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ORAL MEDICINE

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Tuberculosis of the head and neck: a review of 20 cases

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Objective. Tuberculosis (TB) of the head and neck is currently a reemerging infectious disease and may be a diagnostic challenge for dental care providers. The aim of the present study was to retrospectively review the clinical features of patients diagnosed with TB of the head and neck during the past 16 years.

Materials and methods. Thirteen male and 7 female patients with TB of the head and neck were histologically identified following surgical biopsy in our department between 1991 and 2007. The medical charts were reviewed.

Results. The age distribution was broad, with 11 patients (55%) older than 50 years and 4 (20%) younger than 10 years old. Thirteen patients had oral lesions and 2 had multiple lesions. The most common oral location was the buccal mucosa and/or vestibule (5 cases), followed by the alveolar mucosa (4 cases), palate (2 cases), lip (2 cases), and tongue (1 case). Seven patients had cervical TB. The predominant clinical manifestation was ulceration. Two patients were found to have coexistent metastatic squamous cell carcinoma. Four patients were identified with active pulmonary lesions and 1 patient with evidence of old pulmonary TB on the 14 chest radiographs available.

Conclusion. Tuberculosis of the head and neck may not be as rare as once thought. We emphasize the importance of early diagnosis in such lesions, especially in slow-to-heal wounds and undiagnosed neck lumps. (*Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009;107:381-386)

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, an acid-fast bacillus that is transmitted primarily through the respiratory tract. Tuberculosis is a global health problem with 8 million people infected annually and 3 million people dying from diseases related to TB complications.^{1,2} The inci-

dence of TB in underdeveloped countries is increasing, and this is thought to be because of associated poor hygiene conditions and the greater prevalence of AIDS.³ In Taiwan in the past 5 years, there have been approximately 8000 to 10,000 people identified with pulmonary TB and 6000 people identified with extrapulmonary TB each year.⁴ In addition, 1000 to 1300 people died from TB each year during this 5-year time period and the disease was ranked as the 13th cause of death in our country.⁴

Tuberculosis chiefly affects the pulmonary system but it can also involve extrapulmonary sites including the head and neck region. Upon reviewing the English-language literature, oral TB has been generally regarded as a rare entity (effecting approximately 0.05% to 5.00% of patients with TB).^{1,5} In this way, this disease rarely features in the differential diagnoses of head and neck lesions. The aim of this study was to retrospectively evaluate the clinical characteristics of head and neck TB lesions in the Oral Pathology Department of a tertiary medical center from 1991 to 2007.

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Table I. Summary of data relating to the 13 patients with oral tuberculosis in the present study

<i>Patient no.*</i>	<i>Year of presentation</i>	<i>Age at diagnosis</i>	<i>Sex</i>	<i>Duration of symptoms</i>	<i>Location</i>	<i>Clinical impression prior to diagnosis</i>	<i>Chest radiograph findings</i>	<i>Classification</i>
1	1991	78	M	1.5mo	Vestibule, lower, left	Squamous cell carcinoma	NA	NA
3	1992	57	M	1 y	Tongue, lateral, right	Squamous cell carcinoma	Free	Primary
5	1995	44	M	1 wk	Buccal and vestibule, right	Squamous cell carcinoma	Active	Secondary
6	1995	7	M	2 mo	Palate, middle	Benign salivary gland tumor	NA	NA
7	2001	36	M	2 wk	Buccal, left	Squamous cell carcinoma	Free	Primary
8†	2002	54	M	1 mo	Vestibule, lower lip, left	Chronic ulcer	Free	Primary
10†	2005	68	F	1 mo	Retromolar, soft palate, right	Ulcerative lesion	Active	Secondary
11	2005	55	F	5 d	Edentulous ridge, left, lower	Ulcer	NA	NA
13	2006	62	M	3 y	Tuberosity, unhealed extraction wound, right	Squamous cell carcinoma	Active	Secondary
14	2006	68	M	1 wk	Buccal, left	Squamous cell carcinoma	Active	Secondary
15	2006	68	M	3 mo	Lower lip, left	Ulcer	NA	NA
16	2007	70	M	3 wk	Edentulous ridge, unhealed extraction wound, left, lower	Squamous cell carcinoma	Free	Primary
18	2007	27	M	2 wk	Lower lip, left	Mucocele	Free	Primary

M, male; F, female; NA: not available.

