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**Relevance on the diagnosis of malignant lymphoma of the salivary gland**

Zhang XY *et al*. Malignant lymphoma/salivary gland

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**Abstract**

Malignant lymphoma originates from the lymphohematopoietic system. It can occur in any lymphoid tissue. Malignant lymphoma of the salivary gland is rare, but its incidence has increased in recent years. Its clinical- presentations are non-specific, and it is often manifested as a painless mass in a salivary gland, which can be accompanied by multiple swollen cervical lymph nodes. Confirmation of the diagnosis before an invasive procedure is difficult. Clinically, malignant lymphoma of the salivary gland tends to be misdiagnosed, leading to an inappropriate treatment plan and the ultimate delay in the optimal treatment of the disease. This article reviews the pathogenesis, clinical features, imaging findings, diagnosis, treatment and prognosis of malignant lymphoma of the salivary gland.

**Key words:** Salivary gland; Malignant lymphoma; Pathogenic factors; Clinical features; Diagnosis; Treatment

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**Core tip:**  Salivary gland lymphoma (SGL) is rare, and it is often manifested as a painless mass in a salivary gland, with or without multiple swollen cervical lymph nodes. Clinically, SGL tends to be misdiagnosed as other epithelial tumors of the salivary gland, leading to an inappropriate surgical excision and delay in the optimal treatment of the disease. This article reviews the pathogenesis, clinical features, imaging findings, diagnosis, treatment and prognosis of SGL.

**INTRODUCTION**

Lymphoma is a malignant tumor originating from the lymphohematopoietic system. It is a group of diseases with extensive clinical and histological features, genetic abnormalities, and immunophenotypes. Lymphomas account for 3% - 4% of malignant tumors and is the most common head and neck malignancy after squamous cell carcinoma and thyroid cancer[1-4]. Lymphoma can be divided into two major histopathological entities, Hodgkin lymphoma (HL) and non-HL (NHL), and can be subdivided into intranodal and extranodal types according to its origination inside or outside a lymph node. The majority of oral and maxillofacial lymphomas are extranodal NHLs[5]. Head-and-neck NHLs can originate in any lymphoid tissue, most commonly in Waldeyer's ring, the nasal cavity, nasal sinuses, oral cavity, and salivary glands[6,7]. An NHL originating from a salivary gland is rare, accounting for only 1.7% - 3.1% of all salivary gland malignant tumors[8,9]. Most NHLs involving the salivary glands originate from B cells, with the most common location being the parotid glands, followed by the submandibular glands, minor salivary glands, and sublingual glands, in descending order[8-11]. Salivary gland lymphoma (SGL) is a diverse tumor with nonspecific clinical features and imaging manifestations. Therefore, differentiating it from other epithelial tumors of the salivary gland is difficult.

Because of the complicated histopathological classification of NHLs, the gold standard for the diagnosis and determination of the subtype of this disease is an incisional biopsy of the deep portion of tumor[12]. The complexity of the diagnostic process can lead to a misdiagnosis or a delayed diagnosis[10]. Because the treatment for SGL is different from the treatment for an epithelial tumor of the salivary gland and lymphomas in other parts, a misdiagnosis or delayed diagnosis may lead to an inappropriate treatment plan, affecting the outcome of the patients.

A primary SGL is thought to involve the parenchyma of the salivary gland, rather than being confined to soft tissue or a regional lymph node, and no lymphomatous lesion was detected in other parts of the body before diagnosis[13]. In view of the diagnostic difficulties for primary salivary gland lymphomas, we researched 944 articles about malignant lymphoma of the salivary gland published in PubMed from 2000 to December 2019 in English. Some of the articles were excluded because they were not primarily originated from the salivary gland tissue. Among them, 344 articles involved the research on the primary salivary gland lymphoma, including 102 case reports. In addition, the data from articles other than case reports was not concrete concerning the clinical information, so we finally selected 16 case reports, and the detailed data are listed in Table 1[13-28]. This article analyzes the pathogenesis, clinical features, imaging findings, diagnosis, treatment, and prognosis of primary SGL.

**PATHOGENTIC FACTORS**

The incidence of SGL has recently shown an upward trend. Epidemiological investigations show that the main causative factors of malignant lymphoma include infection and changes in immune function. Genetic factors, occupational and environmental factors, diet, smoking, alcohol, and socioeconomic status are also involved.

***Viral infections***

The prevalence of NHL in human immunodeficiency virus (HIV)-infected people is almost twice that in the general population[12,29,30]. HIV infection is believed to be associated with lymphomagenesis primarily due to the immunosuppressed state of the patient rather than mechanisms involving the virus *per se*[31]. The development of AIDS-related NHL is caused by long-term administration of HIV-related immunostimulant leading to the proliferation of B lymphocytes[12,32]. The parotid gland is the most common location of SGL in HIV patients[33].

Epstein-Barr virus (EBV) is associated with a variety of malignant lymphomas, including Burkitt lymphoma, HL, and BHL[34]. EBV is a herpes virus that can infect B and T lymphocytes, natural killer cells, epithelial cells, and myocytes[35,36]. Antibodies to EBV are detectable in more than 90% of the normal adult population. Because the immune system can be unsuccessful in controlling EBV-induced cellular proliferation, the infected cells can transform into malignant cells[37]. Therefore, EBV-related NHLs are more common in immunosuppressed populations, especially those infected with HIV[36,38].

Many epidemiological studies have provided evidence that hepatitis C virus (HCV) infection is associated with the development of indolent and aggressive B-cell lymphomas[39-41]. HCV-infected patients may develop lymphomas that are either independent of viral infection or result from indirect activation of B cells by the virus[42]. Investigators have proposed several mechanisms for HCV-induced lymphomagenesis. These mainly include the chronic viral stimulation of lymphocytes and HCV replication in B cells, which is mediated by the interaction of HCV envelope proteins with lymphocyte-specific glycoproteins[42-44].

***Helicobacter pylori infection***

Mucosa-associated lymphoid tissue (MALT) lymphoma is an extranodal marginal-zone B-cell lymphoma[45], and is the third most common subtype of NHL after diffuse large B-cell lymphoma (DLBCL) and follicular lymphoma (FL). It exhibits an indolent behavior[46,47]. Although gastric MALT is most common, it can develop in almost every organ and tissue, including the salivary gland, thyroid gland, thymus, skin, and orbital adnexa[47-49]. *Helicobacter pylori* (*H**. pylori*) infection is thought to play a key role in the development of gastric MALT lymphoma[50]. Normal gastric mucosa and salivary glands do not contain lymphoid tissue, but the long-term exposure to microbial antigens in a chronic inflammatory disease can lead to increased lymphoid tissue[51,52]. Similar to gastric MALT, chronic gastritis associated with *H. pylori* infection confers a significantly increased risk of SGL[49,50,53].

