Case Report

# Adipocytic tumors of orofacial region: Clinicopathologic appraisal of ten cases with a review of its variants

Nivedita Kaorey, Mandakini Mandale, Jyoti Bhavthankar

Department of Oral Pathology and Microbiology, Government Dental College and Hospital, Aurangabad, Maharashtra, India

**Abstract** Lipomas are the most common benign tumors. However, their presence in oral cavity is albeit erratic. Even scarcer is the prevalence of the various histopathological variants. We, hereby, report the wide range of clinical and histopathologic presentations of these uncommon entities affecting the orofacial region. Discussed herein are six cases of lipomas, two cases of intramuscular lipomas and one case each of osteolipoma and sialolipoma.

**Keywords:** Adipocytic tumors, intramuscular/infiltrating lipoma, lipoma, osteolipoma, sialolipoma

**Address for correspondence:** Dr. Nivedita Kaorey, Department of Oral Pathology and Microbiology, Government Dental College and Hospital, Aurangabad, Maharashtra, India.
E-mail: niveditakaorey@gmail.com
**Received:** 08.01.2020, **Accepted:** 30.01.2020, **Published:** 28.02.2020

## INTRODUCTION

Adipocytic tumors of the oral cavity are most commonly represented as lipomas or herniation of the buccal fat pad.[1] Lipomas are the most common mesenchymal neoplasms normally affecting the trunk and proximal portion of extremities.[2] Fifteen percent of lipomas are found in the head-and-neck region with posterior cervical subcutaneous tissue being the most common site in this span.[3] The overall incidence reported in the oral cavity is 4.4%.[2]

Histologically, it is indistinguishable from normal adipose tissue. Sometimes, these benign tumors contain other mature cell populations such as fibrous, osseous, chondroid and vascular and muscle tissues. Gnepp classified these as simple lipoma, and other variants as fibrolipoma, spindle cell lipoma, intramuscular or infiltrating lipoma, angiolipoma, salivary gland lipoma (sialolipoma), pleomorphic lipoma and myxoid and atypical lipomas.[4] These variants are few and far in between.

Access this article online

Quick Response Code:

Website: www.jomfp.in

DOI: 10.4103/jomfp.JOMFP_8_20

With this context, the aim of the current study was to evaluate the clinical and histopathological features of lipoma cases reported in the past 10 years. This review also deliberates upon some of the histologic variants that were identified during the evaluation.

## CASE REPORT

Archives from the Department of Oral Pathology and Microbiology of the institute spanning from 2008 to 2019 were retrieved, and all cases with histopathological diagnosis of lipoma of the oral cavity were recovered. Data pertaining to patients' gender and age, site, size and duration of the lesions before diagnosis, clinical diagnosis, follow-up and recurrence were obtained from the patients' records. Table 1 gives the detailed demographic, clinical and histopathologic findings of the study cases.

All hematoxylin and eosin stained slides were reviewed and classified as proposed by Gnepp, 2001.[4] The



**How to cite this article:** Kaorey N, Mandale M, Bhavthankar J. Adipocytic tumors of orofacial region: Clinicopathologic appraisal of ten cases with a review of its variants. J Oral Maxillofac Pathol 2020;24:S115-9.

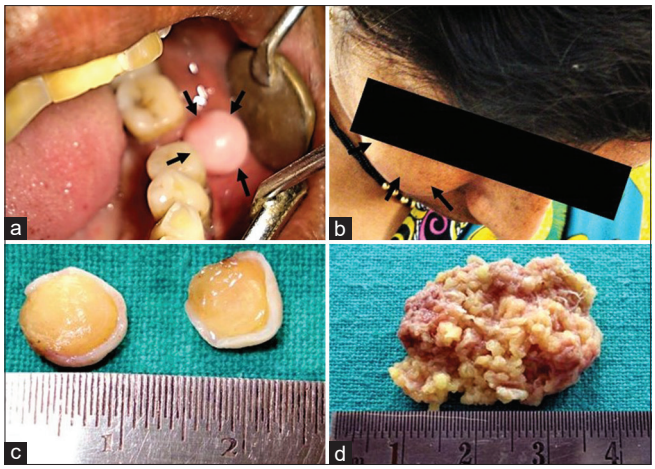


**Figure 1:** Clinical images show (a) Smooth sessile swelling on the left buccal mucosa. (b) Diffuse swelling on the right midface region. (c) Macroscopic appearance of buccal mucosal swelling - cut section reveals wall enclosing yellow shiny content. (d) Macroscopic appearance of midface swelling - irregular surface with severed muscle attachment


