup> recommended surgery of the anterior glottic webs for air restriction or symptomatic dysphonia. The chief complaint of our patient was hoarseness, and Hirano *et al*<sup>10</sup> reported that the vocal process divides the glottis into two parts. The area of the anterior glottis is from the anterior commissure to the vocal process. The area of the posterior glottis is from the



**Figure 3** The bilateral glottic carcinoma (laryngeal carcinoma (TNM classification: pT1bN0M0) with an anterior glottic web was treated with radiation therapy (66 Gy), and there has been no recurrence of the glottic carcinomas and no readhesion in the region where the web was removed one and a half years since the end of radiotherapy. The airway has remained patent.

vocal process to the posterior wall of the larynx. The function and histology of the anterior glottis are phonation and stratified squamous epithelium. The function and histology of the posterior glottis are to maintain the airway and pseudostratified epithelium as one type of respiratory epithelium. Therefore, the pathophysiological differences depend on the location of the glottic adhesions. Our case was anterior glottic web and the chief complaint was hoarseness. The main symptom of the posterior glottis web would be a respiratory problem.

Sato *et al*<sup>11</sup> described that anterior glottic webs are two types. One type is a laryngeal diaphragm which shows a web-like formation with adhesions including the anterior commissure. The other type is a bridge-like adhesion in the anterior glottis. Our case would correspond to the former laryngeal diaphragm type. The tissues of the glottic web showed inflammation with granulation and fibrotic scars, regardless of the causes.<sup>7</sup> Our histopathological findings revealed the anterior glottic web with squamous cell carcinoma and granulation formations in the background. The mechanism would be considered continuous inflammation of the vocal cord cancer resulting in the formation of granulation and scarring. Cases with readhesion of the anterior glottis after operation have been reported. Hirayama *et al*<sup>5</sup> performed laryngomicrosurgery in 6 cases with anterior glottic web and 4 cases experienced readhesion of the anterior glottic postoperatively. In order to prevent readhesion after cutting the anterior glottic web, Figi<sup>7</sup> and Adachi<sup>12</sup> suggested skin graft and fibrin coating for the wound after cutting the web. Umeno *et al*<sup>13</sup> Chen<sup>14</sup> Paniello<sup>15</sup> and Edwards<sup>16</sup> tried using a silicone tube and stent or keel placement. Xu *et al*<sup>8</sup> described mucosal suturing of the vocal fold with placement of a stent. However, most reports including those above that were concerned with protective methods for postoperative readhesion in the anterior glottis web did not discuss the success or recurrence after a long-term follow-up. Veen<sup>17</sup> reviewed mitomycin C in the aerodigestive tract in human studies and the follow-up period in 27 of 32 references was within 2 years or not reported. Our case was cancers of bilateral vocal cords with an anterior glottic web. Postoperative radiation therapy was administered without protective methods to prevent postoperative readhesion. After radiation therapy, we did not add it, because such methods would prevent us from determining whether there was a recurrence of anterior glottic web and glottic cancers.

Some hospitals<sup>18 19</sup> have reported the results of CO<sub>2</sub> laser cordectomy for glottic cancer. However, CO<sub>2</sub> laser therapy for wide lesions with bilateral vocal cords including web would worsen the dysphonia and increase the possibility of readhesion of the postoperative wounds. Therefore, we did not select CO<sub>2</sub> laser. Our patient underwent laryngomicrosurgery to remove laryngeal cancer tumours, and to cut-off and remove the anterior glottic web.

