



REVIEW

Jorge Candia¹.
Alejandra Fernández¹.
Kim Kraemer¹.

1. Universidad Andrés Bello, Chile.

Corresponding author: Alejandra Fernández. Avenida Echaurren 237, Santiago, Chile. Phone: (+56) 998796026. E-mail: fernandez.alejandra@gmail.com

Receipt: 12/16/2015 **Revised:** 12/28/2015
Acceptance: 01/18/2016 **Online:** 01/18/2016

Survival and mortality from oral cancer by anatomical location. A narrative review.

Abstract: Oral cancer is a global problem. It is the sixth most frequent cancer among all types of cancer and can affect different areas of the oral cavity. Survival rates are influenced by various factors, such as: histological type, tumor size, presence of regional and/or distance metastases, and the biological status of the patient. According to WHO, survival rate from oral cancer at 5 years is 53-56%. The objective of this review is to describe the survival and mortality rate from oral cancer by anatomical location at national and global scale. Globally, the survival rate for cancer located at the lips, tongue, floor of the mouth, palate, jaws, alveolar ridge and salivary glands ranges from 0% to 100%. However, Chile has not reported the survival rate for different anatomical locations. No information was found in relation to mortality rates for different anatomical locations in Chile and in the world. It is considered that oral cancer affecting the tongue, floor of the mouth, palate and alveolar ridge have the worst prognosis, and conversely, those affecting the lower lip have the best prognosis.

Keywords: *Survival rate, Mortality rate, Oral cancer, Epidemiology, Squamous Cell Carcinoma.*

DOI: 10.17126/joralres.2016.007.

Cite as: Candia J, Fernández A & Kraemer K. Survival and mortality from oral cancer by anatomical location. Narrative review. *J Oral Res* 2016; 5(1): 35-42.

INTRODUCTION.

According to the World Health Organization (WHO), cancer is the leading cause of death worldwide. In 2012 there were 36.2 million people living with cancer and 8.2 million people died from this disease^{1,2}. The WHO is now conducting the GLOBOCAN project, which provides data on mortality and prevalence of cancer (including oral cancer) in different geographical areas. GLOBOCAN reported a mortality of 1.8% globally for oral cancer³.

One way to study the survival rate of oral cancer is by anatomical location. This includes the lining mucosa of the lips, the inside of the cheek, palate, anterior two-thirds of the tongue, floor of the mouth and alveolar ridge, maxillary and palatine bones, major and mi-

nor salivary glands⁴. Of these, the most affected area is the vermilion of the lower lip, followed by the side edge of the tongue, floor of the mouth, the inside of the cheek and the mucosa of the alveolar ridge^{5,6}.

The objective of this narrative review is to describe the survival and mortality rates of oral cancer by anatomical location at national and global scale.

Lip cancer

Most data reported in the literature is related to survival of oral squamous cell carcinoma and melanoma on the lower lip. Neville *et al.*⁶ and Salihu *et al.*⁷ place particular emphasis on the survival rate according to the TNM stage of the patient. It is noteworthy that the higher the TNM stage, the lower the survival rate. The data reported by these authors

Table 1. Survival rate of lip cancer by TNM classification at 5 and 10 years by Neville⁶ and Salihu⁷.

Stage	TNM Clasification	Survival rate	
		5 years Neville <i>et al.</i>	10 years Salihu <i>et al.</i>
Stage I	T1 N0 M0	83%	91.7%
Stage II	T2 N0 M0	73%	83.7%
Stage III	T3 N0 M0, or T1, T2, or T3 N1 M0	62%	28%
Stage IV	IVA T4a N0 or N1 M0, or T1, T2, T3, or T4 N2 M0	47%	11.4%
	IV B Any T N3 M0, or T4b with any N M0		
	IVC Any lesion with M1		

at 5 and 10 years respectively are shown in Table 1.