**Figure 2:** (a) Macroscopic appearance of simple lipoma showing smooth, slightly lobulated surface. (b) Cut surface of simple lipoma showing yellow, glossy, oligenous surface. (c) Cut surface of osteolipoma showing peripheral bony wall and core containing bony septae filled with lipogenous tissue

data were assessed and subjected to simple descriptive statistics.

The patients' ages varied from the second to seventh decade. Female predilection was noted with the male: female ratio being 3:7. 6 among ten cases showed intraoral location, whereas four were located extraorally. Among the intraoral sites, buccal mucosa and alveolus were involved in two cases each, followed by one case each affecting retromolar trigone and lower labial mucosa. Extraoral sites included midface region, parotid region and submental area. Histopathologically, six cases were simple lipoma, two intramuscular lipomas and one case each of sialolipoma and osteolipoma. Only one case showed multiple lesions, and rest all were solitary lipomas. The recurrence was observed in two cases.

Figures 1 and 2 shows the clinical and gross presentation of the lipomas and Figure 3 depicts their microscopic appearances.

## DISCUSSION

Physiologic reserves of adipose tissue are commonly encountered in submucosa of cheek, tongue and anterolateral part of the hard palate. The adipocytic tumors or the lipomas of the oral cavity are mesenchymal tumors with mature adipose tissue predominance. This adipose tissue component of neoplasms, although structurally similar to normal fat cells, differs metabolically as it cannot be utilized for energy generation during starvation periods as happens with normal adipose tissue.[5]

Initial portrayal of an oral lipoma was provided by Roux (1848), as an alveolar mass which he denoted as "yellow epulis."[6] About 15%–20% of these tumors are testified in the head-and-neck region, with oral cavity involvement observed in 1%–4% of those cases.[7,8] Patients are often asymptomatic and present with a yellowish submucosal mass that may be sessile or pedunculated. It may vary in size, from small masse to large fat lesions. Tongue, mouth floor, buccal mucosa, vestibule, palate, lips and gums are the most common sites, in sliding order.[9] In our observation, buccal mucosa and alveolus were the most commonly affected sites intraorally, whereas the midface region was more pervasive extraorally.

Histologic variants of lipoma include adenolipoma of skin, angiolipoma, cartilaginous metaplasia in a lipoma, chondroid lipoma, fibrolipoma, myelolipoma, myolipoma, myxolipoma, ossifying lipoma and sclerotic lipoma. Variants based on the location include intermuscular lipoma, intramuscular lipoma, parosteal/periosteal lipoma, lipoma arborescens (synovial lipomatosis) and multiple lipomas.[10]

The most widely acknowledged theory for the pathogenesis of lipoma is the "metaplastic theory" which postulates that lipomatous proliferation occurs due to the anomalous differentiation of *in situ* mesenchymal cells into lipoblasts, as adipose tissue can be derived from mutable connective tissue cells at more or less any topographic location in the body. Some authors have also proposed that these are congenital lesions originate from embryonic multipotential cells that remain occultly dormant until they differentiate into fat cells under favorable influence such as hormonal stimuli during adolescence, trauma and chronic inflammation.[11-13]

