CASE REPORT

Leimyosarcoma of the buccal mucosa and review of literature

Deepak Kumar J Nagpal, Prashant R Prabhu, Amisha Shah[1], Sangeeta Palaskar
Departments of Oral and Maxillofacial Pathology, Sinhgad Dental College and Hospital, [1]M. A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India

Address for correspondence:
Dr. Deepak Kumar J Nagpal,
Department of Oral and Maxillofacial Pathology,
Sinhgad Dental College and Hospital,
Pune - 411 041, Maharashtra, India.
E-mail: deepaknagpal2013@rediffmail.com

ABSTRACT

Leiomyosarcoma (LMS) is an uncommon malignant spindle cell tumor of the head and neck region. The occurrence is particularly rare in the buccal mucosa of the oral cavity. It is a rapidly growing tumor with aggressive behavior and poor prognosis. Method: This article presents a rare case of primary leimyosarcoma of the buccal mucosa in a 35 year old female and retrospective analysis of primary oral LMS published in the English literature since past 20 years is done. Diagnosis was confirmed by immunohistochemistry profile showing positivity for vimentin, smooth muscle actin (SMA), high proliferative index displayed by Ki-67, focal positivity for pan-CK and negativity for S-100. Conclusion: Based on the presence of malignant spindle cells showing positivity for vimentin and SMA, a diagnosis of leiomyosarcoma was made.

Key words: **Ki-67, leiomyosarcoma, smooth muscle actin, spindle cell**

INTRODUCTION

Tumors of the smooth muscle are rare in the head and neck region especially the buccal mucosa due to the scarcity of this tissue in this region and thus are frequently seen in the gastrointestinal and female genital tract because of the preponderance of smooth muscle at these sites.[1,2] In the head and neck region, these tumors are believed to arise from the tunica media of the blood vessels. Clinically, they are very aggressive, and the prognosis is poor.[3] In the oral cavity most of the cases are seen in the mandible, maxilla, tongue, cheek, hard and soft palate, floor of the mouth and lip.[4,5] They are less frequently seen on the buccal mucosa. We report a rare case of leiomyosarcoma of the buccal mucosa.

CASE REPORT

A 35-year-old female presented with difficulty in opening the mouth since past 1 month. On clinical examination an ulcerative lesion on the left buccal mucosa adjacent to the maxillary left third molar was observed. The lesion was non-tender and firm in consistency, measuring about 1 × 1 cm in dimension, with inflamed surrounding margins. Lymph nodes were not palpable in the cervical region. An axial computed tomography scan showed an iso-dense mass in the right buccal mucosal region causing the swelling [Figure 1]. Excisional biopsy was done under local anesthesia, and the formalin fixed specimen was processed for histopathological examination. Microscopic examination revealed spindle shaped cells proliferating in various patterns [Figure 2]. The cells showed cellular and nuclear pleomorphism, increased mitotic figures, and prominent nucleoli. Single and multinucleated giant cells containing dark eosinophilic cytoplasm in a myxomatous connective tissue were also observed. Inflammatory cells and hyalinized blood vessels with spindle cells proliferation around them were evident. Immunohistochemical staining showed strong positivity for vimentin [Figure 3], smooth muscle actin (SMA) [Figure 4], and high proliferative index displayed by Ki-67 [Figure 5]. Desmin, S-100, and pancytokeratin were negative. These immunohistochemical findings satisfy the criteria for leiomyosarcoma. Due to loss of follow-up further treatment of the patient could not be completed.

DISCUSSION

The literature review of primary leiomyosarcoma of the oral cavity in past 20 years retrieved is listed in Table 1. Cases of nasopharynx, and metastatic tumors from other organs were excluded. The most frequent site was mandible accounting for 20 cases, followed by maxilla 15 cases, 10 cases in tongue and 9 cases in buccal mucosa, 2 each in lip, floor of the mouth, hard palate, soft palate and maxillary sinus. Out of 63 patients, 33 patients were male (56%) and 30 were female (44%) [Figure 6]. Ages ranged from 6 years to 90 years.