Zini *et al.*⁵ think that between 6.6% to 26.5% of lip cancer cases at the time of diagnosis are associated with metastasis in cervical lymph nodes, specifically submental and submandibular lymph nodes. Its survival rate ranges from 25% to 50% at 5 years.

Other malignant lesions such as melanoma can also be found at this location. According Jing *et al.*⁸, melanoma is more common in the lower lip and has a survival rate of 56% at 5 years. In addition, it has a 46% chance of regional metastases in lymph nodes. Still, labial melanoma has the lowest rate of regional/distance metastases and better prognosis than other melanomas of the oral mucosa.

In Chile, Riera *et al.*⁹ reported that mortality from lip cancer accounted for 9% of all deaths from oral cancer between 1950 and 2002. Ramirez *et al.*¹⁰ indicated that for the decade 2002-2012 lip cancer accounted for only 4%. Colil *et al.*¹¹ in the Valparaíso region reported a mortality of 4.05% for the period 2001-2010, with a male/female ratio of 2.7: 1.

Tongue cancer

Records on survival rate for tongue cancer refer to squamous cell carcinoma (SCC). Authors like Neville *et al.*⁶, Rodrigues *et al.*¹², and Azimi *et al.*¹³ indicate that survival beyond five years will depend on the location of lingual tumor and TNM stage. At diagnosis, almost 50% of all carcinomas of the tongue have

already metastasized¹⁴. Therefore, Rodrigues *et al.*¹² suggest that nodal involvement plays an important role in the prognosis, since its presence is associated with decreased survival.

Capote-Moreno *et al.*¹⁴ reported an incidence of 31.4% of contralateral metastasis when the tongue base is affected, and 7.2% in the movable tongue. According to the American Cancer Society (ACS)⁴, the survival rate at 5 years with local metastasis is 78%, 63% with regional, and 36% with distance metastasis.

Neville *et al.*⁶ and Zini *et al.*⁵ indicated that when the tumor is located at the base of the tongue survival at 5 years is 42.6%. In other areas of the tongue the percentages range from 40% to 49.9%. Table 2 shows the correlation of different clinical characteristics with the survival rate at 5 years according to Azimi *et al.*¹³ and Rodrigues *et al.*¹²

In Chile, according to Riera *et al.*⁹, tongue cancer accounted for 39% of deaths from oral cancer. According to Ramirez *et al.*¹⁰ of the total number of cases, 16.9% were men and 19.7%, women. Colil *et al.*¹¹ reported that tongue cancer mortality was 12.6%, with a male/female ratio of 3.6:1.

Cancer of the floor of the mouth

Most of the information found in the literature refers to SCC of the floor of the mouth. As the carcinoma of the tongue, the floor of the mouth carcinoma is one of the more aggressive and more likely to spread

Table 2. Tongue cancer and survival rate at 5 years according to demographic and clinical parameters.

Parameters	Characteristics	Rodrigues <i>et al.</i> ¹² Survival at 5 years	Azimi <i>et al.</i> ¹³ Survival at 5 years
Year	< 58 years	75.7%	
	≥ 58 years	77.7%	
Sex	Male	73.5%	
	Female	79.7%	
Ethnicity	Caucasian	78.6%	
	No Caucasian	62.4%	
Smoker	No	87.2%	
	Yes	72.8%	
Alcohol drinking	No	83.0%	
	Yes	73.2%	
TNM clinical stage	Early I	83.6%	60%
	Early II	83.6%	60%
	Advanced III	62.8%	21%
	Advanced IV	62.8%	16.6%
Surgical margins	> 5mm	77.5%	
	< 5mm	69.9%	
Histological risk model	Low/Medium	80.1%	
	High	71.3%	

at distant locations¹⁵. Capote-Moreno *et al.*¹⁴ reported that the incidence of contralateral local nodal metastasis is 11%. According to ACS⁴, the relative survival rate at 5 years with local metastasis is 75%, 38% with regional, and 20% with distance metastasis.