**Table 1: Demographic, clinical and histopathological findings of the study cases**

| Age/sex | Number | Site | Size (in cm) | Duration (in years) | Clinical diagnosis | Histopathologic variant | Recurrence | Similar lesions elsewhere |
|---|---|---|---|---|---|---|---|---|
| 56/female | Single | Left buccal vestibule | 2×2 | 3 | Benign soft-tissue tumor | Simple lipoma | None up to 2 years | None |
| 71/female | Single | Right mandibular alveolus | 3×3 | 15 | Bony exostosis | Osteolipoma | None up to 2 years | None |
| 32/female | Single | Submental region | 4×4 | 1 | Submental lymphadenopathy | Intramuscular lipoma | None up to 4 years | None |
| 24/male | Multiple | Orofacial region | Ranging from 1 cm to 3-4 cm diameter | 12-13 | Multiple lipomas/ neurofibromatosis | Simple lipoma | Multiple recurrences noted over past 10 years | Neck, upper and lower limbs, back |
| 60/female | Single | Retromolar region | 1×0.8 | 20 | Fibroma | Simple lipoma | None up to 10 years | None |
| 45/female | Single | Right Buccal mucosa | 2×1 | 1-2 | Benign soft-tissue tumor | Simple lipoma | None up to 6 years | None |
| 29/female | Single | Right midface region | 2 | 6 | Lipoma | Intramuscular lipoma | Recurrence after 2 years | None |
| 60/female | single | Left alveolar mucosa | 1×0.5 | 0.6 | Lipoma | Simple lipoma | None up to 3 years | None |
| 44/male | Single | Right preauricular region | 3×4 | 5 | Benign salivary gland neoplasm | Sialolipoma | None up to 10 years | None |
| 13/male | Single | Left lower lip | 1×0.7 | 2 | Mucocele | Simple lipoma | None up to 5 years | None |

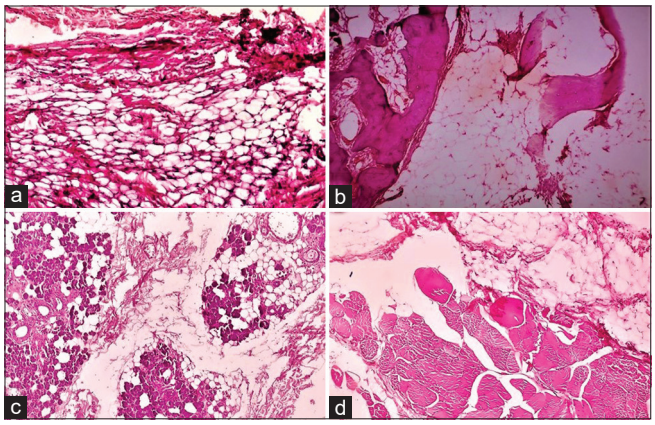


**Figure 3:** Histopathological images show H and E, ×100. (a) Aggregates of clear large round cells with eccentrically pushed nucleus divided by fibrovascular septa (simple lipoma). (b) Irregular trabeculae of woven bone interspersed with numerous adipocytes (osteolipoma). (c) lesional area showing serous salivary gland acini, ductal components and aggregates of adipocytes within fibrovascular stroma (sialolipoma). (d) Transverse and longitudinally cut sections of striated muscle fibers infiltrated with adipose tissue (intramuscular lipoma)

Osteolipomas represent <1% of cases. Even fewer cases have been recounted in the oral cavity with the tongue and lower lip being the commonly affected sites. Further involved sites included the hard palate and the buccal mucosa.[14,15] Age and gender predilections have been inconsistent; however, almost all of the reported cases were in later life. Our case showed involvement of the alveolar area which is first reported in this region.

Osteolipoma also shares its origin on a similar basis of multipotency of mesenchymal cells and potential for metaplastic derivation. Among the two widely cited theories, the first model revolves around the multidirectional differentiation of multipotent mesenchymal cells that justifies the close resemblance of ossifying lipoma to mesenchymoma. Thus, the gist of this concept is that lipoma with osseous tissue is the consequence of bivalent mesenchymal differentiation into bone and adipose tissues since both the tumor components are discontinuous within the mass.[16]

The second doctrine is more in favor of metaplasia of fibrous elements into osseous tissue, ancillary to the existing simple lipoma. This metaplasia is attributed to various external factors such as mechanical stress, repeated trauma or ischemia.[17] Apart from these two suppositions, it has also been suggested that osteolipomas arise due to mediators released by monocytes in the circulation that induce the transformation of fibroblasts into osteoblasts or perhaps due to a scant nutritional supply in the center of a large lipoma.[17,18] Chromosomal abnormalities of 12q14–15,6p and 13q9 have also been inferred as a possible etiology.[3]