Access this article online
Quick Response Code:
Website: www.jomfp.in
DOI: 10.4103/0973-029X.110732

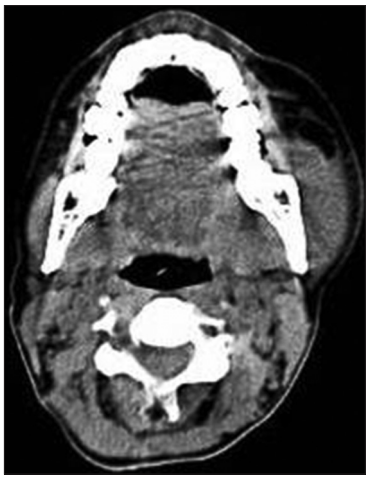

Figure 1: An axial computed tomography scan showing an iso-dense mass in the right buccal mucosal region causing facial swelling

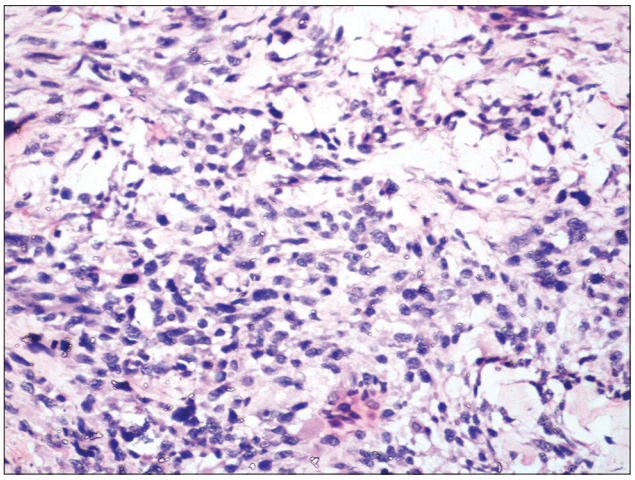

Figure 2: Photomicrograph showing interlacing fascicles and bundles of spindle cells (H and E, ×100)

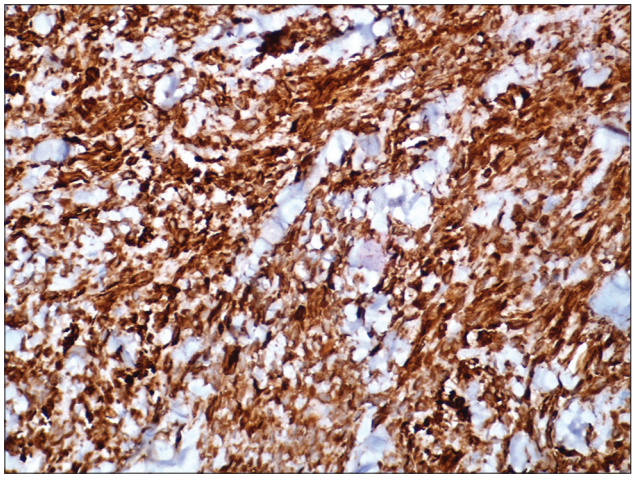

Figure 3: Photomicrograph showing immunopositivity for vimentin (original magnification ×400)

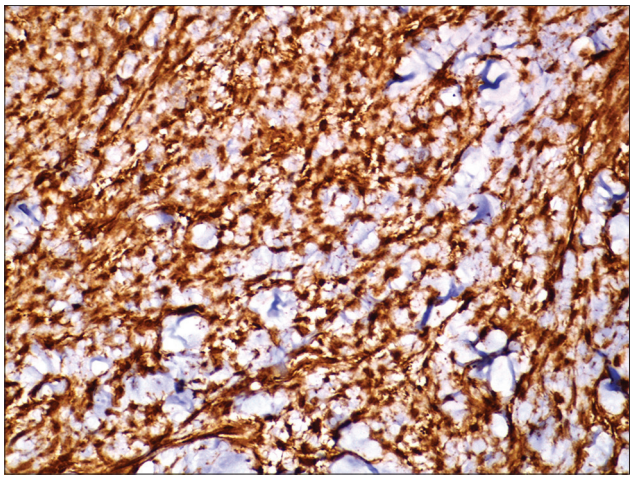

Figure 4: Photomicrograph showing immunopositivity for smooth muscle actin (original magnification ×400)