*Patients have been ordered according to the chronological sequence of presentation during the series.

†Multiple involvement.

MATERIALS AND METHODS

The records of all patients from the Oral Pathology Department at our institution with a histopathologically confirmed diagnosis of TB of the head and neck were surveyed. Twenty cases were identified between January 1991 and December 2007 and reviewed. The criteria for a diagnosis of TB were histopathologic evidence of granulomatous inflammation with epithelioid cells and Langhans giant cells or acid-fast bacilli seen on Ziehl-Nielsen staining of biopsy specimens. The patients' medical records were reviewed for details relating to presenting signs and symptoms, site and appearance of the lesions, chest x-ray findings, and sputum smear and tuberculosis culture results.

RESULTS

Clinical data relating to a total of 20 patients with histopathologically diagnosed TB of the head and neck between 1991 and 2007 in our department is summarized

in Tables I and II. It is noteworthy that 55% (n = 11) of these cases were diagnosed in the past 3 years (2005 to 2007) (Fig. 1). Representative pictures demonstrating the clinical and histopathological appearances of these oral lesions are shown in Figs. 2 and 3. Eleven cases (55%) were 50 years or older and 4 cases (20%) were younger than 10 years old. The age of the patients ranged from 6 to 85 years, with an average age of 45.7 ± 25.8 years (mean \pm SD) and a male to female ratio of approximately 1.86:1.00. The age of the male patients ranged from 7 to 78 years, with an average of 48.8 ± 23.3 years. The age of the female patients ranged from 6 to 85 years, with an average of 39.9 ± 30.7 years. HIV serology data are unavailable for the current patient series.

Oral TB was found in 13 patients (11 males and 2 females, male to female ratio of 5.5:1.0) and 2 patients had multiple oral lesions. Involved oral sites included the buccal mucosa and vestibule (5 cases), alveolar mucosa (4 cases), palate (2 cases), lips (2 cases), and tongue (1 case) (see Table II). Oral TB patients in this

Table II. Summary of data on the 7 patients identified with tuberculosis in the neck

Patient no.*	Presentation time	Age at diagnosis	Sex	Duration of symptoms	Location	Clinical Impression before diagnosis	Chest radiograph findings	Classification
2	1992	6	F	4 mo	Lymph node, submandibular, left	Lymphadenopathy	NA	NA
4	1992	17	F	NA	Lymph node, submandibular, right	Cellulitis, lymphadenopathy	NA	N/A
9	2002	56	M	NA	Neck lymph node, unspecified, right	Squamous cell carcinoma with neck metastasis	Free	Primary
12	2006	85	F	NA	Lymph node, supra-omohyoid, right	Squamous cell carcinoma with neck metastasis	Old TB, no active lesion	Secondary
17	2007	8	F	3 mo	Lymph node, submandibular, right	Benign salivary gland tumor	Free	Primary
19	2007	7	M	3 mo	Lymph node, submental, left	Granuloma	Free	Primary
20	2007	41	F	1 mo	Lymph node, submental, right	Mesenchymal tumor	Free	Primary

M, male; F, female; NA, not available; TB, tuberculosis.

*Patients have been ordered according to the chronological sequence of presentation during the series.

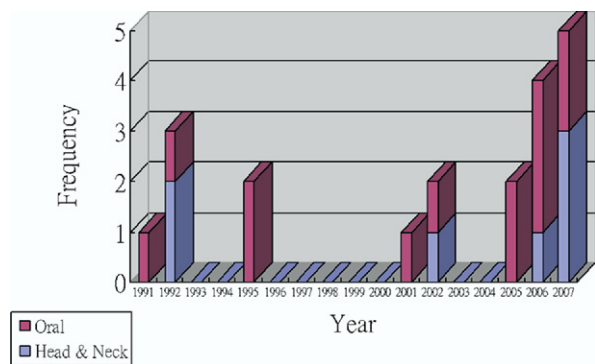


Fig. 1. A total of 11 cases (55% of total in series) of head and neck tuberculosis were diagnosed between 2005 and 2007.

series ranged in age from 7 to 78 years, with an average of 53.4 ± 20.1 years. The age of male oral TB patients ranged from 7 to 78 years, with an average of 51.9 ± 21.5 years. The age of the 2 female patients was 55 and 68 years. Out of the 7 patients with TB lesions in the neck, 5 were female patients giving a male to female ratio of approximately 0.4:1.0. The age of the female patients in this group ranged from 6 to 85 years, with an average of 31.4 ± 33.0 years. The age of the 2 male patients was 7 and 56 years.

