Malakoplakia of Larynx: A Case Report and Literature Review of Localized Malakoplakia of Larynx

Shiying Zeng, Shisheng Li, Qian Yang, Qinglai Tang, Xiaojun Tang, Mengmeng Li, and Peiying Huang, *Changsha, China*

Summary: Background. Malakoplakia is a very rare benign granulomatous disease, which can invade multiple organ systems, and is often related to bacterial infection and weak immunity. It is rarely occurred in the larynx, once this happens, the patient would complain of cough, hoarseness, dysphagia, and even dyspnea.

Methods. We reported a case of malakoplakia of larynx. The patient complained of hoarseness and cough. Her lesion was located in the right false vocal cord. six case reports of malacoplakia in larynx were compiled from the literature and integrated with this case report.

Results. After excising the tumor, the symptoms of the patient with cough, hoarseness and dysphagia were improved, and there was no recurrence during 1-year follow-up. The postoperative pathological diagnosis is malakoplakia. We found that malacoplakia is more commonly located in the supraglottic region, and we speculate that there may be a relationship between larynx-associated lymphoid tissue (LALT) and laryngeal malakoplakia. The effect of surgical treatment for laryngeal malacoplakia is satisfactory.

Conclusion. Malakoplakia of the larynx is rare. Bacterial infection, immune deficiency, and the distribution of LALT may be related to the pathogenesis and supraglottic localization of malakoplakia. The symptoms are related to the location and size of the mass and may be serious and fatal. Surgery is an important treatment for preserving laryngeal function and low recurrence rate.

Key Words: Larynx−Malakoplakia−Supraglottic region−Immunocompromised patients.

INTRODUCTION

Malakoplakia is a kind of rare chronic granulomatous disease that was first described in 1902.[1] It is a very rare benign granulomatous disease, which can invade multiple organ systems, the most common is genitourinary tract invasion.[2] The etiology of malakoplakia has not been fully understood, but the pathological features are similar in all organs. Some possible mechanisms have been suggested in previous studies, immunocompromise mechanisms were convinced, and abnormal immune response may be involved in pathogenesis. It has been mainly described in immunocompromised patients or patients with chronic debilitating conditions, like patients with HIV/AIDS, autoimmune disease, diabetes mellitus, tuberculosis, alcohol abuse, post-transplant, etc. [3-8] And most patients have bacterial infections, micro-organisms, such as Escherichia coli, Staphylococcus aureus, Rhodococcus equi, and so on were mentioned in some reports about malakoplakia.[9-11] As the initial presenting symptoms are non-specific and mainly depend on the location of the lesion, so the diagnosis of malakoplakia depends on the histological discovery of Michaelis-Gutmann bodies (MG bodies). Malakoplakia of larynx is extremely rare. Larynx is the only breath tunnel of humans, once blocked by malakoplakia, it is always severe and fatal. In this report, we describe one novel case of laryngeal malakoplakia, make a brief review of the malakoplakia located in larynx, and carried out clinical-related discussions.

Case presentation

A 65-year-old female, with a clinical history of hypertension, Parkinson's disease, cerebral infarction, and myocardial infarction came to our institution due to hoarseness and cough after catching a cold in July 2019, the result of an electronic laryngoscope (Figure 1A) showed nodular eminence on the surface of the right false vocal cord. As the basic condition of the woman was poor at that time, for comprehensive consideration, we decided to perform oral anti-inflammatory and anti-acid drugs treatment, but the symptoms did not significantly improve, since then she came to our hospital for out-patient review several times. After 6 months, the female came to our institution again. Her symptom of hoarseness was more serious, the electronic laryngoscope result showed that the mass grew obviously (Figure 1B), the right vocal cord was depressed and the activity of the right vocal cord was also diminished. So the operation was decided. Preoperative computed tomography (CT) scan of the neck showed a mass at the right false vocal cord level that invaded the paraglottic space (Figure 2). Laser resection of laryngeal tumor by suspension-laryngoscope was performed and the mass was resected completely. Postoperative pathological results are shown in Figure 3, microscopically, the lamina propria was infiltrated with eosinophilic and granular cytoplasm, with lymphocytes and

Accepted for publication August 5, 2022.