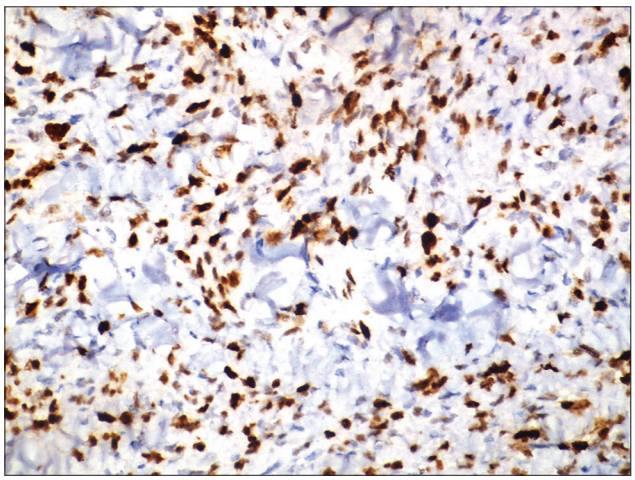

Figure 5: Photomicrograph displaying proliferative activity by Ki-67 (x200)

Prognostically, 28 cases were alive with no disease during the follow-up period which ranged from 6 months to 120 months. Twenty-one patients died of this disease during the follow-up period which ranged from 1 month to 37 months. Six patients were alive with disease. Information was not available for nine patients who were lost during the follow-up and remaining three cases died of other causes.

Soft tissue sarcomas are relatively rare neoplasms that may arise in any anatomic region. Occurrence in the head and neck accounts for less than 1% of all malignant tumors in this site.[5] Only 3-10% of leiomyosarcoma (LMS) cases arise in the head and neck [Figure 7]. Smooth muscles is sparse in the head and neck region and are mainly found in the walls of blood vessels, erector pili musculature of the skin, circumvallate papillae and myoepithelial cells of the salivary glands. LMS may also be derived from the undifferentiated pluripotential cells.[15,19] Clinically most often LMS presents as a nodular painless, well circumscribed mass, adherent firmly to the surrounding tissues which sometimes may be ulcerated as was in our presented case. There is no age and sex predilection.[20] Histologically LMS typically displays spindle cells with abundant cytoplasm