Marsiglia *et al.*¹⁶ found that when treated by radiation therapy, the survival rate of patients with cancer on the floor of mouth at TNM stages I and II at 2 years was 89% and 76% at 5 years. Pimienta Amaral *et al.*¹⁷ reported an overall survival rate of 68.5% at 5 years in patients with SCC at TNM stages I and II of tongue and floor of mouth cancer. When considering all TNM stages, Rikimaru *et al.*¹⁸ reported an overall survival rate of 88% at 3 years, a 100% for stages I and II, and 67% for stages III and IV.

In Chile, according to Riera *et al.*⁹, the floor of the mouth cancer accounted for 18% of deaths from oral

cancer. According to Ramirez *et al.*¹⁰ of the total number of patients affected by this neoplasia 10.6% were men and 6.8%, women. Colil *et al.*¹¹ reported a mortality rate of 3.37%, with a male/female ratio of 4:1.

Palate cancer

For this location the survival data available are related to SCC, adenocarcinoma and melanoma. In the hard palate Zini *et al.*⁵ reported a survival rate of 50-59% at 5 years for SCC. Yang *et al.*¹⁹ found a survival rate ranging from 57% to 67% between 3 and 5 years. Li *et al.*²⁰ found the following survival rate at 5 years, considering the regional nodal involvement: N0 47.36%, N1 27.48%, N2 15.55%, and N3 0%.

Zini *et al.*⁵ reported that a in the case of a SCC in the soft palate, survival varies between 60% and 69.9% at 5 years. However, this figure decreased with nodal involvement, N1 27.48%, N2 15.55%,

and N3 0%. With respect to the adenoid cystic carcinoma, Li *et al.*²¹ reported that with surgical therapy rates were 75%, 37.5%, and 25% at 5, 10 and 15 years, respectively. With surgery and radiotherapy rates were 70.6%, 35.3%, and 20.8% at 5, 10 and 15 years, respectively. Regarding oral melanoma survival rates according to location and histological type of the affected mucosa were considered. For the keratinized area, a survival rate ranging between 5% and 20% at 5 years was found^{19,22}.

In Chile, Ramirez *et al.*¹⁰ reported that the mortality rate for palate cancer is 3.9% for men and 4.2% for women of all deaths from oral cancer. According to Colil *et al.*¹¹ palate cancer accounted for 3.37%, with a male/ female ratio of 4:1.

Cancer of the alveolar ridge

Survival data described corresponds to carcinomas, as it is the most common neoplasia in this location, specifically in the posterior mandibular area. There are no data about mortality or survival with respect to this anatomical location in Chile.

Nakasato *et al.*²³ reported a survival rate of 70% at 5 years for SCC. However, this rate decreases to 30.8% in the presence of metastases in the regional lymph area²⁴. In the maxillary alveolar ridge and hard palate, Rikamuru *et al.*²⁵ found a survival rate of 27% at 3 years, and 60% for the mandibular ridge area.

Cancer of the mandible

Survival data described corresponds to osteosarcoma (most common malignancy of the maxillary area, particularly relevant is its location in the jaw)²⁶ and lymphomas (the second most common malignancy in this area)²⁷.

With respect to osteosarcomas, Lee *et al.*²⁶ reported that the overall survival rate at 5 and 10 years is 53% and 35%, respectively. The rate of disease-specific survival at 5 and 10 years is 62% and 54%, respectively.

Steve *et al.*²⁸ reported that the survival rate at 5 years is 50%. Similar data was found by Paparella *et al.*²⁹, as they obtained a survival rate of 68% at 5 years.

Lymphomas in the jaws have a survival rate of 55% at 5 years. This percentage drops to 30% if the lymphoma is located at the maxillary sinus^{27,30}.

In Chile, Colil *et al.*¹¹ reported that cancer of the jawbone accounted for 8.78% of the total deaths from oral cancer. The male/female ratio was 1:1.1.