Funding: This research was supported by the Natural Science Foundation of Hunan Province (No. 2020JJ4791), Changsha Science and Technology Project (No. kq1901121)

Conflicts of interest: The author states that there is no conflict of interest.

From the Department of Otolaryngology, Head and Neck Surgery, The Second Xiangya Hospital, Central South University, 168 Shaoshan North Road, Furong district, Changsha, Hunan, China.

Address correspondence and reprint requests to Shisheng Li, Second Xiangya Hospital of Central-South University, 168 Shaoshan North Road, Furong district, Changsha, Hunan, 410011, China. E-mail: lissdoctor@csu.edu.cn

Journal of Voice, Vol. ■■, No. ■■, pp. ■■−■■

0892-1997

https://doi.org/10.1016/j.jvoice.2022.08.011

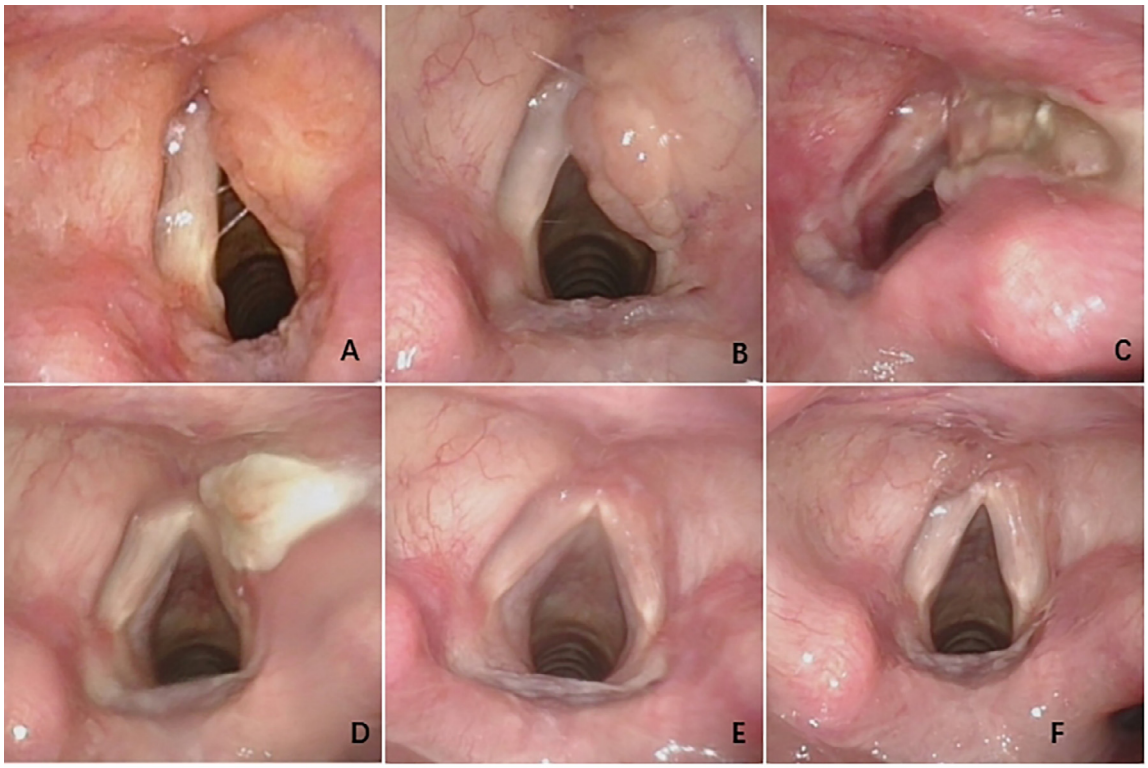

FIGURE 1. (A) showed nodular eminence on the surface of the right ventricular zone; (B) is the laryngoscope before the operation, and the nodular is larger than that of, and covers the vocal cord; (C) is the laryngoscope of the patient 3 days after the operation, the tumor was removed and the wound was covered with pseudomembrane; (D) is the 1 months after the operation, a little granulation tissue can be observed and no mass was found; (E and F) were the postoperative electronic laryngoscopes reexamined 6 months and 1 year respectively, granulation tissue at the operation site had been well repaired, and the patients recovered well without recurrence.