***Immunosuppression***

Factors associated with immunosuppression are linked with an increased risk of lymphoid malignancies[7,31]. Primary or secondary immunosuppression and autoimmunity are associated with NHLs[54,55]. Autoimmune conditions have attracted substantial attention; Sjögren syndrome (SS), systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), and immunosuppressive therapy for solid organ or stem cell transplantation are frequently associated with increased risk of NHL[31,54,56].

SS is characterized by lymphocytic infiltration and destruction primarily of salivary and lacrimal glands, which leads to xerostomia and xeropthalmia, respectively. Among the salivary glands, the parotid and submandibular glands are primarily affected[26,57]. According to a meta-analysis of 20 studies, SS presents a higher risk factor for development of NHL than SLE and RA[57]. The main risk factor for death in patients with SS is thought to be lymphoma[58]. There is evidence that the occurrence of lymphoma in SS patients is related to ectopic germinal center-like structures in salivary gland biopsy tissue[56]. Moreover, the structures are connected with elevated levels of numerous chemokines, including C-X-C motif chemokine ligand 13 and C-C motif chemokine ligand 11, the levels of which were significantly elevated in patients with SS-associated SGL[56,59-61].

**CLINICAL FEATURES AND PRESENTATIONS**

Clinical presentations of SGL are nonspecific[1-3], so that a routine clinical examination cannot differentiate them from other benign or malignant salivary gland tumors[15]. The disease affects both genders equally. The mean age of patients is generally older than 50 years[62]. Patients with primary lymphoma of the parotid gland generally present with a unilateral asymptomatic mass that enlarges over a period of time. Other manifestations include bilateral swelling of the parotids, cervical lymphadenopathy, pain, and facial nerve paralysis[15,63-65]. The tumor appears as a border-clear, medium-texture mass, and even presents with superficial ulcers when inflammation is present[65]. Lymphomas occasionally cause diffuse swelling of parotid gland region similar to mumps[64]. Unilateral or bilateral glands may present enlargement if lymphomas occur in the submandibular glands, with hypoglossal nerve and mandibular margin branches of the facial nerve being rarely involved[66,67]. The most frequent location of lymphomas of the minor salivary glands is the hard palate[68]. They can initially appear as a nontender diffuse mass protruding from the mucosal surface, and are sometimes accompanied by ulceration and pain[21,68]. NHL occurring in the sublingual glands is extremely rare. It can be manifested as a diffuse swelling of the floor of the mouth with indistinct boundaries, and is easily misdiagnosed as a cyst of the sublingual gland[69].

**IMAGING MANIFESTATIONS**

Lymphomas of the parotid glands are more common than SGL. Therefore, we reviewed the imaging characteristics of lymphomas of the parotid glands and synthesized information from the literature. The initial evaluation for a mass involving the parotid gland should include ultrasound, computed tomography (CT), or magnetic resonance imaging (MRI) to determine the location, shape, size, and intensity of the mass. The literature indicates that the CT and MRI findings of MALT lymphoma of the parotid gland include variations in the contours and internal structures of the masses, as follows: solitary solid mass, solitary solid-cystic mass, diffusely solid-cystic lesion, and multiple solid nodules or masses, in which solitary and diffusely solid-cystic changes are more common[70,71]. Non-MALT lymphomas of the parotid gland are characterized mainly as solitary lesions, usually accompanied by enlarged and fused cervical lymph nodes. They are also characterized as well-defined masses of uniform density with necrotic areas within the tumor matrix[1,70,71]. MRI features of lymphomas of the parotid gland generally include masses with homogeneous intermediate-signal intensity and an enhancing rim on the postcontrast T1-weighted images and low-signal intensity on the T2-weighted images without obvious enhancement effects[64,71].

**HISTOPATHOLOGY AND CLINICAL STAGES OF SGL**

The definitive histopathological diagnosis and final classification of malignant lymphomas depend on histopathological examinations combined with immunohistochemical staining. B cell non-Hodgkin's SGL is predominant, it can be of any histopathological classification, though[10,45]. The common subtypes of lymphomas of the salivary glands include MALT lymphoma, DLBCL, and FL. T-cell types and HL are rare[11]. Based on the natural course of the disease, SGL can also be divided into aggressive and indolent types, among which DLBCL is aggressive and MALT lymphoma and FL are indolent[46,47]. Clinical staging is generally determined according to the Ann Arbor staging system, and is aided by Positron emission tomography-CT (PET-CT) and the evaluation of a bone marrow biopsy[15,72].

**DIAGNOSTIC APPROACHES**

Attention should be paid to the differential diagnosis of a SGL when the rapidly growing, painless mass occurs in a salivary gland, and especially if multiple cervical lymph nodes are involved. Imaging studies can indicate whether or not the mass involves a salivary gland but do not aid in the histological classification[13]. The gold standard for diagnosis is histopathological examination of a specimen combined with immunohistochemical staining[12,73].

Fine needle aspiration cytology (FNAC) has recently become the method of choice for salivary gland tumors, because an FNA is safe, easy-to-perform, quick, repeatable, and without risk of seeding tumors along the needle tract. Data from the literature indicates that the overall sensitivity, specificity, and accuracy of FNAC for lesions of the oral cavity and salivary glands are 89.5%, 100% and 85%, respectively[73]. Since FNAC provides morphological findings on individual and small group of cells aspirated by a fine needle[74], it can lead to a false-negative diagnosis of lymphoma. Fakhry *et al*[75] studied the diagnostic value of FNAC for 249 parotid tumors and obtained false-negative results for 11 cases (7.7%), among which lymphoma was the most common histological type. The high false-negative diagnostic rate of FNAC for lymphoma is due to the low sensitivity of FNAC, particularly for cystic tumors and/or tumors situated deep in salivary gland parenchyma. The review of the literature revealed that the diagnostic accuracy of FNA is affected by both the inadequate cellularity of the smears and inadequate sampling of the lesions[76]. In addition, morphological analysis is a difficult method for accurate identification of the histological subtypes of NHL of the salivary gland[13,73,74]. In conclusion, an excisional biopsy of the lesion is the most important approach for the diagnosis of SGL.