Salivary Gland Cancer

Malignant neoplasms of the salivary glands are more than 0.5% of all cancers and account for approximately 3-5% of all cancers of the head and neck. Malignancy varies according to location: 20% to 25% for tumors of the parotid, 35% to 40% for submandibular tumors, 50% for palate tumors, and more than 90% for sublingual gland tumors³¹.

The National Cancer Institute (NCI)³¹ reports that the most common malignancy of the major and minor salivary glands is the mucoepidermoid carcinoma, accounting for about 10% of all salivary gland neoplasms.

With respect to the major salivary glands, Maza-Solano *et al.*³² found that survival at 5 years for malignant parotid gland tumors was 60%. Speight *et al.*³³ in a study of adenocarcinomas of low, medium and high grade malignancy in the parotid gland, found survival rates of 91%, 41% and 50%, respectively.

Malignant tumors of the submandibular gland are rare and most are treated with surgery. Pohad *et al.*³⁴ found a median overall survival of 59 months for malignant tumors of the submandibular gland, the survival rate at 5 years was 50% and 28% at 10 years. In sublingual gland tumors, Zdanowski *et al.*³⁵ reported an overall survival rate of 78.7% at 5 years and a rate of disease-free survival of 87.5%.

Luksic *et al.*³⁶ revealed a survival rate of 62%, 53%

Table 3. Five-year survival of salivary gland cancer by TNM stage³⁷.

TNM Stage	Relative survival rate at 5 years
I	91%
II	75%
III	65%
IV	39%

Table 4. Survival rates of the most common major malignancies of salivary glands³⁸.

Histology	Survival at 5 years
Low-grade pleomorphic adenoma	95-100%
Acinar cell carcinoma	75-96%
Mucoepidermoid carcinoma L.G	75-89%
Myoepithelial carcinoma	67%
Mucoepidermoid carcinoma H.G	23-50%
Adenoid cystic carcinoma	35-70%
Carcinoma ex pleomorphic adenoma	40%
Salivary duct carcinoma H.G	20-35%

and 27% at 5, 10 and 15 years, respectively, in minor salivary glands with adenoid cystic carcinoma and perineural invasion. In neoplasms that had no perineural invasion, an overall survival rate of 90% was observed.

ACS³⁷ classifies the survival rate of these lesions depending on the clinical stage of the tumor (Table 3). Overall, approximately 72% of people diagnosed with major salivary gland cancer are still alive at least 5 years after diagnosis. However, there are other factors that should be taken into account because they may also affect the survival and prognosis of the disease, such as a person's medical history, age, type and grade of the tumor and biological condition of the patient³⁷. Guzzo *et al.*³⁸ linked the histological type of these tumors with survival rates (Table 4).

In Chile, according to Riera *et al.*⁹, mortality from cancer of major salivary glands accounted for 30% of total deaths from oral cancer, affecting a 65% of men and 35% of women, with a male/female ratio of 1.4:1.

They found that mortality from salivary gland cancer increased steadily with age, and the highest number of deaths was in those patients over 75 years (35.4%), affecting a 50.3% and a 49.7% of men and women, respectively. Ramirez *et al.*¹⁰ reported that the number of deaths from cancer of salivary glands was 12.8% for men and 20.2% for women. Colil *et al.*¹¹ reported a mortality of 14.86% from cancer of major salivary glands of the total deaths from oral cancer. Men were affected in a 11.76% and women in a 19.04%.

DISCUSSION.

Most of the available literature covers specifically the clinical and pathological characteristics of squamous cell carcinoma, possibly because of its high frequency. There is little information about other primary cancers located in the mouth, such as sarcomas, lymphomas, melanomas and even metastasis.

Available information on oral cancer in different anatomical locations only provides survival rates. No

survival data were found regarding the Chilean population. There are no indicators of mortality available for the different anatomical areas either. In Chile, data linking the death rate from oral cancer in each anatomical location with the total cases of oral cancer is the only information available.