plasma cells infiltration, and Michaelis-Gutmann bodies were easily found in the case and thus the case was diagnosed as malakoplakia. The electronic laryngoscope 3 days (Figure 1C) after operation showed that the vocal cord was not injured and the supraglottic wound was covered with pseudo membrane. The hoarseness symptoms of the patient improved significantly 2 weeks after the operation. The electronic laryngoscope 1 month after operation is shown in Figure 1D, and granulation tissue can be observed. Figure 1E and Figure 1F were the postoperative electronic

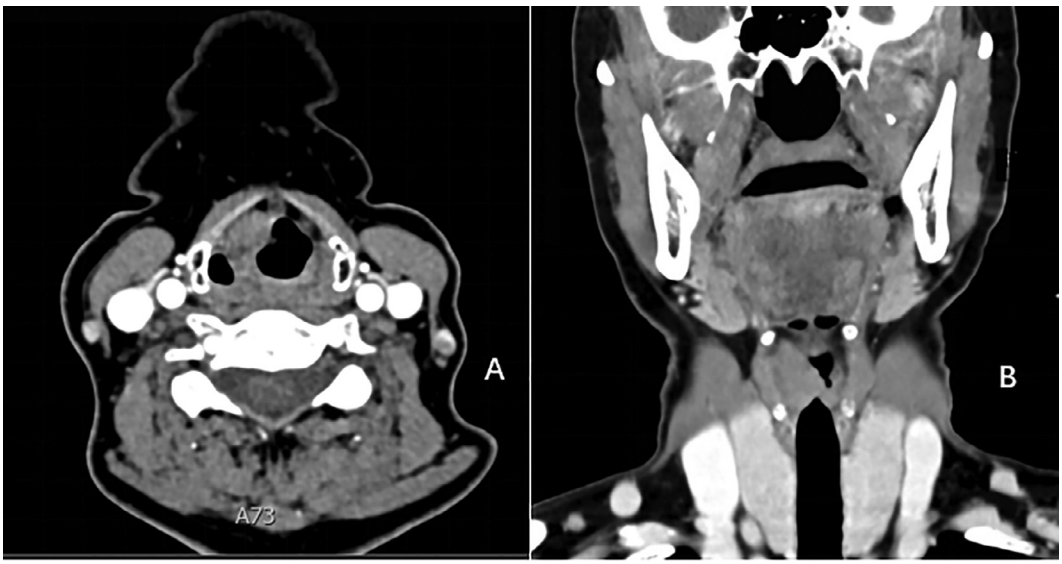

FIGURE 2. Computed tomography scan showing a heterogeneous soft-tissue mass situated in the right vocal cord.

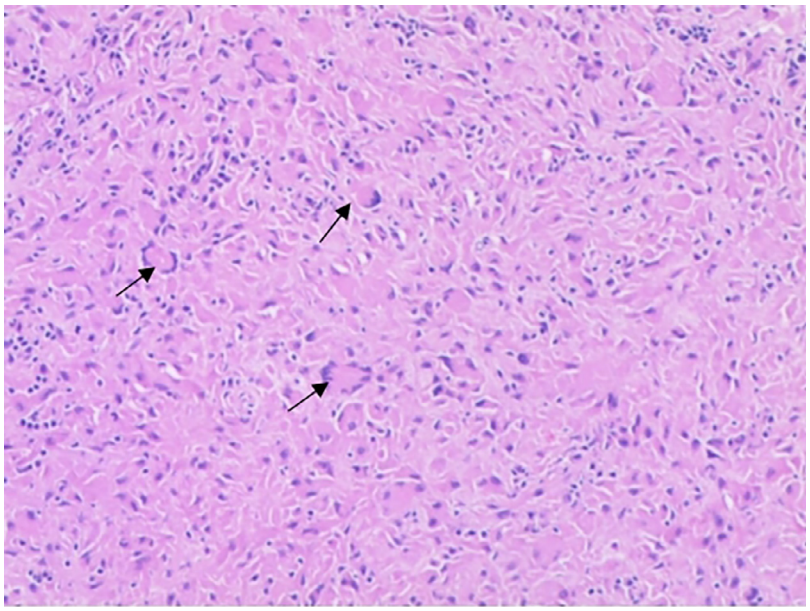

FIGURE 3. Postoperative pathological examination (hematoxylin-eosin staining,100-fold) showed eosinophilic infiltration, lymphocyte and plasma cell infiltration in lamina propria, and M-G body (arrow) were easily found, which was consistent with malakoplakia.