In addition, 18F-fluorodeoxyglucose (18F-FDG) PET/CT is an important noninvasive means for the diagnosis and staging of NHLs[77]. It provides both structural and functional metabolic information while localizing and estimating the tumor burden[78]. The diagnostic accuracy of 18F-FDG PET/CT depends on the avidity of tumors for 18F-FDG, which varies for different histological subtypes, regardless of grade[77,79]. The literature review revealed that invasive lymphoma subtypes have high 18F-FDG avidity; therefore, 18F-FDG PET/CT is the current reference standard for the staging of invasive lymphomas[77,79]. By contrast, the sensitivity of 18F-FDG PET/CT for indolent lymphomas is not high[77,78,80]. Since 18F-FDG PET/CT leads to a substantial dose of ionizing radiation, whole-body (WB)-MRI has been proposed as the radiation-free imaging technique of choice for the staging of indolent lymphomas with low 18F-FDG avidity[78]. Even so, 18F-FDG PET/CT remains the reference standard for the staging of HL and invasive NHL. WB-MRI tends to underestimate the response of the tumor to treatment. Multicenter prospective studies are needed to further confirm the role of WB-MRI in staging SGL[78,79].

Small clonal B-cell populations, which is also known as monoclonal B-cell lymphocytosis, has been found to be associated with occult SGL. However, the evaluation of monoclonal B-cell lymphocytosis in bone marrow has been mainly used for staging the lymphoma or monitoring the response to treatment[80].

**TREATMENT AND PROGNOSIS**

The treatment of SGL depends on the histopathological classification of the lesion, which leads to an individualized treatment plan. The treatment is generally nonsurgical, depending mainly on chemotherapy, radiation, or both[15]. Aggressive lymphomas such as DLBCL of the salivary gland are presumed to be disseminated disease. The suggested treatment is systemic chemotherapy and rituximab[15]. The standard treatment of DLBCL is rituximab with cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP)[81]. However, there remains room for improvement, particularly for elderly patients and patients with advanced or recurrent DLBCL[82]. Wilson *et al*[83] studied the regimen consisting of dose-adjusted etoposide, prednisone, vincristine, cyclophosphamide, and doxorubicib plus rituximab (R-DA-EPOCH), which might be better than R-CHOP.

FL and MALT are two common subtypes of indolent NHL of the salivary glands. Radiotherapy is often applied for the treatment for indolent NHL of the salivary glands, and the standard dose range is normally between 20 and 30 Gy[84]. 24 Gy is the curative dose for early stages of MALT, which could minimize toxicity[85]. But anti-infection treatment is required if the MALT is associated with *H. pylori* infection[86,87]. A watch-and-wait approach is often recommended by the treatment guidelines for patients with low-grade FL of the salivary glands who are asymptomatic at the time of diagnosis[88]. In patients with advanced indolent lymphomas including MALT and FL, bendamustine plus rituximab (BR) can be considered as a preferred first-line treatment regimen over R-CHOP[86,89]. However, FL can transform into DLBCL, and is expected to behave more like DLBCL. Therefore, the World Health Organization classification recommends that FL should be treated with the same regimen that is used for DLBCL[86]. For recurrent and refractory indolent or aggressive lymphomas, autologous hematopoietic stem-cell transplantation is usually used in combination with high-dose chemotherapy[90].

The evaluations of response include complete remission (CR), partial remission (PR), and progression of disease (PD). CR has been defined as the complete disappearance of signs and symptoms due to lymphoma for at least 6 wk. PR has been defined as a reduction of at least 50% of the product of the largest perpendicular diameters of all measurable lesions for a duration of at least 6 wk. PD has been defined as clear evidence of advancing disease, despite continuation of the treatment[91]. WB metabolic tumor volume (MTV) is a new metric derived from 18F-FDG PET/CT to predict response to therapy and outcomes in patients with lymphomas, especially aggressive NHL. MTV is a volume parameter that can be quantitatively measured. The most common method to measure MTV is the fixed threshold method, where the optimal threshold is standard uptake value (SUV) 3 or SUV 6. The risk of disease progression increases with higher value of MTV[92].

**CONCLUSION**

Primary SGL with or without cervical masses is an uncommon tumor. Most lymphomas of the salivary gland are B-cell NHLs, including mainly MALT, DLBCL, and FL. The gold standard for diagnosis is the excisional biopsy combined with histopathological examination and immunohistochemical staining. The optimal treatment is chemotherapy or radiotherapy instead of complete surgical excision. At present, R-DA-EPOCH and BR have been widely recommended. The overall survival rate for patients with NHL of the salivary gland is usually higher than for patients with lymphomas originating from other extranodal sites. The prognosis of patients with lymphomas involving the salivary glands depends on the pathological subtypes and staging. Generally, patients with MALT and FL have a much better prognosis than patients with DLBCL. 18F-FDG PET/CT is frequently used for monitoring the patients during the post-treatment period. Regular follow-ups could improve the survival rates of patients with SGL.

**REFERENCES**

1 **Weber AL**, Rahemtullah A, Ferry JA. Hodgkin and non-Hodgkin lymphoma of the head and neck: clinical, pathologic, and imaging evaluation. *Neuroimaging Clin N Am* 2003; **13**: 371-392 [PMID: 14631680 DOI: 10.1016/s1052-5149(03)00039-x]

2 **Vega F**, Lin P, Medeiros LJ. Extranodal lymphomas of the head and neck. *Ann Diagn Pathol* 2005; **9**: 340-350 [PMID: 16308165 DOI: 10.1016/j.anndiagpath.2005.09.020]

3 **Storck K**, Brandstetter M, Keller U, Knopf A. Clinical presentation and characteristics of lymphoma in the head and neck region. *Head Face Med* 2019; **15**: 1 [PMID: 30606206 DOI: 10.1186/s13005-018-0186-0]

4 **Cooper JS**, Porter K, Mallin K, Hoffman HT, Weber RS, Ang KK, Gay EG, Langer CJ. National Cancer Database report on cancer of the head and neck: 10-year update. *Head Neck* 2009; **31**: 748-758 [PMID: 19189340 DOI: 10.1002/hed.21022]

5 **Torjussen W**, Holt GL. [Non-Hodgkin lymphoma in the head and neck region]. *Tidsskr Nor Laegeforen* 2002; **122**: 1098-1100 [PMID: 12043052]

6 **Salplahta D**, Comănescu MV, Anghelina F, Ioniţă E, Mogoantă CA, Anghelina L. Non-Hodgkin lymphomas of Waldeyer's ring. *Rom J Morphol Embryol* 2012; **53**: 1057-1060 [PMID: 23303032]

7 **Raut A**, Huryn J, Pollack A, Zlotolow I. Unusual gingival presentation of post-transplantation lymphoproliferative disorder: a case report and review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2000; **90**: 436-441 [PMID: 11027379 DOI: 10.1067/moe.2000.107446]

8 **Jamal B**. Treatment of Parotid Non-Hodgkin Lymphoma: A Meta-Analysis. *J Glob Oncol* 2018; **4**: 1-6 [PMID: 30241143 DOI: 10.1200/JGO.17.00071]