Given that the information used in this study comes from databases provided by the WHO and national cancer registries and hospitals is not surprising to observe different values of survival rate for each anatomical location. Three reports on oral cancer mortality in Chile were found. Rates and figures reported varied among the different studies according to the source of information and period studied. Riera *et al.*⁹ analyzed information from the National Statistics Institute of Chile (INE), between 1955-2002. Ramirez *et al.*¹⁰ obtained data from the Department of Health Statistics and Information of Chile (DEIS), between 2002-2012. Colil *et al.*¹¹ used data provided by the National

Civil Registry in Valparaíso Region of Chile, between 2001-2010.

Given the above, results presented here are not comparable, but they may help identify the most vulnerable areas of the mouth and improve prognosis. Neoplasms affecting the tongue, floor of mouth, palate and alveolar ridge have the worst prognosis. Conversely, the lower lip has the best prognosis. However, this may vary according to the size of the tumor, presence of nodal metastasis, distant metastasis and the general characteristics of the patient.

Survival rates presented in this review have the aim to encourage oral cancer prevention campaigns. We need to emphasize the importance of self-examination of the oral cavity to identify suspicious lesions and improve the management of oral cancer in the various health institutions, as oral cancers diagnosed early and treated promptly have better prognosis and a higher chance of cure.

Supervivencia y mortalidad por cáncer oral según localización anatómica. Revisión narrativa.

Resumen: El cáncer oral es un problema a nivel mundial, alcanzando el 6^{to} lugar en frecuencia entre todos los tipos de cáncer, pudiendo afectar a distintas zonas de la cavidad oral. Las tasas de supervivencia están influenciadas por diversos factores, tales como: tipo histológico, tamaño del tumor, presencia de metástasis regional y/o distancia y el estado biológico del paciente. Según la OMS, la tasa de supervivencia del cáncer oral a los 5 años es de 53 a 56%. El objetivo de esta revisión es describir la tasa de supervivencia y mortalidad del cáncer oral según zona anatómica afectada a nivel mundial y nacional. A nivel mundial, la tasa de supervivencia para las localizaciones

de labio, lengua, piso de boca, paladar, huesos maxilares, reborde alveolar y glándulas salivares variaron entre un 0% a 100%. Sin embargo, en Chile no se ha reportado la tasa de supervivencia para las diferentes localizaciones anatómicas. En el mundo y en nuestro país, no se encontró información relacionada con tasa de mortalidad para las distintas zonas anatómicas. Se considera que las neoplasias orales que afectan la lengua, el piso de boca, el paladar y el reborde alveolar son las de peor pronóstico, y que por el contrario, las que afectan al labio inferior son los de mejor pronóstico.

Palabras clave: Tasa de supervivencia, Tasa de mortalidad, Neoplasia oral, Epidemiología, Carcinoma de Células Escamosas.

REFERENCES.

1. WHO [Internet]. Centro de Prensa. Cited January, 2016. Available at: <http://www.who.int/mediacentre/factsheets/fs297/es/>
2. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer*. 2015;136(5):E359-86.