Table 1: Data of primary oral LMS from the English literature

Author	Site	Age/sex	Follow-up	Status
Mequita *et al*.[2]	Buccal mucosa	23/female	24	AND
Izumi *et al*.[6,7]	Maxilla	70/male	22	AND
Vilos *et al*.[6]	Gingiva mand premolar	27/female	21	DFD
Vilos *et al*.[6]	Maxilla	28/female	7	AWD
Krishnan *et al*.[8]	Mandible	27/male	19	AWD
Sumida *et al*.[9]	Maxillary sinus with LN metastasis	77/male	3	DFD
Yang *et al*.[10]	Tongue tip	54/female	12	AND
Mitsudo K *et al*.[11]	Maxilla	35/male	24	AND
Centeno *et al*.[12]	Mandible	13/male	24	AND
Vilos *et al*.[6]	Maxillary alveolar ridge	12/male	24	AND
Vilos *et al*.[6]	Mandibular condyle	56/female	24	DFD
Vilos *et al*.[6]	Mand alveolar process	64/female	12	AND
Schenberg *et al*.[5,6]	Maxilla	30/male	6	AND
Schenberg *et al*.[5,6]	Buccal mucosa	38/male	15	AND
Schenberg *et al*.[5,6]	L maxilla	26/male	15	DFD
Schenberg *et al*.[5,6]	R buccal mucosa	42/male	32	AND
Vilos *et al*.[6]	Tongue	60/male	12	AND
Vilos *et al*.[6]	Upper lip	90/female	01	DFD
Vilos *et al*.[6]	Tongue	80/female	LOST	INA
Vilos *et al*.[6]	L mand ramus	26/female	19	AND
Vilos *et al*.[6]	R mand angle	34/male	26	AND
Vilos *et al*.[6]	Tongue	57/male	48	DFD
Vilos *et al*.[6]	Mand retromolar region	63/female	24	DFD
Vilos *et al*.[6]	R maxilla	58/male	12	AND
Carter *et al*.[13]	L mand alveolar process	7/female	17	AND
Vilos *et al*.[6]	L mandible	11/male	20	AWD
Goldschmidt *et al*.[6]	L mand alveolar process	24/female	120	AND
Vilos *et al*.[6]	Gingiva	-/male	LOST	INA
Vilos *et al*.[6]	L mandible	27/female	28	AND
Vilos *et al*.[6]	Upper lip	91/female	46	DOC
Vilos *et al*.[6]	Hard palate	34/female	14	DFD
Vilos *et al*.[6]	Tongue	15/female	50	AND
Vilos *et al*.[6]	Mandible	74/female	2	DOC
Vilos *et al*.[6]	Maxilla	28/male	37	DFD
Vilos *et al*.[6]	Floor of mouth	88/female	1	DFD
Vilos *et al*.[6]	Maxillary process	58/male	55	AND
Vilos *et al*.[6]	Maxilla	31/male	61	AND
Muzio *et al*.[14]	Tongue	67/male	60	AND
Dios *et al*.[6]	Soft palate	67/male	36	AND
Amarpala and Tilakratne[15]	Tongue	13/male	24	DFD
Amarpala and Tilakratne[15]	R mandible	17/female	LOST	INA
Amarpala and Tilakratne[15]	Mandible	23/male	LOST	INA
Amarpala and Tilakratne[15]	L maxilla	24/male	10	AWD
Amarpala and Tilakratne[15]	Buccal gingival of maxillary canine	30/female	48	DFD
Amarpala and Tilakratne[15]	Tongue and epiglottis	53/female	LOST	INA
Amarpala and Tilakratne[15]	R maxillary antrum	70/male	LOST	INA
Ethunandan *et al*.[16]	Tongue	79/female	28	AND
Ethunandan *et al*.[16]	Tongue	97/female	56	DOC
Ethunandan *et al*.[16]	Maxilla	50/female	18	DFD
Ethunandan *et al*.[16]	Buccal mucosa	51/male	28	AWD
Pinheiro J V *et al*.[17]	Mandible	40/female	11	AND
Yadav R and Bharathan S[1]	Buccal mucosa	27/female	18	AND
Yan *et al*.[18]	R mandible	56/male	15	DFD
Yan *et al*.[18]	R cheek	12/female	8	DFD
Yan *et al*.[18]	Floor of mouth	48/male	17	DFD
Yan *et al*.[18]	R maxilla	63/female	5	DFD
Yan *et al*.[18]	R mandible	46/female	21	DFD
Yan *et al*.[18]	L cheek	16/female	LOST	INA
Yan *et al*.[18]	Left maxilla	25/male	LOST	INA
Yan *et al*.[18]	L mandible	13/male	11	DFD
Yan *et al*.[18]	R cheek	21/female	48	AND
Yan *et al*.[18]	R mandible	34/male	53	AND
Yan *et al*.[18]	L mandible	40/male	LOST	INA
Yan *et al*.[18]	R cheek	11/female	20	AWD
Yan *et al*.[18]	R maxilla	42/male	6	DFD
Yan *et al*.[18]	Hard palate	33/female	7	DFD
Yan *et al*.[18]	L soft palate	55/male	20	AND