9 **Wolvius EB**, van der Valk P, van der Wal JE, van Diest PJ, Huijgens PC, van der Waal I, Snow GB. Primary non-Hodgkin's lymphoma of the salivary glands. An analysis of 22 cases. *J Oral Pathol Med* 1996; **25**: 177-181 [PMID: 8809686 DOI: 10.1111/j.1600-0714.1996.tb00216.x]

10 **Etemad-Moghadam S**, Tirgary F, Keshavarz S, Alaeddini M. Head and neck non-Hodgkin's lymphoma: a 20-year demographic study of 381 cases. *Int J Oral Maxillofac Surg* 2010; **39**: 869-872 [PMID: 20538427 DOI: 10.1016/j.ijom.2010.03.029]

11 **Dunn P**, Kuo TT, Shih LY, Lin TL, Wang PN, Kuo MC, Tang CC. Primary salivary gland lymphoma: a clinicopathologic study of 23 cases in Taiwan. *Acta Haematol* 2004; **112**: 203-208 [PMID: 15564732 DOI: 10.1159/000081273]

12 **Neerupakam M**, Prakash J, Koduri S, Vishnubhatla T. Non-Hodgkin's Lymphoma of the mandible in HIV patient - A Rare Case Report. *Contemp Clin Dent* 2018; **9**: 110-113 [PMID: 29599595 DOI: 10.4103/ccd.ccd\_543\_17]

13 **Andola SK**, Masgal MM, Reddy RM. Diffuse large B-cell lymphoma of the parotid gland: Cytological, histopathological, and immunohistochemical features: A rare case report. *J Cytol* 2016; **33**: 226-228 [PMID: 28028340 DOI: 10.4103/0970-9371.190441]

14 **Hwang JH**, Kim DW, Kim KS, Lee SY. Mucosa-associated lymphoid tissue lymphoma of the accessory parotid gland presenting as a simple cheek mass: A case report. *Medicine (Baltimore)* 2019; **98**: e17042 [PMID: 31490395 DOI: 10.1097/MD.0000000000017042]

15 **Shum JW**, Emmerling M, Lubek JE, Ord RA. Parotid lymphoma: a review of clinical presentation and management. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2014; **118**: e1-e5 [PMID: 24405648 DOI: 10.1016/j.oooo.2013.10.013]

16 **Choi J**, Choi HJ, Yim K, Kwon H, Byeon JH, Jung SN. Pediatric follicular lymphoma of the parotid gland. *Arch Craniofac Surg* 2018; **19**: 279-282 [PMID: 30613090 DOI: 10.7181/acfs.2018.02075]

17 **Alnoor F**, Gandhi JS, Stein MK, Gradowski JF. Follicular Lymphoma Diagnosed in Warthin Tumor: A Case Report and Review of the Literature. *Head Neck Pathol* 2020; **14**: 386-391 [PMID: 31183747 DOI: 10.1007/s12105-019-01045-x]

18 **Romero M**, González-Fontal GR, Duarte M, Saavedra C, Henao-Martínez AF. Small clonal B-cell population in the bone marrow as a possible tool in the diagnosis of occult primary parotid lymphoma. *Colomb Med (Cali)* 2016; **47**: 59-62 [PMID: 27226666]

19 **Park CK**, Manning JT Jr, Battifora H, Medeiros LJ. Follicle center lymphoma and Warthin tumor involving the same anatomic site. Report of two cases and review of the literature. *Am J Clin Pathol* 2000; **113**: 113-119 [PMID: 10631864 DOI: 10.1309/MJH0-RQGX-U128-VFC6]

20 **Yang X**, Min X, He W. Sequential development of multifocal recurrent non-Hodgkin's lymphoma of mucosa-associated lymphoid tissue and diffuse large B-Cell lymphoma in a single patient: A case report. *Medicine (Baltimore)* 2018; **97**: e10845 [PMID: 29794780 DOI: 10.1097/MD.0000000000010845]

21 **Yonal-Hindilerden I**, Hindilerden F, Arslan S, Turan-Guzel N, Dogan IO, Nalcaci M. Primary B-Cell Mucosa-Associated Lymphoid Tissue Lymphoma of the Hard Palate and Parotid Gland: Report of One Case and Review of the Literature. *J Clin Med Res* 2016; **8**: 824-830 [PMID: 27738485 DOI: 10.14740/jocmr2733w]

22 **Shashidara R**, Prasad PR, Jaishankar, Joseph T. Follicular lymphoma of the submandibular salivary gland. *J Oral Maxillofac Pathol* 2014; **18**: S163-S166 [PMID: 25364171 DOI: 10.4103/0973-029X.141382]

23 **Faur A**, Lazăr E, Cornianu M, Dema A, Lăzureanu C, Mureşan A, Tăban S. Primary malignant non-Hodgkin's lymphomas of salivary glands. *Rom J Morphol Embryol* 2009; **50**: 693-699 [PMID: 19942968]

24 **Alves CAF**, de Gouveia MM, Queiroz AGDS, Brozoski MA, Otoch JP, de Alcântara PSM, de Lima PP, Felipe-Silva A. Nodular lymphocyte predominance Hodgkin lymphoma of the parotid gland: a case report. *Autops Case Rep* 2012; **2**: 43-47 [PMID: 31528561 DOI: 10.4322/acr.2012.007]

25 **Revanappa MM**, Sattur AP, Naikmasur VG, Thakur AR. Disseminated non-Hodgkin's lymphoma presenting as bilateral salivary gland enlargement: a case report. *Imaging Sci Dent* 2013; **43**: 59-62 [PMID: 23525854 DOI: 10.5624/isd.2013.43.1.59]

26 **Titsinides S**, Nikitakis N, Piperi E, Sklavounou A. MALT Lymphoma of Minor Salivary Glands in a Sjögren's Syndrome Patient: a Case Report and Review of Literature. *J Oral Maxillofac Res* 2017; **8**: e5 [PMID: 28496965 DOI: 10.5037/jomr.2017.8105]

27 **Van Mello NM**, Pillemer SR, Tak PP, Sankar V. B cell MALT lymphoma diagnosed by labial minor salivary gland biopsy in patients screened for Sjögren's syndrome. *Ann Rheum Dis* 2005; **64**: 471-473 [PMID: 15708896 DOI: 10.1136/ard.2004.022707]

28 **Hew WS**, Carey FA, Kernohan NM, Heppleston AD, Jackson R, Jarrett RF. Primary T cell lymphoma of salivary gland: a report of a case and review of the literature. *J Clin Pathol* 2002; **55**: 61-63 [PMID: 11825927 DOI: 10.1136/jcp.55.1.61]