This simple resection and the postoperative radiotherapy showed no recurrence of the glottic carcinomas and no readhesion of anterior glottis. The reason would be considered the complete disappearance of residual cancer in the bilateral vocal cords and web by radiotherapy and re-epithelialisation of the wounds. Histopathological examination revealed the diagnosis as laryngeal carcinoma T1bN0M0. For early stage laryngeal carcinoma, radiotherapy is recommended.<sup>20-23</sup> Moreover, since the histopathological findings in our case showed surrounding infiltration of the cancer, we considered the possibility of residual laryngeal cancer. Therefore, we administered radiation therapy (66 Gy) postoperatively. In Japan, Harada *et al*<sup>20</sup> retrospectively studied the 5-year local control rates of radiotherapy for early glottic cancer (T1-T2N0) and revealed 92% in T1a, 83% in T1b (as in our case) and 86% in T2. In other countries, Zouhair *et*

*al*<sup>22</sup> described that the 5-year overall, cancer-specific and disease-free survival after radiation therapy alone in the early-stage were 80%, 94% and 70%, respectively. Jones *et al*<sup>23</sup> discussed that radiotherapy and surgery for early laryngeal cancer (T1-T2 N0) were matched. The methods of the surgery included horizontal or vertical partial laryngectomy and cordectomy. The 5-year tumour-specific survival after radiotherapy and surgery were 87% and 77%. He concluded that both radiotherapy and surgery were equally effective for early laryngeal cancer. Speech and voice of the patients treated by radiotherapy were significantly better than those treated by surgery. At present, our patient has no recurrence of glottic carcinomas and no readhesion in the web region one and a half years since the end of radiotherapy. His hoarseness has completely improved. We need to continue follow-up for at least 5 years to determine whether readhesion anterior glottic web or glottic cancer has recurred.

### Learning points

- ▶ We encountered a case of anterior glottic web with bilateral vocal cord cancer. Commonly, histopathology of the glottic web is known to be formed from inflammation with granulations and fibrotic scarring. However, there have been rare cases, as in our case, that showed anterior glottic web with vocal cord cancer. Therefore, such cases require histopathological study using laryngomicrosurgery.
- ▶ Our patient underwent radiation therapy (66 Gy) postoperatively and there has been no recurrence of the glottic carcinomas and no readhesion of anterior glottis. Some studies have presented cases in which there was readhesion of the anterior glottis postoperatively. Therefore, we should continue to follow-up.
- ▶ It has reported that both radiotherapy and surgery were equally effective for early laryngeal cancer. Speech and voice of the patients treated by radiotherapy were significantly better than those treated by surgery.

**Correction notice** This article has been corrected since it was online published. The funding statement has been included.

**Acknowledgements** The authors thank Mr Brent Bell for reading the manuscript.

**Contributors** TK: diagnosis and therapy, composition of this manuscript. RW: pathological diagnosis.

**Funding** This work was supported in part by a Grant-in-Aid for Special Research in Subsidies for ordinary expenses of private schools from The Promotion and Mutual Aid Corporation for Private Schools of Japan.