AND: Alive with no disease, AWD: Alive with disease, DFD: Died of this disease, DOC: Died of other causes, INA: Information not available, LOST: Lost during follow-up, LMS: Leiomyosarcoma

and centrally placed blunt ended cigar shaped nuclei of varying sizes. Multinucleated giant cells are common. Microscopic criteria for well differentiated LMS include: (i) A pattern of interlacing bundles of smooth muscle cells, (ii) a high mitotic rate, (iii) pleomorphism, and (iv) bizarre cell forms.[21] Immunopositivity for vimentin, SMA, and muscle specific actin MSA has been demonstrated in LMS. Some have also shown immunopositivity for desmin, but this feature is not consistent. The tumor should be immunonegative for S-100 and cytokeratins[22,23] These histopathological features along with immunohistochemical profiles aids in differentiating LMS from other similar spindle cell malignancies like malignant fibrous histiocytoma, fibrosarcoma, etc., [Table 2].

Oral LMS tend to metastasize to the cervical nodes and lungs, and therefore when LMS is identified, it is necessary to determine whether the lesion is primary or secondary.

Table 2: Differential diagnosis and immunohistochemical profile of similar spindle cell tumors[22,23]

Lesions	Histopathological features	IHC markers
Fibrous histiocytoma	Classic storifirm pattern consisting of plump spindle cells in short fascicles around slit like vessels. Shows frequent transition to pleomorphic areas. Characteristically shows large number of multinucleated giant cells with intense eosinophilia	Positive for angiotensin converting enzyme (ACT) and vimetin
Fibrosarcoma	Spindle cells arranged in fascicles with a peculiar herring bone appearance exhibiting low to moderate cellularity. Mild nuclear pleomorphism and rare mitosis, with a collagenous stroma	Only vimentin is positive and negative for all other immuno markers
MPNST	Classically the cells recapitulate the features of normal Schwann cells. The cells can range from spindle to fusiform or even round in shape	Positive for S100, CD57, NGF receptor, EMA, claudin-1, Glut-1
Rhabdomyosarcoma (RMS)	Histologically classified into various types such as embryonal, botryoid, alveolar, pleomorphic, small round cell, and intermediate type. The morphologic indicators of skeletal muscle differentiation, e.g. cross-striations; typical rhabdomyoblasts or areas with small round cell differentiation are seen	MyoD1, myogenin, muscle actins, and desmin positive
Liposarcomas	The tumor predominantly consists of mature fat with a variable number of spindled cells with hyperchromatic nucleus and multivacuolated lipoblasts	S-100, MDM2 positive
Angiosarcoma	Small capillary sized vessels composed of infiltrating malignant cells. The lumen may be empty, filled with clear fluid or engorged with red blood cells	Positive expression of CD31, CD34, FLI-1, von Willebrand factor and ulex lectin
Spindle cell carcinoma	They are biphasic tumors composed chiefly of fascicles of spindle shaped cells with some cells appearing as epithelial elements. Overall picture is similar to that of anaplastic fibrosarcoma with inconspicuous epithelial element	Spindle cells stain positively for cytokeratin and may also show negativity for vimentin

IHC: Immunohistochemical, FLI-1: Friend leukemia integration 1 transcription factor, MDM2: Mouse double minute 2 homolog, EMA: Epithelial membrane antigen, NGF: Nerve growth factor, CD: Cluster of differentiation, MPNST's: Malignant peripheral nerve sheath tumor