29 **Groot RH**, van Merkesteyn JP, Bras J. Oral manifestations of non-Hodgkin's lymphoma in HIV-infected patients. *Int J Oral Maxillofac Surg* 1990; **19**: 194-196 [PMID: 2120356 DOI: 10.1016/s0901-5027(05)80387-x]

30 **Beral V**, Peterman T, Berkelman R, Jaffe H. AIDS-associated non-Hodgkin lymphoma. *Lancet* 1991; **337**: 805-809 [PMID: 1672911 DOI: 10.1016/0140-6736(91)92513-2]

31 **Smedby KE**, Ponzoni M. The aetiology of B-cell lymphoid malignancies with a focus on chronic inflammation and infections. *J Intern Med* 2017; **282**: 360-370 [PMID: 28875507 DOI: 10.1111/joim.12684]

32 **Pastore C**, Gaidano G, Ghia P, Fassone L, Cilia AM, Gloghini A, Capello D, Buonaiuto D, Gonella S, Roncella S, Carbone A, Saglio G. Patterns of cytokine expression in AIDS-related non-Hodgkin's lymphoma. *Br J Haematol* 1998; **103**: 143-149 [PMID: 9792301 DOI: 10.1046/j.1365-2141.1998.00927.x]

33 **Oishi N**, Bagán JV, Javier K, Zapater E. Head and Neck Lymphomas in HIV Patients: a Clinical Perspective. *Int Arch Otorhinolaryngol* 2017; **21**: 399-407 [PMID: 29018505 DOI: 10.1055/s-0036-1597825]

34 **Kikuchi K**, Inoue H, Miyazaki Y, Ide F, Kojima M, Kusama K. Epstein-Barr virus (EBV)-associated epithelial and non-epithelial lesions of the oral cavity. *Jpn Dent Sci Rev* 2017; **53**: 95-109 [PMID: 28725300 DOI: 10.1016/j.jdsr.2017.01.002]

35 **Grywalska E**, Markowicz J, Grabarczyk P, Pasiarski M, Roliński J. Epstein-Barr virus-associated lymphoproliferative disorders. *Postepy Hig Med Dosw (Online)* 2013; **67**: 481-490 [PMID: 23752600 DOI: 10.5604/17322693.1050999]

36 **Hong B**, Petrosyan V, Kruger AR. Unusual Presentation of Epstein-Barr Virus-Positive Diffuse Large B-Cell Non-Hodgkin Lymphoma of the Elderly. *J Oral Maxillofac Surg* 2016; **74**: 1180.e1-1180.e7 [PMID: 26850867 DOI: 10.1016/j.joms.2016.01.002]

37 **Roschewski M**, Wilson WH. EBV-associated lymphomas in adults. *Best Pract Res Clin Haematol* 2012; **25**: 75-89 [PMID: 22409825 DOI: 10.1016/j.beha.2012.01.005]

38 **Westmoreland KD**, Stanley CC, Montgomery ND, Kaimila B, Kasonkanji E, El-Mallawany NK, Wasswa P, Mtete I, Butia M, Itimu S, Chasela M, Mtunda M, Chikasema M, Makwakwa V, Kampani C, Dhungel BM, Sanders MK, Krysiak R, Tomoka T, Liomba NG, Dittmer DP, Fedoriw Y, Gopal S. Hodgkin lymphoma, HIV, and Epstein-Barr virus in Malawi: Longitudinal results from the Kamuzu Central Hospital Lymphoma study. *Pediatr Blood Cancer* 2017; **64** [PMID: 27781380 DOI: 10.1002/pbc.26302]

39 **Mele A**, Pulsoni A, Bianco E, Musto P, Szklo A, Sanpaolo MG, Iannitto E, De Renzo A, Martino B, Liso V, Andrizzi C, Pusterla S, Dore F, Maresca M, Rapicetta M, Marcucci F, Mandelli F, Franceschi S. Hepatitis C virus and B-cell non-Hodgkin lymphomas: an Italian multicenter case-control study. *Blood* 2003; **102**: 996-999 [PMID: 12714514 DOI: 10.1182/blood-2002-10-3230]

40 **Carbone A**, Gloghini A. Relationships between lymphomas linked to hepatitis C virus infection and their microenvironment. *World J Gastroenterol* 2013; **19**: 7874-7879 [PMID: 24307781 DOI: 10.3748/wjg.v19.i44.7874]

41 **Marcucci F**, Mele A. Hepatitis viruses and non-Hodgkin lymphoma: epidemiology, mechanisms of tumorigenesis, and therapeutic opportunities. *Blood* 2011; **117**: 1792-1798 [PMID: 20959600 DOI: 10.1182/blood-2010-06-275818]

42 **Quinn ER**, Chan CH, Hadlock KG, Foung SK, Flint M, Levy S. The B-cell receptor of a hepatitis C virus (HCV)-associated non-Hodgkin lymphoma binds the viral E2 envelope protein, implicating HCV in lymphomagenesis. *Blood* 2001; **98**: 3745-3749 [PMID: 11739181 DOI: 10.1182/blood.v98.13.3745]

43 **Hosry J**, Miranda RN, Samaniego F, Economides MP, Torres HA. Clinicopathologic characteristics and outcomes of transformed diffuse large B-cell lymphoma in hepatitis C virus-infected patients. *Int J Cancer* 2018; **142**: 940-948 [PMID: 29047108 DOI: 10.1002/ijc.31110]

44 **Peveling-Oberhag J**, Arcaini L, Hansmann ML, Zeuzem S. Hepatitis C-associated B-cell non-Hodgkin lymphomas. Epidemiology, molecular signature and clinical management. *J Hepatol* 2013; **59**: 169-177 [PMID: 23542089 DOI: 10.1016/j.jhep.2013.03.018]

45 **Zhang T**, Wu Y, Ju H, Meng J, Guo W, Ren G. Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue in the oromaxillofacial head and neck region: A retrospective analysis of 105 patients. *Cancer Med* 2020; **9**: 194-203 [PMID: 31733094 DOI: 10.1002/cam4.2681]

46 **Thieblemont C**, Berger F, Dumontet C, Moullet I, Bouafia F, Felman P, Salles G, Coiffier B. Mucosa-associated lymphoid tissue lymphoma is a disseminated disease in one third of 158 patients analyzed. *Blood* 2000; **95**: 802-806 [PMID: 10648389]

47 **Anacak Y**, Miller RC, Constantinou N, Mamusa AM, Epelbaum R, Li Y, Calduch AL, Kowalczyk A, Weber DC, Kadish SP, Bese N, Poortmans P, Kamer S, Ozsahin M. Primary mucosa-associated lymphoid tissue lymphoma of the salivary glands: a multicenter Rare Cancer Network study. *Int J Radiat Oncol Biol Phys* 2012; **82**: 315-320 [PMID: 21075560 DOI: 10.1016/j.ijrobp.2010.09.046]