laryngoscopes re-examined at 6 months and 1 year respectively, granulation tissue disappeared, and the malakoplakia recurrence was not found. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Literature review

We performed a literature search with PubMed (National Library of Medicine, Bethesda, MD, USA) (http://www.nlm.ncbi.nih.gov/pubmed/) to identify papers reporting adult cases of Malakoplakia of larynx. Malakoplakia, throat, larynx, laryngeal, and other words related to larynx as keywords were used for retrieval. We have retrieved seven reports about the malakoplakia of the larynx. Among them, the malakoplakia of three cases occurred in the vallecula,[12-14] one case in the epiglottis,[15] three cases in the false vocal cord (including this case). [16,17] This case report is combined with a literature review (Table 1).

DISCUSSION

Malakoplakia is most common in the bladder and may affect any part of the urinary system, and even other organs, such as the gastrointestinal tract, lung, thyroid,[18] rarely described larynx. It can be seen from Table 1 that patients with laryngeal malakoplakia are the elderly or immunocompromised, just like most patients with malakoplakia appeared in other parts of the body.[18] The common presentation is hoarseness, sore throat, dysphagia, and even other symptoms of throat irritation or obstruction. Only one case complained of dyspnea. One case of them presented no symptoms.[14] It can be seen from these cases that the symptoms are mainly related to the size and location of the malakoplakia. The larynx connects the external environment and digestive tract and lower respiratory tract and is an important part of integrating breathing, swallowing pronunciation, and other important functions. Therefore, once the larynx is invaded by space-occupying lesions, there may be respiratory obstruction, sound changes, dysphagia, other consequences, and even asphyxia in serious cases. Direct laryngoscopy is particularly important for this kind of laryngeal lesions.[19] Since malakoplakia has non-specific symptoms, the diagnosis depends on Michaelis-Gutmann bodies (M-G bodies) found in histological examination.

Five patients were single tumor, and two patients had multiple tumors. The neoplasms in all cases with a single tumor, including our case, were found in the supraglottic region. In the two cases with multiple tumors, in addition to the supraglottic region, lesions were also found in the trachea[16] and vocal cords [17] respectively. The malakoplakia is usually associated with gram-negative bacilli infection[18], and is common in immunocompromised patients.[3] Since the throat is connected with the external environment, multiple symbiotic bacteria and potential pathogens including Hemophilus influenzae, Moraxella catarrhalis, Streptococcus pneumoniae (pneumococcus), and Staphylococcus aureus resident here,[20] they could turn into pathogens occasionally, such as when the body's immune system is weakened. On the other hand, lymphoid tissue is important in the induction of immune reactions and mucosa-associated lymphoid tissue (MALT) plays a central role in mucosal immunity. Studies had shown that there was an association between malakoplakia and an exuberant lymphoid response,[21] which is related to MALT-type lymphoma. Although a cause-and-effect relationship between malakoplakia and malignancy has not been clear, an association with lymphoma is well-documented, especially