3. WHO [Internet]. International Agency for Research of Cancer. Cited 2015. Available at: http://globocan.iarc.fr/Pages/fact_sheets_population.aspx.
4. CANCER [Internet]. USA: American Cancer Society. Cited July 12, 2015. Available at: <http://www.cancer.org/acs/groups/cid/documents/webcontent/003128.pdf.pdf>.
5. Zini A, Czerninski R, Sgan-Cohen HD. Oral cancer over four decades: epidemiology, trends, histology, and survival by anatomical sites. *J Oral Pathol Med*. 2010;39(4):299-305.
6. Neville B, Damm D, Allen C, Chi A. *Oral and Maxillofacial Pathology*. 4a ed. United States: Elsevier; 2015.
7. Salihu S, Güven O, Gllareva E, Prekazi M, Salihu L. A clinical study on survival rate of patients with squamous cell carcinoma of the lower lip in Kosovo. *J Craniomaxillofac Surg*. 2014;42(8):1773-7.
8. Jing G, Wu Y, Song H, Ren G, Wang R, Guo W. Primary Malignant Melanoma of the Lip: A Report of 48 Cases. *J Oral Maxillofac Surg*. 2015;73(11):2232-40.
9. Riera P, Martínez B. [Morbidity and mortality for oral and pharyngeal cancer in Chile] *Rev Med Chil*. 2005;133(5):555-63.
10. Ramírez V, Vásquez-Rozas P, Ramírez-Eyraud P. Mortalidad por cáncer oral y faríngeo en Chile, años 2002-2010. *Rev Clin Periodoncia Implantol Rehabil Oral*. 2015;8(2):133-8.
11. Colil C, Cueto A, Fernandez A, Esguep A. Cáncer Orofaríngeo: Caracterización de la Mortalidad en Urbanización Valparaíso-Viña del Mar 2001-2010. *Int J Odontostomat*. 2013;7(1):117-123.
12. Rodrigues PC, Miguel MC, Bagordakis E, Fonseca FP, de Aquino SN, Santos-Silva AR, Lopes MA, Graner E, Salo T, Kowalski LP, Coletta RD. Clinicopathological prognostic factors of oral tongue squamous cell carcinoma: a retrospective study of 202 cases. *Int J Oral Maxillofac Surg*. 2014;43(7):795-801.
13. Azimi H, Khajehahmadi S, Rahpeyma A. Tongue Squamous Cell Carcinoma: A Clinical Study. *Iran J Pathol*. 2014;9(1):28-32.
14. Capote-Moreno A, Naval L, Muñoz-Guerra MF, Sastre J, Rodríguez-Campo FJ. Prognostic factors influencing contralateral neck lymph node metastases in oral and oropharyngeal carcinoma. *J Oral Maxillofac Surg*. 2010;68(2):268-75.
15. Rhodus NL, Kerr AR, Patel K. Oral cancer: leukoplakia, premalignancy, and squamous cell carcinoma. *Dent Clin North Am*. 2014;58(2):315-40.
16. Marsiglia H, Haie-Meder C, Sasso G, Mamelle G, Gerbaulet A. Brachytherapy for T1-T2 floor-of-the-mouth cancers: the Gustave-Roussy Institute experience. *Int J Radiat Oncol Biol Phys*. 2002;52(5):1257-63.
17. Pimenta Amaral TM, Da Silva Freire AR, Carvalho AL, Pinto CA, Kowalski LP. Predictive factors of occult metastasis and prognosis of clinical stages I and II squamous cell carcinoma of the tongue and floor of the mouth. *Oral Oncol*. 2004;40(8):780-6.
18. Rikimaru F, Matsuo M, Higaki Y, Tomita K. Squamous Cell Carcinoma Management of the Floor of Mouth. *Pract Otorhinolaryngol*. 2010;103(8):721-4.
19. Yang X, Zhang CP, Guarda-Nardini L, Hu YJ, Yang WJ, Guo W, Li J, Zhong LP V. Neck dissection and post-operative chemotherapy with dimethyl triazeno imidazole carboxamide and cisplatin protocol are useful for oral mucosal melanoma. *BMC Cancer*. 2010;10:623.
20. Li Q, Wu D, Liu W, Li H, Liao W, Zhang X, Liu Z, Guo Z, Liu X. Oral and maxillofacial surgery: Survival impact of cervical metastasis in squamous cell carcinoma of hard palate. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2013;1(116):23-7.
21. Li Q, Xu T, Gao J, Ye W, Gu M, Hu W, Wang F, Cai X. Surgery alone provides long-term survival rates comparable to those of surgery plus postoperative radiotherapy for patients with adenoid cystic carcinoma of the palate. *Oral Oncol*. 2011;43(3):170-3.
22. Magremanne M, Vervaeke C. [Melanoma of the oral mucosa] *Rev Stomatol Chir Maxillofac*. 2008;109(3):175-7.
23. Nakasato T, Izumisawa M, Akahane A, Kikuchi K, Ehara S, Shoji S, Kogi S, Mizuki H, Sugiyama Y. Combined intra-arterial infusion and systemic chemoradiotherapy for stage IV squamous cell carcinoma of the mandibular gingiva. *Jpn J Radiol*. 2012;30(9):752-61.
24. Patel AA. Is alveolar /gingival squamous carcinoma an aggressive subsite of oral cancer? *J Oral Maxillofac Surg*. 2008;66(8):30-31.
25. Rikimaru F, Matsuo M, Higaki Y, Tomita K. Treatment for squamous cell carcinoma of maxillary gingiva/hard palate and mandibular gingiva. *J Jpn Soc Head Neck Surg*. 2012;22(3):283-6.
26. Lee R, Arshi A, Schwartz H, Christensen R. Characteristics and prognostic factors of osteosarcoma of the jaws: a retrospective cohort study. *JAMA Otolaryngol Head Neck Surg*. 2015;141(5):470-7.
27. Fernández A, Cordova P, Badénier O, Esguep A. Caracterización epidemiológica del cáncer oral. *Revisión de la literatura*. *J Oral Res*. 2015;4(2):137-5.
28. Steve M, Ernenwein D, Chaine A, Bertolus C, Goudot P, Ruhin-Poncet B. Osteosarcomes des mâchoires. *Rev Stomatol Chir Maxillofac*. 2011;112(5):286-92.
29. Paparella ML, Olvi LG, Brandizzi D, Keszler A, Santini-Araujo E, Cabrini RL. Osteosarcoma of the jaw: an analysis of a series of 74 cases. *Histopathology*. 2013;63(4):551-7.
30. Brachet P, Deleval L, Chantraine G, Loeb I, Saussez S. [Hard palate B cell lymphoma with spontaneous regression] *Rev Stomatol Chir Maxillofac*. 2011;112(3):180-2.
31. NIH [Internet]. USA: National Cancer Institute. Cited December 20, 2015. Available at: <http://www.cancer.gov/types/head-and-neck/hp/salivary-gland-treatment-pdq>.
32. Maza-Solano J, Sánchez-Gómez S, Herrero-Salado T, Benavente-Bermudo G, Ventura-Díaz J, de Mingo Fernández E. Clasificación pronóstica de los tumores malignos de glándula parótida. *Rev Esp Cir Ora Maxilo-*