48 **Witkowska M**, Smolewski P. Helicobacter pylori infection, chronic inflammation, and genomic transformations in gastric MALT lymphoma. *Mediators Inflamm* 2013; **2013**: 523170 [PMID: 23606792 DOI: 10.1155/2013/523170]

49 **Mazloom A**, Rodriguez A, Ha CS, Medeiros LJ, Wogan C, Shihadeh F, Allen P, Fowler N, Dabaja B. Incidence of gastric involvement in patients with nongastrointestinal extranodal marginal zone lymphoma. *Cancer* 2011; **117**: 2461-2466 [PMID: 24048794 DOI: 10.1002/cncr.25808]

50 **Nishimura M**, Miyajima S, Okada N. Salivary gland MALT lymphoma associated with Helicobacter pylori infection in a patient with Sjögren's Syndrome. *J Dermatol* 2000; **27**: 450-452 [PMID: 10935342 DOI: 10.1111/j.1346-8138.2000.tb02204.x]

51 **Hauer AC**, Finn TM, MacDonald TT, Spencer J, Isaacson PG. Analysis of TH1 and TH2 cytokine production in low grade B cell gastric MALT-type lymphomas stimulated in vitro with Helicobacter pylori. *J Clin Pathol* 1997; **50**: 957-959 [PMID: 9462249 DOI: 10.1136/jcp.50.11.957]

52 **Raderer M**, Streubel B, Wöhrer S, Häfner M, Chott A. Successful antibiotic treatment of Helicobacter pylori negative gastric mucosa associated lymphoid tissue lymphomas. *Gut* 2006; **55**: 616-618 [PMID: 16299027 DOI: 10.1136/gut.2005.083022]

53 **Berrebi D**, Lescoeur B, Faye A, Faure C, Vilmer E, Peuchmaur M. MALT lymphoma of labial minor salivary gland in an immunocompetent child with a gastric Helicobacter pylori infection. *J Pediatr* 1998; **133**: 290-292 [PMID: 9709725 DOI: 10.1016/s0022-3476(98)70239-2]

54 **Georgakopoulou EA**, Achtari MD, Evangelou K, Kittas C. Oral non-Hodgkin's lymphoma in a patient with rheumatoid arthritis treated with etanercept and methotrexate. *J Clin Exp Dent* 2015; **7**: e180-e182 [PMID: 25810835 DOI: 10.4317/jced.51922]

55 **Engels EA**, Cerhan JR, Linet MS, Cozen W, Colt JS, Davis S, Gridley G, Severson RK, Hartge P. Immune-related conditions and immune-modulating medications as risk factors for non-Hodgkin's lymphoma: a case-control study. *Am J Epidemiol* 2005; **162**: 1153-1161 [PMID: 16251389 DOI: 10.1093/aje/kwi341]

56 **Sène D**, Ismael S, Forien M, Charlotte F, Kaci R, Cacoub P, Diallo A, Dieudé P, Lioté F. Ectopic Germinal Center-Like Structures in Minor Salivary Gland Biopsy Tissue Predict Lymphoma Occurrence in Patients With Primary Sjögren's Syndrome. *Arthritis Rheumatol* 2018; **70**: 1481-1488 [PMID: 29669392 DOI: 10.1002/art.40528]

57 **Zintzaras E**, Voulgarelis M, Moutsopoulos HM. The risk of lymphoma development in autoimmune diseases: a meta-analysis. *Arch Intern Med* 2005; **165**: 2337-2344 [PMID: 16287762 DOI: 10.1001/archinte.165.20.2337]

58 **Voulgarelis M**, Ziakas PD, Papageorgiou A, Baimpa E, Tzioufas AG, Moutsopoulos HM. Prognosis and outcome of non-Hodgkin lymphoma in primary Sjögren syndrome. *Medicine (Baltimore)* 2012; **91**: 1-9 [PMID: 22198497 DOI: 10.1097/MD.0b013e31824125e4]

59 **Carubbi F**, Alunno A, Cipriani P, Di Benedetto P, Ruscitti P, Berardicurti O, Bartoloni E, Bistoni O, Caterbi S, Ciccia F, Triolo G, Gerli R, Giacomelli R. Is minor salivary gland biopsy more than a diagnostic tool in primary Sjögren׳s syndrome? Association between clinical, histopathological, and molecular features: a retrospective study. *Semin Arthritis Rheum* 2014; **44**: 314-324 [PMID: 24935529 DOI: 10.1016/j.semarthrit.2014.05.015]

60 **Salomonsson S**, Jonsson MV, Skarstein K, Brokstad KA, Hjelmström P, Wahren-Herlenius M, Jonsson R. Cellular basis of ectopic germinal center formation and autoantibody production in the target organ of patients with Sjögren's syndrome. *Arthritis Rheum* 2003; **48**: 3187-3201 [PMID: 14613282 DOI: 10.1002/art.11311]

61 **Nocturne G**, Seror R, Fogel O, Belkhir R, Boudaoud S, Saraux A, Larroche C, Le Guern V, Gottenberg JE, Mariette X. CXCL13 and CCL11 Serum Levels and Lymphoma and Disease Activity in Primary Sjögren's Syndrome. *Arthritis Rheumatol* 2015; **67**: 3226-3233 [PMID: 26359802 DOI: 10.1002/art.39315]

62 **Barnes L**, Myers EN, Prokopakis EP. Primary malignant lymphoma of the parotid gland. *Arch Otolaryngol Head Neck Surg* 1998; **124**: 573-577 [PMID: 9604985 DOI: 10.1001/archotol.124.5.573]

63 **Dey B**, Goyal V, Bharti JN, Mahajan N, Jain S. A rare cytological diagnosis of primary non-Hodgkin lymphoma of the parotid gland. *J Cytol* 2016; **33**: 108-110 [PMID: 27279690 DOI: 10.4103/0970-9371.182539]

64 **Gadodia A**, Bhalla AS, Sharma R, Thakar A, Parshad R. Bilateral parotid swelling: a radiological review. *Dentomaxillofac Radiol* 2011; **40**: 403-414 [PMID: 21960397 DOI: 10.1259/dmfr/17889378]

65 **Kolokotronis A**, Konstantinou N, Christakis I, Papadimitriou P, Matiakis A, Zaraboukas T, Antoniades D. Localized B-cell non-Hodgkin's lymphoma of oral cavity and maxillofacial region: a clinical study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005; **99**: 303-310 [PMID: 15716836 DOI: 10.1016/j.tripleo.2004.03.028]