TABLE 1.
Review of Literature Combined With Current Case

Characteristic	Case 1[12]	Case 2[13]	Case 3[14]	Case 4[15]	Case 5[16]	Case 6[17]	Case 7(This Case)
Gender	Female	Female	Male	Female	Female	Male	Female
Age	50	72	82	45	32	61	65
Past history	NR	NR	Surgery and radiation therapy for recurrent prostate carcinoma	Increased infection index	Chronic pulmonary infection, heavy smoker	Heavy smoker	After a cold
Symptoms	Pain and irritation in throat	Hoarseness	No symptoms	Hoarseness, sore throat, dysphagia	Hoarseness, hemoptysis, fever	Hoarseness and mild dyspnea	Hoarseness
Site	Left vallecula	Right vallecula	Left vallecula	Epiglottis	Left arytenoid cartilage, false vocal cord, trachea	Right vocal cord, right piriform sinus, right false vocal cord	Right false vocal cord
Number	Single	Single	Single	Single	Multiple	Multiple	Single
Bacteria	NR	NR	NR	NR	E coli	NR	NR
Antibiotics	Ciprofloxacin	NR	NR	Ciprofloxacin	E coli	NR	NR
Surgery	NR(biopsy)	Excised	NR	Excised	NR	Excised	Excised
Outcomes	Recovered	Recovered	NR	Recovered	Unavailable for follow-up	Recovered	Recovered

Abbreviations: NR, Not report.

MALT lymphoma.[22] Kracke et al.[23] found that larynx-associated lymphoid tissue (LALT) was similar to MALT in the human gut. LALT may be a regular part of the mucosal immune system. Hiller et al.[24] showed that LALT was identified in supraglottic area in 80% of the patients younger than 20 and 56% of the patients older than 20. But LALT is usually absent in glottic and subglottic areas. The location of LALT may be the reason why the laryngeal malakoplakia was always found in supraglottic areas. Therefore, concerning the pathogenesis, in addition to chronic immune stimulation by bacterial infection and immunodeficiency, we hypothesize that the distribution of LALT may be related to malakoplakia.

All the patients who underwent surgical resection recovered with no recurrence, one of them[15] received postoperative antibiotic treatments, but no etiological examination was performed. One[12] case also recovered after antibiotic treatment, although they did not report surgical resection, they performed a biopsy of the pedicled lesion, so the lesion may have been removed. Lewis et al[14] reported a case conjecture, so they did not report whether the case was operated on or followed up. Mollo et al[16] did not report whether their case had undergone surgery, and their case dropped out during follow-up. Due to the paucity of cases, there has been no retrospective research on laryngeal malakoplakia yet. Treatment options have to be based on the research results of all the malakoplakia whose original sites distribute in bladder, gastrointestinal tract, and so on. The treatments include prolonged antimicrobial therapy, bethanechol chloride, immunosuppression reduction, and surgery.[25] The treatment of malakoplakia localized to the lower urinary tract is conservative, but for laryngeal malakoplakia, surgery may be a good choice. Because of supraglottic region location, malakoplakia can be resected with preservation of laryngeal function. With the results of previous case reports of laryngeal malakoplakia, single surgery had achieved good results in a short time follow-up, of course, except for patients with immunodeficiency.[26] Our case had shown a satisfactory curative effect. In this case, malakoplakia recurrence was not found in a one-year follow-up.

In conclusion, malakoplakia in the larynx is rare. Chronic immune stimulation by bacterial infection, immunodeficiency, and distribution of larynx-associated lymphoid tissue (LALT) may be related to the pathogenesis and supraglottic location of malakoplakia. The symptoms are related to the location and size of the mass and could be severe and fatal, and surgery is an important treatment with preservation of laryngeal function and a low recurrence rate.

AUTHOR'S CONTRIBUTION

Shiying Zeng, conception, data collection, analysis, interpretation, drafting; Shisheng Li, conception, analysis, interpretation, revision, approval; Qian Yang, data collection, analysis, drafting; Qinglai Tang, revising it critically for important intellectual content; Xiaojun Tang, data

collection, analysis, drafting; Mengmeng Li, data collection, analysis; Peiying Huang, data collection, analysis;