Sialolipoma is a comparatively newfound histological variant of lipoma characterized by benign salivary gland parenchyma interspersed with mature adipose tissue.[19] Its pathogenesis may be correlated with salivary gland dysfunction that may modify the salivary gland structure. This alteration may result in substitution of normal salivary gland tissue with mature adipose tissue together with atrophic salivary glandular elements and/or chronic ductal epithelial changes such as oncocytic metaplasia, fibrosis and lymphocytic infiltrate.[20]

The third variant we came across was intramuscular/infiltrating lipoma. These are the deep-seated variants that are localized deep under the enclosing fascia.[21] Intramuscular lipoma is another uncommon

condition that represents just over 1.8% of all primary tumors of adipose tissue and <1% of all lipomas.[22] In the orofacial regions, the involvement of different muscles such as tongue, cheek, orbicularis muscle and temporalis muscle has been described with the tongue being one of the most commonly involved sites.[21] In our study, the midface region and submental region were involved. The pathogenesis of intramuscular lipoma is assumed to be similar to other lipoma subtypes.[23]

Immunohistochemical evaluation of different variants using Ki-67 and PCNA was done by Naruse *et al*. PCNA and ki-67 were detected in the nuclei of mature fat cells. They found the expression in fibrolipomas and intramuscular lipomas to be higher than classic lipomas. However, no significant difference was observed in their behavior postoperatively.[2] Stojanov *et al*. (2019) employed MDM2 and CDK4 immunohistochemical expression in adipocytic tumors in conjunction with the histiocytic marker to avoid overdiagnosis of lipomas as atypical lipomatous tumor.[1] White fat in lipoma can be differentiated from brown fat in hibernoma through immunohistochemistry as adipose cells in lipomas are positive for S-100α and S-100 β, whereas tumor cells in hibernoma display an intense positive staining for CD319.[7]

The treatment advocated for all lipomas is simple excision as recurrence is rare with these entities. An exception to this is the intramuscular variant, wherein a recurrence rate between 3% and 62.5% has been reported.[21]

Newer treatment modalities are in pipeline as a prospective approach, which have included photodynamic therapy with the help of endoscopic device which facilitates delivery of inducing factors, such as ultraviolet light, interleukin 1, tumor necrosis factor and dexamethasone, are brought into contact with undesired fat cells.[19]

A new inkling worth pondering has arose with the advent of adipokines such as leptin. Tissue engineers are considering these adipose tissue reserves as a source of adult stromal/stem cells which can be harvested by collagenase digestion. The multipotency has bestowed them with the ability to differentiate through the adipocyte, chondrocyte, osteoblast and other lineage pathways implying their role in regenerative therapies. These adipose cells also discharge numerous cytokines and growth factors with possible paracrine actions, thus insinuating their role in treating diabetic conditions. Furthermore, adipocytes have exhibited immunomodulatory functions when added to mixed lymphocyte reactions, cueing that they may be transplanted allogeneically.[20]

Thus, a new prospect has been unwrapped to view these adipocytic entities in a different light.

## CONCLUSION

Not only are the adipocytic tumors of the oral cavity unusual entities afflicting the oral cavity, their utility in therapeutics can also not be refuted. Thus, careful diagnosis of these lesions may provide some insight in the field of therapeutics in future.