**Competing interests** None declared.

**Patient consent for publication** Consent obtained directly from patient(s).

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially,

and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

### ORCID iD

Takeshi Kusunoki <http://orcid.org/0000-0003-2455-6233>

### REFERENCES

- 1 Shibata S, Nakai Y, Yusida K. Two cases of laryngeal web. *Pract Otol(Kyoto)* 1966;59:496–500.
- 2 Kawaguchi T, Kurita T, Chitose S, *et al*. A case of anterior glottic web due to vomiting diarrhea. *Larynx Japan* 2019;31:40–4.
- 3 Holinger PH, Brown WT. Congenital webs, cysts, laryngoceles and other anomalies of the larynx. *Ann Otol Rhinol Laryngol* 1967;76:744–52.
- 4 Kou IC, Rutter M. Surgical management of anterior glottic webs. *Front Pediatr* 2020;19.
- 5 Hirayama M, Shitara T, Hirose H, *et al*. A clinical study of vocal cord adhesion. *J Jpn Bronchoesophagol Soc* 1994;45:318–22.
- 6 Watanabe H, Shin T, Morikawa I, *et al*. Laryngeal web. *Otologia Fukuoka* 1990;36:191–3.
- 7 Figi FA. Chronic stenosis of the larynx with special consideration of skin grafting. 1940. *Ann Otol Rhinol Laryngol* 1994;103:249–64.
- 8 Xu W, Han D, Hu H, *et al*. Endoscopic mucosal suturing of vocal fold with placement of stent for the treatment of glottic stenoses. *Head Neck* 2009;31:732–7.
- 9 Matrka L, Simpson CB. Anterior glottic webs. *Oper Tech Otolaryngol Head Neck Surg* 2012;23:111–6.
- 10 Hirano M, Yoshida T, Kurita S, *et al*. Functional anatomy of the posterior Glottis. *Pract Otorhinolaryngol* 1986;79:343–50.
- 11 Sato T, Nito T, Goto T, *et al*. A case of Bridge-like adhesion in the anterior Glottis after vomiting. *J Jpn Bronchoesophagol Soc* 2018;69:22–6.
- 12 Adachi K, Umezaki T. Effectiveness of fibrin coating in the management of web formation after laryngomicrosurgery. *Am J Otolaryngol* 2017;38:1–6.
- 13 Umeno H, Chitose S, Ueda Y, *et al*. New silicone tube placement therapy for patients with an anterior glottic web. *J Laryngol Otol Suppl* 2009;31:97–9.
- 14 Chen J, Shu Y, Naunheim MR, *et al*. Prevention of laryngeal webs through endoscopic keel placement for bilateral vocal cord lesions. *Front Med* 2018;12:301–6.
- 15 Paniello RC, Desai SC, Allen CT, *et al*. Endoscopic keel placement to treat and prevent anterior glottic webs. *Ann Otol Rhinol Laryngol* 2013;122:672–8.
- 16 Edwards J, Tanna N, Bielamowicz SA. Endoscopic lysis of anterior glottic webs and silicone keel placement. *Ann Otol Rhinol Laryngol* 200;211–6.
- 17 Veen EJD, Dijkers FG. Topical use of MMC in the upper aerodigestive tract: a review on the side effects. *Eur Arch Otorhinolaryngol* 2010;267:327–34.
- 18 Mendelsohn AH, Kiagiadaki D, Lawson G, *et al*. CO2 laser cordectomy for glottic squamous cell carcinoma involving the anterior commissure: voice and oncologic outcomes. *Eur Arch Otorhinolaryngol* 2015;272:413–8.
- 19 Roedel RMW, Matthias C, Wolff HA, *et al*. Repeated transoral laser microsurgery for early and advanced recurrence of early glottic cancer after primary laser resection. *Auris Nasus Larynx* 2010;37:340–6.
- 20 Harada A, Sasaki R, Miyawaki D, *et al*. Treatment outcomes of the patients with early glottic cancer treated with initial radiotherapy and salvaged by conservative surgery. *Jpn J Clin Oncol* 2015;45:248–55.
- 21 Adeel M, Faisal M, Rashid A, *et al*. Outcomes of definitive radiotherapy for early laryngeal cancer in terms of survival and patterns of failure. *J Laryngol Otol* 2019;133:1087–91.
- 22 Zouhair A, Azria D, Coucke P, *et al*. Decreased local control following radiation therapy alone in early-stage glottic carcinoma with anterior commissure extension. *Strahlenther Onkol* 2004;180:84–90.
- 23 Jones AS, Fish B, Fenton JE, *et al*. The treatment of early laryngeal cancers (T1-T2 N0): surgery or irradiation? *Head Neck* 2004;26:127–35.

Copyright 2022 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <https://www.bmj.com/company/products-services/rights-and-licensing/permissions/>  
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

### **Customer Service**

If you have any further queries about your subscription, please contact our customer services team on +44 (0) 207111 1105 or via email at [support@bmj.com](mailto:support@bmj.com).

Visit [casereports.bmj.com](http://casereports.bmj.com) for more articles like this and to become a Fellow