The presenting symptoms that were encountered in the patients with oral TB are summarized in order of frequency in Table III. The duration of these symptoms before diagnosis in the 13 patients with oral TB ranged from 5 days to 36 months, with an average of 5.5 ± 11.2 months. Seven of these 13 patients had duration of symptoms more than 1 month. None of the patients complained of malaise or weight loss and only 2 patients complained of fever or pain. The appearance of the affected mucosa in oral TB was variable (see Table III). The most common manifestation was ulceration and/or swelling of the mucosa ($n = 7$), ranging from 1 to 4 cm in diameter and most cases 3 to 4 cm in diameter. Seven of these patients were thought to have squamous cell carcinoma on clinical appearance. Of the patients with TB in the neck, the duration of symptoms was unavailable for 3 patients. The most common clinical sign was swelling ($n = 5$), ranging from 0.5 to 3.0 cm in diameter. It is important to note that 2 patients diagnosed with neck TB were found to have coexisting metastatic cervical lymph node squamous cell carcinoma.

Four patients with active pulmonary lesions and 1 patient with evidence of old pulmonary TB were identified from the 14 available chest radiographs in this patient series. Therefore, there were 9 primary and 5

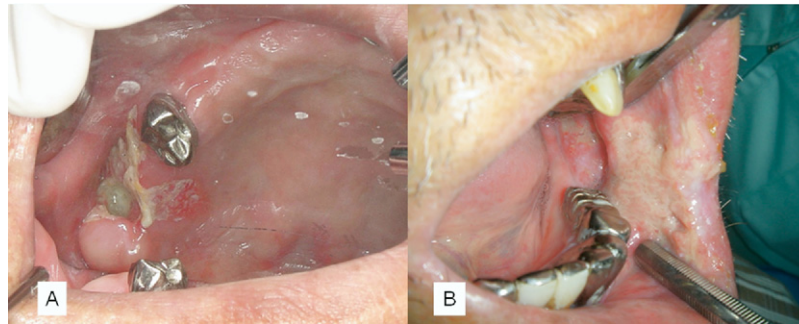


Fig. 2. **A**, Poorly healing socket following dental extraction (case 13). **B**, Extensive buccal ulceration (case 14).

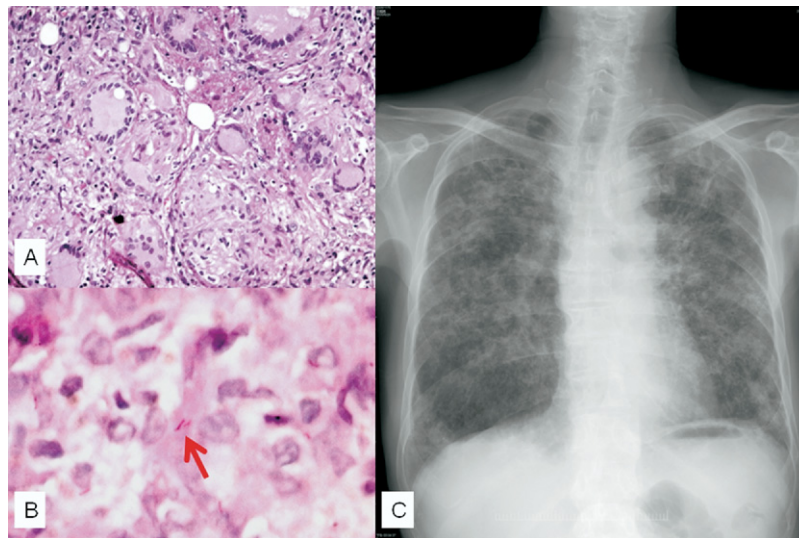


Fig. 3. Histopathologic and chest x-ray findings from case 14. **A**, Numerous epithelioid cells and multiple Langhans giant cells are seen (hematoxylin and eosin, $\times 100$). **B**, Ziehl-Nielsen staining demonstrates acid-fast bacilli (as indicated by red arrow) ($\times 1000$). **C**, Active pulmonary lesion is noted on chest x-ray radiography.