66 **Law NW**, Leader M. Bilateral submandibular gland lymphoma in Sjögren's syndrome. *Postgrad Med J* 1987; **63**: 135-136 [PMID: 3671240 DOI: 10.1136/pgmj.63.736.135]

67 **Terada T**. Primary diffuse large B-cell lymphoma of the submandibular gland. *Int J Clin Exp Pathol* 2012; **5**: 179-181 [PMID: 22400082]

68 **Manveen JK**, Subramanyam R, Harshaminder G, Madhu S, Narula R. Primary B-cell MALT lymphoma of the palate: A case report and distinction from benign lymphoid hyperplasia (pseudolymphoma). *J Oral Maxillofac Pathol* 2012; **16**: 97-102 [PMID: 22438648 DOI: 10.4103/0973-029X.92982]

69 **Gadre S**, Ryan MW, Logroño R. MALT lymphoma of the floor of the mouth: a case report. *Ear Nose Throat J* 2009; **88**: E1-E3 [PMID: 19688701]

70 **Zhu L**, Wang P, Yang J, Yu Q. Non-Hodgkin lymphoma involving the parotid gland: CT and MR imaging findings. *Dentomaxillofac Radiol* 2013; **42**: 20130046 [PMID: 23975113 DOI: 10.1259/dmfr.20130046]

71 **King AD**, Lei KI, Ahuja AT. MRI of neck nodes in non-Hodgkin's lymphoma of the head and neck. *Br J Radiol* 2004; **77**: 111-115 [PMID: 15010382 DOI: 10.1259/bjr/53555208]

72 **Dispenza F**, Cicero G, Mortellaro G, Marchese D, Kulamarva G, Dispenza C. Primary non-Hodgkins lymphoma of the parotid gland. *Braz J Otorhinolaryngol* 2011; **77**: 639-644 [PMID: 22030974 DOI: 10.1590/s1808-86942011000500017]

73 **Shalley S**, Chand N, Aggarwal A, Garg LN, Yadav V, Yadav A. Diagnostic Accuracy of Fine Needle Aspiration Cytology in Lesions of Oral Cavity and Salivary Glands: A Clinico-Pathological Study. *Open Dent J* 2018; **12**: 782-790 [PMID: 30369988 DOI: 10.2174/1745017901814010782]

74 **Naz S**, Hashmi AA, Khurshid A, Faridi N, Edhi MM, Kamal A, Khan M. Diagnostic role of fine needle aspiration cytology (FNAC) in the evaluation of salivary gland swelling: an institutional experience. *BMC Res Notes* 2015; **8**: 101 [PMID: 25879702 DOI: 10.1186/s13104-015-1048-5]

75 **Fakhry N**, Antonini F, Michel J, Penicaud M, Mancini J, Lagier A, Santini L, Turner F, Chrestian MA, Zanaret M, Dessi P, Giovanni A. Fine-needle aspiration cytology in the management of parotid masses: evaluation of 249 patients. *Eur Ann Otorhinolaryngol Head Neck Dis* 2012; **129**: 131-135 [PMID: 22626640 DOI: 10.1016/j.anorl.2011.10.008]

76 **P A**, C A, Masilamani S, Jonathan S. Diagnosis of Salivary Gland Lesions By Fine Needle Aspiration Cytology and Its Histopathological Correlation in A Tertiary Care Center of Southern India. *J Clin Diagn Res* 2015; **9**: EC07-EC10 [PMID: 26266126 DOI: 10.7860/JCDR/2015/14229.6076]

77 **Weiler-Sagie M**, Bushelev O, Epelbaum R, Dann EJ, Haim N, Avivi I, Ben-Barak A, Ben-Arie Y, Bar-Shalom R, Israel O. (18)F-FDG avidity in lymphoma readdressed: a study of 766 patients. *J Nucl Med* 2010; **51**: 25-30 [PMID: 20009002 DOI: 10.2967/jnumed.109.067892]

78 **Latifoltojar A**, Punwani S, Lopes A, Humphries PD, Klusmann M, Menezes LJ, Daw S, Shankar A, Neriman D, Fitzke H, Clifton-Hadley L, Smith P, Taylor SA. Whole-body MRI for staging and interim response monitoring in paediatric and adolescent Hodgkin's lymphoma: a comparison with multi-modality reference standard including 18F-FDG-PET-CT. *Eur Radiol* 2019; **29**: 202-212 [PMID: 29948084 DOI: 10.1007/s00330-018-5445-8]

79 **Wang D**, Huo Y, Chen S, Wang H, Ding Y, Zhu X, Ma C. Whole-body MRI versus 18F-FDG PET/CT for pretherapeutic assessment and staging of lymphoma: a meta-analysis. *Onco Targets Ther* 2018; **11**: 3597-3608 [PMID: 29950864 DOI: 10.2147/OTT.S148189]

80 **Keraen J**, Blanc E, Besson FL, Leguern V, Meyer C, Henry J, Belkhir R, Nocturne G, Mariette X, Seror R. Usefulness of 18F-Labeled Fluorodeoxyglucose-Positron Emission Tomography for the Diagnosis of Lymphoma in Primary Sjögren's Syndrome. *Arthritis Rheumatol* 2019; **71**: 1147-1157 [PMID: 30615273 DOI: 10.1002/art.40829]

81 **Coiffier B**, Lepage E, Briere J, Herbrecht R, Tilly H, Bouabdallah R, Morel P, Van Den Neste E, Salles G, Gaulard P, Reyes F, Lederlin P, Gisselbrecht C. CHOP chemotherapy plus rituximab compared with CHOP alone in elderly patients with diffuse large-B-cell lymphoma. *N Engl J Med* 2002; **346**: 235-242 [PMID: 11807147 DOI: 10.1056/NEJMoa011795]

82 **Coiffier B**. State-of-the-art therapeutics: diffuse large B-cell lymphoma. *J Clin Oncol* 2005; **23**: 6387-6393 [PMID: 16155024 DOI: 10.1200/JCO.2005.05.015]

83 **Wilson WH**, Gutierrez M, O'Connor P, Frankel S, Jaffe E, Chabner BA, Grossbard ML. The role of rituximab and chemotherapy in aggressive B-cell lymphoma: a preliminary report of dose-adjusted EPOCH-R. *Semin Oncol* 2002; **29**: 41-47 [PMID: 11842388]

84 **Yahalom J**, Illidge T, Specht L, Hoppe RT, Li YX, Tsang R, Wirth A; International Lymphoma Radiation Oncology Group. Modern radiation therapy for extranodal lymphomas: field and dose guidelines from the International Lymphoma Radiation Oncology Group. *Int J Radiat Oncol Biol Phys* 2015; **92**: 11-31 [PMID: 25863750 DOI: 10.1016/j.ijrobp.2015.01.009]