fac. 2015;In Press

33. Speight PM, Barrett AW. Prognostic factors in malignant tumours of the salivary glands. Br J Oral Maxillofac Surg. 2009;47(8):587-93.
34. Pohar S, Venkatesan V, Stitt LW, Hall SF, Hammond JA, Read N, Yoo J, Fung K, Pavamani S. Results in the management of malignant submandibular tumours and guidelines for elective neck treatment. J Otolaryngol Head Neck Surg. 2011;40(3):191-5.
35. Zdanowski R, Dias FL, Barbosa MM, Lima RA, Faria PA, Loyola AM, Nascimento Souza KC. Sublingual gland tumors: clinical, pathologic, and therapeutic analysis of 13 patients treated in a single institution. Head Neck. 2011;33(4):476-81.
36. Lukšić I, Sutton P, Macan D, Dinjar K. Intraoral adenoid cystic carcinoma: is the presence of perineural invasion associated with the size of the primary tumour, local extension, surgical margins, distant metastases, and outcome? Br J Oral Maxillofac Surg. 2014;52(3):214-8.
37. CANCER [Internet]. USA: American Cancer Society. Cited July 12, 2015. Available at: <http://www.cancer.org/acs/groups/cid/documents/webcontent/003137-pdf.pdf>.
38. Guzzo M, Locati LD, Prott FJ, Gatta G, McGurk M, Licitra L. Major and minor salivary gland tumors. Crit Rev Oncol Hematol. 2010;74(2):134-48.