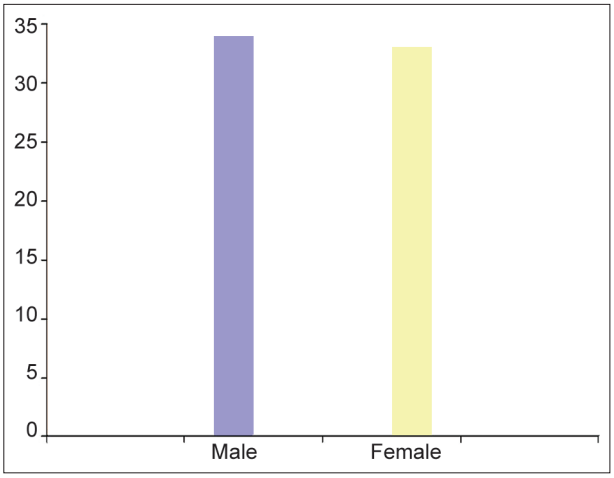

Figure 6: Graph showing sex distribution of primary oral leiomyosarcomas

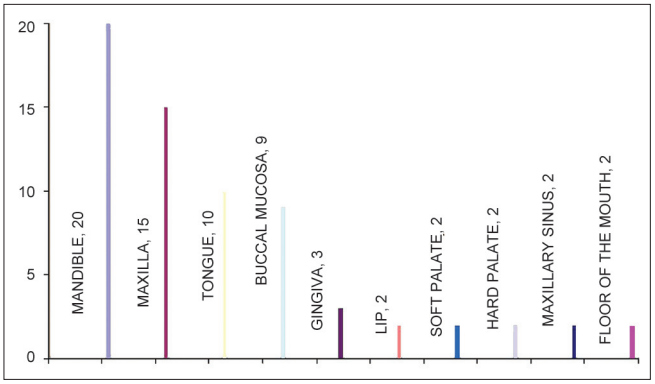

Figure 7: Graph showing sites of occurrence of primary oral leiomyosarcomas

The likelihood of distant metastasis is related to histologic grade and tumor size; the risk is highest for large, high grade lesions.[24] Because of its similarity to other sarcomas composed of spindle cells like fibrosarcoma, neurogenic sarcoma and malignant fibrous histiocytoma, use of special stains and immunohistochemistry becomes of utmost importance for early diagnosis and prompt management of the cases.[14] Early wide surgical excision with radical neck dissection for lymph node metastasis remains the mainstay of treatment.[25] Palliative radiotherapy and chemotherapy have been tried with variable results. Overall the prognosis of LMS is poor and hence early diagnosis is the key to the management.[26]

CONCLUSION

Oral LMS are rare lesions of the head and neck with aggressive behavior and poor prognosis in most of the cases. Appropriate clinical and histopathological evaluation supplemented with immunohistochemistry is a must. Early and accurate diagnosis followed by radical treatment is of utmost importance for improving the prognosis of these tumors.

REFERENCES

1. Yadav R, Bharathan S. Leiomyosarcoma of the buccal mucosa: A case report with immunohistochemistry findings. J Oral Sci 2008;50:215-8.
2. Mesquita RA, Migliari DA, de Sousa SO, Alves MR. Leiomyosarcoma of the buccal mucosa: A case report. J Oral Maxillofac Surg 1998;56:504-7.