85 **Lowry L**, Smith P, Qian W, Falk S, Benstead K, Illidge T, Linch D, Robinson M, Jack A, Hoskin P. Reduced dose radiotherapy for local control in non-Hodgkin lymphoma: a randomised phase III trial. *Radiother Oncol* 2011; **100**: 86-92 [PMID: 21664710 DOI: 10.1016/j.radonc.2011.05.013]

86 **Armitage JO**, Gascoyne RD, Lunning MA, Cavalli F. Non-Hodgkin lymphoma. *Lancet* 2017; **390**: 298-310 [PMID: 28153383 DOI: 10.1016/S0140-6736(16)32407-2]

87 **Teckie S**, Qi S, Lovie S, Navarrett S, Hsu M, Noy A, Portlock C, Yahalom J. Long-term outcomes and patterns of relapse of early-stage extranodal marginal zone lymphoma treated with radiation therapy with curative intent. *Int J Radiat Oncol Biol Phys* 2015; **92**: 130-137 [PMID: 25863760 DOI: 10.1016/j.ijrobp.2015.01.040]

88 **Armitage JO**, Longo DL. Is watch and wait still acceptable for patients with low-grade follicular lymphoma? *Blood* 2016; **127**: 2804-2808 [PMID: 26994147 DOI: 10.1182/blood-2015-11-632745]

89 **Rummel MJ**, Niederle N, Maschmeyer G, Banat GA, von Grünhagen U, Losem C, Kofahl-Krause D, Heil G, Welslau M, Balser C, Kaiser U, Weidmann E, Dürk H, Ballo H, Stauch M, Roller F, Barth J, Hoelzer D, Hinke A, Brugger W; Study group indolent Lymphomas (StiL). Bendamustine plus rituximab versus CHOP plus rituximab as first-line treatment for patients with indolent and mantle-cell lymphomas: an open-label, multicentre, randomised, phase 3 non-inferiority trial. *Lancet* 2013; **381**: 1203-1210 [PMID: 23433739 DOI: 10.1016/S0140-6736(12)61763-2]

90 **Greb A**, Bohlius J, Schiefer D, Schwarzer G, Schulz H, Engert A. High-dose chemotherapy with autologous stem cell transplantation in the first line treatment of aggressive non-Hodgkin lymphoma (NHL) in adults. *Cochrane Database Syst Rev* 2008: CD004024 [PMID: 18254036 DOI: 10.1002/14651858.CD004024.pub2]

91 **Zinzani PL**, Tani M, Stefoni V, Albertini P, Bendandi M, Gherlinzoni F, Alinari L, Vigna E, Tura S. Efficacy of vinorelbine, epirubicin and prednisone combination regimen in pretreated elderly patients with aggressive non-Hodgkin's lymphoma. *Haematologica* 2001; **86**: 287-290 [PMID: 11255276]

92 **Parvez A**, Tau N, Hussey D, Maganti M, Metser U. 18F-FDG PET/CT metabolic tumor parameters and radiomics features in aggressive non-Hodgkin's lymphoma as predictors of treatment outcome and survival. *Ann Nucl Med* 2018; **32**: 410-416 [PMID: 29754276 DOI: 10.1007/s12149-018-1260-1]

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**Table 1 Clinical features of cases with lymphoma of the salivary gland**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Ref.** | **Age/sex** | **Location** | **Size(mm)** | **Pathogenic type** | **Treatment** | **Response** | **Follow-up** |
| Andola *et al*[13] | 55/M | Bilateral parotid | 50 × 40 | DLBCL | Radiation therapy + chemotherapy | CR | 1 yr |
| Hwang *et al*[14] | 56/F | Parotid | 25 × 8 | MALT | Chemotherapy | CR | 6 mo |
| Shum *et al*[15] | 53/F | Parotid | 15 × 12 | MALT | Radiation therapy | CR | 5 yr |
|  | 53/F | Parotid | 21 × 9 | FL | Chemotherapy | CR | 2 yr |
|  | 63/F | Parotid | 20 × 80 | FL | Chemotherapy + radiation therapy | CR | 1 yr |
| Choi *et al*[16] | 16/M | Parotid | 35 × 20 | FL | Radiation therapy | CR | 6 mo |
| Alnoor *et al*[17] | 69/M | Bilateral parotid | Oct-40 | FL | Excision | CR | 3 mo |
| Romero *et al*[18] | 82/F | Parotid | NA | FL | Radiation therapy + chemotherapy | CR | NA |
| Park *et al*[19] | 68/F | Parotid | NA | FL | Radiation therapy | RD | 54 mo |
|  | 55/M | Parotid | NA | FL | NA | NA | NA |
| Yang *et al*[20] | 41/M | Parotid | NA | MALT | Radiation therapy + chemotherapy | RD | 12 mo |
| Yonal-Hindilerden *et al*[21] | 61/F | Ulcerated palate + parotid | 20 × 25/25 × 35 | MALT | Chemotherapy (R-CHOP) | CR | 44 mo |
| Shashidara *et al*[22] | 40/F | Submandibular | 90 × 40 | FL | NA | NA | NA |
| Faur *et al*[23] | 71/F | Parotid | 50 × 35 | DLBCL | NA | NA | NA |
|  | 49/F | Parotid | 65 × 63 | MALT | NA | NA | NA |
| Alves *et al*[24] | 32/M | Parotid | 30 | NLPHL | Radiation therapy | CR | 1 yr |
| Revanappa *et al*[25] | 73/F | Parotid + submandibula | NA | DLBCL | Radiation therapy + chemotherapy | NA | NA |
| Titsinides*et al*[26] | 64/F | Ulcerated palate | 10 | MALT | Chemotherapy | CR | 2 yr |
| Van Mello *et al*[27] | 53/F | Labial | NA | MALT | Chemotherapy | NA | NA |
|  | 53/F | Labial + parotid | NA | MALT | Chemotherapy | NA | NA |
|  | 55/F | Labial + parotid | NA | MALT | Chemotherapy | NA | NA |
| Hew *et al*[28] | 55/F | Parotid | 20 × 8 | T cell lymphoma | Radiation therapy + chemotherapy | NA | NA |

MALT: Mucosa associated lymphoid tissue lymphoma; DLBCL: Diffuse large B cell lymphoma; FL: Follicular lymphoma; CR: Complete remission; NA: Not available; RD: Relapsed disease; R-CHOP: Rituximab with cyclophosphamide, doxorubicin, vincristine, and prednisone; NLPHL: Nodular lymphocyte predominance hodgkin lymphoma.