### Financial support and sponsorship
Nil.

### Conflicts of interest
There are no conflicts of interest.

## REFERENCES

1. Stojanov IJ, Mariño-Enriquez A, Bahri N, Jo VY, Woo SB. Lipomas of the oral cavity: Utility of MDM2 and CDK4 in avoiding overdiagnosis as atypical lipomatous tumor. Head Neck Pathol 2019;13:169-76.
2. Naruse T, Yanamoto S, Yamada S, Rokutanda S, Kawakita A, Takahashi H, *et al*. Lipomas of the oral cavity: Clinicopathological and immunohistochemical study of 24 cases and review of the literature. Indian J Otolaryngol Head Neck Surg 2015;67:67-73.
3. Sathyaki DC, Roy MS. Lipomas of head and neck. Int J Otorhinolaryngol Head Neck Surg 2018;4:368-71.
4. Gnepp DR, editor. Diagnostic Surgical Pathology of the Head and Neck. Philadelphia: W.B. Saunders; 2001.
5. Epivatianos A, Markopoulos AK, Papanayotou P. Benign tumors of adipose tissue of the oral cavity: A clinicopathologic study of 13 cases. J Oral Maxillofac Surg 2000;58:1113-7.
6. Rajendran R, Sivapathasundharam B. Shafer's Textbook of Oral Pathology. 5th ed. India: Elsevier; 2009.
7. Srivastava A, Vijayalakshmi K, Khan M. Lipoma; a rarity in the oral cavity: A case report. J Oral Med Oral Surg Oral Pathol Oral Radiol 2016;2:85-7.
8. de Visscher JG. Lipomas and fibrolipomas of the oral cavity. J Maxillofac Surg 1982;10:177-81.
9. Vasconcelos BC, Porto GG, Carneiro SC, Xavier RL. Lipomas of the oral cavity. Rev Bras Otorrinolaringol 2007;6:848.
10. Rouse RV. Lipoma. Surgical Pathology Criteria; 2017. Available from: http://surgpathcriteria.stanford.edu/softfat/lipoma/. [Last accessed on 2019 Dec 29].
11. Kumar LK, Kurien NM, Raghavan VB, Menon PV, Khalam SA. Intraoral lipoma: A case report. Case Rep Med 2014;2014:480130.
12. Lin JJ, Lin F. Two entities in angiolipoma. A study of 459 cases of lipoma with review of literature on infiltrating angiolipoma. Cancer 1974;34:720-7.
13. Fregnani ER, Pires FR, Falzoni R, Lopes MA, Vargas PA. Lipomas of the oral cavity: Clinical findings, histological classification and proliferative activity of 46 cases. Int J Oral Maxillofac Surg 2003;32:49-53.
14. de Castro AL, de Castro EV, Felipini RC, Ribeiro AC, Soubhia AM. Osteolipoma of the buccal mucosa. Med Oral Patol Oral Cir Bucal 2010;15:e347-9.
15. Firth NA, Allsobrook O, Patel M. Osteolipoma of the buccal mucosa: A case report. Aust Dent J 2017;62:378-81.
16. Rombado BR, Madewell JE, Aslam R, Mujtaba B. Ossifying lipoma: Literature review and analysis of radiological imaging. Imaging Med 2018;10:63-7.

17. Heffernan EJ, Lefaivre K, Munk PL, Nielsen TO, Masri BA. Ossifying lipoma of the thigh. The British J Radiology 2008;81:e207-10.
18. Blanshard JD, Veitch D. Ossifying lipoma. J Laryngol Otol 1989;04:429-31.
19. Nagao T, Sugano I, Ishida Y, Asoh A, Munakata S, Yamazaki K, *et al*. Sialolipoma: A report of seven cases of a new variant of salivary gland lipoma. Histopathology 2001;38:30-6.
20. Akrish S, Leiser Y, Shamira D, Peled M. Sialolipoma of the salivary gland: Two new cases, literature review, and histogenetic hypothesis. J Oral Maxillofac Surg 2011;69:1380-4.
21. McTighe S, Chernev I. Intramuscular lipoma: A review of the literature. Orthop Rev (Pavia) 2014;6:5618.
22. Fletcher CD, Martin-Bates E. Intramuscular and intermuscular lipoma: Neglected diagnoses. Histopathology 1988;12:275-87.
23. Ramos-Pascua LR, Guerra-Álvarez OA, Sánchez-Herráez S, Izquierdo-García FM, Maderuelo-Fernández JÁ. Intramuscular lipomas: Large and deep benign lumps not to underestimated. Review of a series of 51 cases. Rev Esp Cir Ortop Traumatol 2013;57:391-7.