3. Gustafson P, Willén H, Baldetorp B, Fernö M, Akerman M, Rydholm A. Soft tissue leiomyosarcoma. A population-based epidemiologic and prognostic study of 48 patients, including cellular DNA content. Cancer 1992;70:114-9.
4. Bishwajit M, Fatema S, Sanjay J, Nidhi S, Sonal S, Ankur B. Leiomyosarcoma of mandible: A case report and review of literature. Int. Journal of Contemporary Dentistry 2010;1:58-63.
5. Schenberg ME, Slootweg PJ, Koole R. Leiomyosarcomas of the oral cavity. Report of four cases and review of the literature. J Craniomaxillofac Surg 1993;21:342-7.
6. Vilos GA, Rapidis AD, Lagogiannis GD, Apostolidis C. Leiomyosarcomas of the oral tissues: Clinicopathologic analysis of 50 cases. J Oral Maxillofac Surg 2005;63:1461-77.
7. Izumi K, Maeda T, Cheng J, Saku T. Primary leiomyosarcoma of the maxilla with regional lymph node metastasis. Report of a case and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995;80:310-9.
8. Krishnan V, Miyaji CM, Mainous EG. Leiomyosarcoma of the mandible: A case report. J Oral Maxillofac Surg 1991;49:652-5.
9. Sumida T, Hamakawa H, Otsuka K, Tanioka H. Leiomyosarcoma of the maxillary sinus with cervical lymph node metastasis. J Oral Maxillofac Surg 2001;59:568-71.
10. Yang SW, Chen TM, Tsai CY, Lin CY. A peculiar site of leiomyosarcoma: The tongue tip – Report of a case. Int J Oral Maxillofac Surg 2006;35:469-71.
11. Mitsudo K, Tohnai I, Fujimoto Y, Sawaki Y, Sugimura T, Nishiguchi H, *et al*. Leiomyosarcoma of the maxilla: effective chemotherapy with docetaxel (DOC) and cisplatin (CDDP) using superselective intra-arterial infusion via superficial temporal artery. Oral Oncol Extra 2006;42:258-62.
12. Centeno CR, Nadini F, Adam R, Godoy H, Reichart PA. Primary leiomyosarcoma of the mandible. Oral Oncology Extra 2006;42:40-5.
13. Carter LC, Aguirre A, Boyd B, DeLacure MD. Primary leiomyosarcoma of the mandible in a 7-year-old girl: Report of a case and review of the literature. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1999;87:477-84.
14. Lo Muzio L, Favia G, Mignogna MD, Piattelli A, Maiorano E. Primary intraoral leiomyosarcoma of the tongue: An immunohistochemical study and review of the literature. Oral Oncol 2000;36:519-24.
15. Amarapala H, Tilakratne WM. Leimyosarcoma of oral cavity: report of seven cases and review of literature. Oral Oncology Extra 2006;42:14-7.
16. Ethunandan M, Stokes C, Higgins B, Spedding A, Way C, Brennan P. Primary oral leiomyosarcoma: A clinico-pathologic study and analysis of prognostic factors. Int J Oral Maxillofac Surg 2007;36:409-16.
17. Pinheiro Jde J, Alves Sde M Jr, Okuda E, Jorge WA, Jaeger RG, de Araújo NS. Primary leiomyosarcoma of the mandible. A case report. Med Oral Patol Oral Cir Bucal 2007;12:E56-59.
18. Yan B, Li Y, Pan J, Xia H, Li LJ. Primary oral leiomyosarcoma: A retrospective clinical analysis of 20 cases. Oral Dis 2010;16:198-203.
19. Piattelli A, Artese L. Leiomyosarcoma of the tongue: A case report. J Oral Maxillofac Surg 1995;53:698-701.
20. Fasanmade AW, Newman L. Primary leimyosarcoma of oral cavity: a case report and review of literature. Can J Plast Surg 2002;10:113-6.
21. Martis C. Leiomyosarcoma of the maxilla: Report of two cases. J Oral Surg 1978;36:62-5.
22. Neville BW, Damm DD, Allen CM, Bouquot JE. Soft Tissue Tumors. Oral and Maxillofacial Pathology. 5th ed. New Delhi: Saunders; 2004. p. 486.
23. Enzinger FM, Weiss SW. Leiomyosarcoma. Soft Tissue Tumors. 2nd ed. New Delhi: B.I. Publications; 1988. p. 402-21.
24. Kang BC, Jang DD, Lee SK. Oral leiomyosarcoma in a woodchuck (*Marmota monax*). J Vet Med Sci 2005;67:353-5.
25. Pellitteri PK, Ferlito A, Bradley PJ, Shaha AR, Rinaldo A. Management of sarcomas of the head and neck in adults. Oral Oncol 2003;39:2-12.
26. Willers H, Hug EB, Spiro IJ, Efird JT, Rosenberg AE, Wang CC. Adult soft tissue sarcomas of the head and neck treated by radiation and surgery or radiation alone: Patterns of failure and prognostic factors. Int J Radiat Oncol Biol Phys 1995;33:585-93.

How to cite this article: Nagpal DJ, Prabhu PR, Shah A, Palaskar S. Leimyosarcoma of the buccal mucosa and review of literature. J Oral Maxillofac Pathol 2013;17:149.

Source of Support: Nil. **Conflict of Interest:** None declared.