REFERENCES

1. Michaelis LGC. Ueber einclusse in blasentumoren. *Klein Med*. 1902;47:208–215.
2. McClure J. Malakoplakia. *J Pathol*. 1983;140:275–330.
3. Blair JE, Maclennan GT. Malakoplakia. *J Urol*. 2005;173:986.
4. Pan Y, Hong YC, Shih HJ, et al. Malakoplakia and xanthogranulomatous pyelonephritis treated with nephrectomy: A case report. *Medicine (Baltimore)*. 2021;100:e27137.
5. Lee M, Ko HM, Rubino A, et al. Malakoplakia of the gastrointestinal tract: clinicopathologic analysis of 23 cases. *Diagnostic Pathol*. 2020;15:97.
6. Govender D, Essa AS. Malakoplakia and tuberculosis. *Pathol (Phila)*. 1999;31:280–283.
7. Hamodat M, Naghibi B, Yousef GM. Malakoplakia of the neck in a patient with cancer of the colon. *Can J Surg*. 2009;52:E107–e108.
8. Patel MR, Thammishetti V, Agarwal S, et al. Renal graft malakoplakia masquerading post-transplant lymphoproliferative disorder. *BMJ Case Rep*. 2021:14.
9. Long Jr JP, Althausen AF. Malacoplakia: a 25-year experience with a review of the literature. *J Urol*. 1989;141:1328–1331.
10. Vitkovski T, Costales C, Chen S, et al. Malakoplakia of the thyroid gland: a case report and review of literature. *Int J Surg Pathol*. 2015;23:308–312.
11. Szołkowska M, Langfort R, Szczepulska EM, et al. [Pulmonary malakoplakia and Rhodococcus equi infection. A report of two cases and review]. *Pneumonol Alergol Pol*. 2007;75:398–404.
12. Mannan AA, Sharma MC, Bahadur S. Malacoplakia of the vallecula masquerading as a malignancy. *Ear Nose Throat J*. 2011;90:E17–E19.
13. Flint A, Murad TM. Malakoplakia and malakoplakialike lesions of the upper gastrointestinal tract. *Ultrastruct Pathol*. 1984;7:167–176.
14. Lewis CM, Resto VA, Wu D, et al. Pathology quiz case 2. Diagnosis: malakoplakia of the left tongue base. *Arch Otolaryngol Head Neck Surg*. 2006;132:1159.
15. Gupta AK, Mann SB, Singh KB, et al. Laryngeal malakoplakia. *J Laryngol Otol*. 1997;111:978–979.
16. Mollo JL, Groussard O, Baldeyrou P, et al. Tracheal malacoplakia. *Chest*. 1994;105:608–610.
17. Gabrielides CG, Karkavelas G, Triarides C, et al. Malakoplakia of the larynx. *Pathol Res Pract*. 1981;172:53–57.
18. Nieto-Ríos JF, Ramírez I, Zuluaga-Quintero M, et al. Malakoplakia after kidney transplantation: Case report and literature review. *Transplant Infect Dis*. 2017:19.
19. Hassan NH, Usman R, Yousuf M, et al. Transoral flexible laryngoscope biopsy: Safety and accuracy. *World J Otorhinolaryngol Head Neck Surg*. 2019;5:30–33.
20. Watson K, Carville K, Bowman J, et al. Upper respiratory tract bacterial carriage in Aboriginal and non-Aboriginal children in a semi-arid area of Western Australia. *Pediatr Infect Dis J*. 2006;25:782–790.
21. Zhang Y, Byrnes K, Lam-Himlin D, et al. Gastrointestinal malakoplakia: clinicopathologic analysis of 26 cases. *Am J Surg Pathol*. 2020;44:1251–1258.
22. Matsuda I, Zozumi M, Tsuchida YA, et al. Primary extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue type with malakoplakia in the urinary bladder: a case report. *Int J Clin Experimental Pathol*. 2014;7:5280–5284.
23. Kracke A, Hiller AS, Tschernig T, et al. Larynx-associated lymphoid tissue (LALT) in young children. *Anat Rec*. 1997;248:413–420.
24. Hiller AS, Tschernig T, Kleemann WJ, et al. Bronchus-associated lymphoid tissue (BALT) and larynx-associated lymphoid tissue (LALT) are found at different frequencies in children, adolescents and adults. *Scand J Immunol*. 1998;47:159–162.
25. Mitchell A, Dugas A. Malakoplakia of the colon following renal transplantation in a 73 year old woman: report of a case presenting as intestinal perforation. *Diagn Pathol*. 2019;14:22.
26. Akilesh S, Cross S, Kimmelshue K, et al. Pseudotumor of the tracheal-laryngeal junction with unusual morphologic features caused by Rhodococcus equi infection. *Head Neck Pathol*. 2011;5:395–400.