Table III. Presenting symptoms of patients found to have oral TB in the present study

Symptom	No. patients
Ulceration	9
Swelling or mass (not lymph node)	5
Cervical lymphadenitis	3
Fever	2
Focal pain	2
Nonhealing extraction wound	2

secondary TB lesions in this retrospective review (Tables I and II). All 4 patients with active pulmonary TB had concurrent oral lesions. Of the 9 patients thought to have primary TB lesions in the head and neck, 4 had oral lesions and the remaining 5 had neck lesions. Fourteen patients had data relating to sputum examina-

tion; 4 (28.9%) cases grew positive cultures and 7 of 11 cases were positive on Ziehl-Nielsen staining.

All patients in this series were treated with a combination of rifampicin, myambutol, isoniazid, and pyrazinamide for a duration ranging between 4 and 11 months. All oral lesions subsided following adequate medication. Only 1 patient (case 5) did not complete the scheduled treatment and stopped at 4 months when coughing improved. The therapeutic regimen recommenced 15 months later with the recurrence of a pulmonary lesion.

DISCUSSION

Of the 20 patients with TB lesions in the head and neck, it has been noted that 55% ($n = 11$) of the cases in this series were diagnosed in the past 3 years (2005 to 2007). Does this imply that the occurrence of extrapulmonary TB in regions of the head and neck (in-

cluding oral, dental or ear, nose and throat) has become elevated recently? Four cases of secondary oral TB have been identified in this study. Furthermore, although it has been suggested in the past that TB is a more common cause of oral lesions in older patients,⁵⁻⁷ 4 patients younger than 10 years old have been identified in the current patient series. In this way, dental care providers should be aware of the possibility of oral TB in adults and children, especially when associated with concurrent pulmonary lesions.

When an ulcerating oral lesion coexists with palpable lymph nodes and is associated with risk factors such as cigarette smoking, excessive alcohol consumption, and betel-quid chewing, it is clear that the clinical suspicion should remain focused on oral squamous cell carcinoma, as noted in the current study. It has been noted in our oral TB patients that most lesions were located in the anterior portions of the oral cavity such as the buccal mucosa or vestibule area near the corner of the mouth or lower lip. This is consistent with previous observations, such as those by Mignogna and colleagues⁵ and Ito and colleagues.⁶ This is in contrast to the usual location of oral squamous cell carcinoma, such as on the lateral border of the tongue and retro-molar area. Therefore, if such a lesion is identified, especially in children, adolescents or females with no obvious exposure to risk factors for squamous cell carcinoma, oral TB should be considered in the differential diagnosis. Only 4 patients (20%) in the current study had demonstrable radiographic evidence of pulmonary TB. This is in contrast to 2 previous studies by Eng and colleagues⁷ and Penfold and Revington⁸ who reported radiographic evidence of pulmonary TB in 93% of patients with oral TB and 55% of patients with TB lymphadenitis, respectively.

Extrapulmonary TB in the neck was commonly found in the submental and submandibular lymph nodes as well as the salivary glands.⁹⁻¹¹ In our study, 5 of 7 patients with TB lymphadenitis had affected submandibular and submental lymph nodes. Before the TB lesions were identified on histological examination of the lymph node biopsies, all 5 patients complained of toothache and were treated with antibiotics and eventually tooth extraction without improvement. Consequently, if cervical lymphadenitis is identified, we suggest that TB lymphadenitis should be considered and biopsy performed as soon as possible so that the correct diagnosis can be made and the correct therapy can be started without delay. Additionally, Gheriani and colleagues¹² reported on the coexistence of cervical TB and metastatic squamous cell carcinoma within a single lymph node group. In this study, we identified 2 patients with both cervical TB and oral squamous cell carcinoma patients. In 1 case (case 12), the patient had

no symptoms suggestive of TB lymphadenitis and the diagnosis was made surreptitiously on microscopic examination of cervical lymph nodes following radical neck dissection for cancer. In another case (case 9), a neck lymph node began to grow rapidly soon after neck dissection for cancer and was found to be TB infected; this may be because the patient's immunity was hampered after radical surgery and was therefore susceptible to opportunistic infection with the bacilli on contact.

Compared with a previous study of oral TB (1986 to 1990) in a nearby hospital,⁷ the present study (1991 to 2007) has similar findings, such as a predominance of presentations as oral ulcers, the majority being male patients, and most patients being in the fifth decade of life. However, a number of differences are noted including the majority of lesions in the buccal and/or vestibule areas, the presence of pediatric patients, the relatively lower frequency of radiographic evidence of coexistent pulmonary TB, and the presence of fewer associated systemic symptoms. These data provide valuable information on the trend of this disease for dental care providers in the region.

With respect to the route of infection of the bacilli in the oral cavity, it is generally regarded that pulmonary bacilli are transmitted to secondary lesions via lymphatic or hematogenous routes. For primary oral lesions (where there is no evidence of old or current pulmonary TB), the mycobacterium may directly inoculate oral mucosa following minor injury as a result of trauma, inflammatory conditions, or tooth extraction.^{13,14} Neck TB is less infective. If the amount of mycobacterium in an ulcerating oral TB lesion is high enough, there is the possibility that more lesions could be induced and/or disseminated to other individuals via the saliva. Therefore, no matter whether primary or secondary oral TB in nature, early detection, diagnosis, and treatment are of the utmost importance.

In conclusion, TB of the head and neck may not be as uncommon as previously thought. The correct identification and treatment of head and neck lesions (and particularly wounds that are slow to heal and undiagnosed cervical swellings) cannot be overemphasized.

REFERENCES

1. Phelan JA, Jimenez V, Tompkins DC. Tuberculosis. *Dent Clin North Am* 1996;40:327-41.
2. Yepes JF, Sullivan J, Pinto A. Tuberculosis: medical management update. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004;98:267-73.
3. Miziara ID. Tuberculosis affecting the oral cavity in Brazilian HIV-infected patients. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005;100:179-82.
4. Department of Health, Health Statistics in Taiwan Area. Taipei: The Executive Yuan, Taiwan, ROC, 2007.
5. Mignogna MD, Muzio LL, Favia G, Ruoppo E, Sammartino G,

- Zarrelli C, et al. Oral tuberculosis: a clinical evaluation of 42 cases. *Oral Dis* 2000;6:25-30.
6. Ito FA, de Andrade CR, Vargas PA, Jorge J, Lopes MA. Primary tuberculosis of the oral cavity. *Oral Dis* 2005;11:50-3.
 7. Eng HL, Lu SY, Yang CH, Chen WJ. Oral tuberculosis. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1996;81:415-20.
 8. Penfold CN, Revington PJ. A review of 23 patients with tuberculosis of the head and neck. *Br J Oral Maxillofac Surg* 1996;34:508-10.
 9. Papadogeorgakis N, Mylonas AI, Kolomvos N, Angelopoulos AP. Tuberculosis in or near the major salivary glands: report of 3 cases. *J Oral Maxillofac Surg* 2006;64:696-700.
 10. Sethi A, Sareen D, Sabherwal A, Malhotra V. Primary parotid tuberculosis: varied clinical presentations. *Oral Dis* 2006;12:213-5.
 11. Chou YH, Tiu CM, Liu CY, Hong TM, Lin CZ, Chiou HJ, et al. Tuberculosis of the parotid gland: sonographic manifestations and sonographically guided aspiration. *J Ultra Med* 2004;23:1275-81.
 12. Gheriani H, Hafidh M, Smyth D, O' Dwyer T. Coexistent cervical tuberculosis and metastatic squamous cell carcinoma in a single lymph node group: a diagnostic dilemma. *Ear Nose Throat J* 2006;85:397-9.
 13. Manolidis S, Frenkiel S, Yoskovitch A, Black M. Mycobacterial infections of the head and neck. *Otolaryngol Head Neck Surg* 1993;109:427-33.
 14. Florio S, Ellis E 3rd, Frost DE. Persistent submandibular swelling after tooth extraction. *J Oral Maxillofac Surg* 1997;55:390-7.
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