A simultaneous presentation of uncommon, pigmented lesions: Oral melanoacanthoma and moderate oral epithelial dysplasia

Carlo Sgarbanti*, DDS, MDent(Perio); **Carla Penner**§, DDS, FRCD(C); **Vimi S Mutalik**†, BDS, MS, FRCD(C)

PRACTICAL IMPLICATIONS OF THIS RESEARCH

- This report increases awareness of pigmented lesions in the oral cavity that can present with similar clinical appearance but have a different final diagnosis.
- These lesions, although uncommon, can be encountered in everyday practice by dental hygienists and dentists.
- Suspicious lesions should be referred for biopsy to rule out the risk of malignancies.

ABSTRACT

Introduction: Melanin-containing mucosal lesions can present a diagnostic challenge due to the presence of a wide range of lesions with a similar clinical appearance. **Case description:** This is a report of a unique case of the simultaneous presentation of 2 pigmented lesions in a 68-year-old white female patient. **Discussion:** The first pigmented lesion on the ventral tongue was diagnosed as melanoacanthoma, which does not have any potential for malignant transformation. The ventral tongue is a very unusual location for a melanoacanthoma. Interestingly, another lesion on the buccal mucosa with a similar appearance presented as moderate epithelial dysplasia with increased melanin pigment that has the potential for malignant transformation. Pigmented moderate oral epithelial dysplasia is a very rare condition. The simultaneous presence of a melanoacanthoma would have led to a mistaken assumption of multifocal melanoacanthoma which, although rare, has been described in the literature. **Conclusion:** These findings reinforce that it is prudent to perform multiple biopsies of all suspicious oral lesions.

RÉSUMÉ

Introduction : Les lésions muqueuses contenant de la mélanine peuvent présenter un défi diagnostique en raison de la présence d'un large éventail de lésions ayant un aspect clinique similaire. **Description du cas :** Le présent rapport fait état d'un cas unique de la présentation simultanée de 2 lésions pigmentées chez une patiente blanche âgée de 68 ans. **Discussion :** Le diagnostic de la première lésion pigmentée sur la langue ventrale est celui d'un mélanoacanthome, qui n'a pas de potentiel de transformation maligne. Il est très rare qu'un mélanoacanthome se trouve sur la partie ventrale de la langue. Fait intéressant, une autre lésion de la muqueuse buccale d'apparence similaire s'est révélée être une dysplasie épithéliale modérée avec une augmentation du pigment mélanique qui présente un potentiel de transformation maligne. La dysplasie épithéliale buccale modérée pigmentée est une affection très rare. La présence simultanée d'un mélanoacanthome aurait mené à l'hypothèse erronée d'un mélanoacanthome multifocal qui, bien que rare, a été décrit dans la documentation. **Conclusion :** Ces résultats confirment qu'il est prudent d'effectuer des biopsies multiples de toutes les lésions buccales suspectes.

Keywords: mouth; oral; oral melanoacanthoma; pigmented lesions; pigmented moderate oral epithelial dysplasia
CDHA Research Agenda category: risk assessment and management

INTRODUCTION

Melanin-containing mucosal lesions can pose a diagnostic challenge due to their ability to mimic various lesions with a similar clinical appearance.[1] Oral mucosal pigmented lesions are broadly divided based on their clinical presentations into 2 categories: focal and diffuse. Common considerations in the diagnosis of focal lesions include amalgam tattoo, melanocytic nevus, melanotic macule, and malignant melanoma. The lesions with a diffuse presentation include, but are not limited to physiologic pigmentation, smoker's melanosis, drug-induced pigmentation, and post inflammatory melanosis.[2]

A less common pigmented lesion that can be included in the differential diagnosis when assessing unexplained oral pigmentation is oral melanoacanthoma. Oral melanoacanthoma is generally a focal lesion, and it is a rare, benign, reactive, pigmented lesion characterized by hyperplasia of spinous keratinocytes and dendritic melanocytes.[3]

This short communication reports a unique case of the simultaneous presentation of 2 pigmented lesions in a

*Department of Dental Diagnostic and Surgical Sciences, Dr Gerald Niznick College of Dentistry, Rady Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, Canada
§Department of Pathology, Max Rady College of Medicine, Rady Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, Canada
†Department of Dental Diagnostic and Surgical Sciences, Dr Gerald Niznick College of Dentistry, Rady Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, Canada

Correspondence: Dr. Carlo Sgarbanti; carlo.sgarbanti@umanitoba.ca
Manuscript submitted 12 March 2024; revised 1 July and 22 November 2024; accepted 9 December 2024

68-year-old white female patient. This report increases awareness among oral health practitioners of the varied presentations of pigmented lesions in the oral cavity and emphasizes the importance of performing multiple biopsies in these clinical scenarios.

CASE DESCRIPTION

In September 2019, a 68-year-old white female presented to the Graduate Periodontal Clinic, Faculty of Dentistry, University of Manitoba, in Winnipeg, Canada, for evaluation of pigmented lesions on the left ventral tongue and the left posterior buccal mucosa. These lesions were detected in the Undergraduate Clinic of the same institution 2 weeks earlier. However, no clinical photos were included in the referral form. Both lesions were asymptomatic, and the patient was unaware of them until her dental student noticed the change. The patient presented with a 20-year history of heavy smoking, which she claimed included approximately 20 cigarettes a day, but no history of any occupational exposure. Additionally, she reported recreational alcohol consumption. The patient claimed that she had stopped smoking the previous year but clinical findings and notes from the referring dental student did not confirm this statement. Her medical history was significant for depression, anxiety, hypothyroidism, and hypertension and her medications included Apo-olanzapine, Mint-quetiapine, Teva-sertraline, Teva-perindopril, and Synthroid.

The extraoral examination was unremarkable. Intraorally, there were 2 dark pigmented macules, one on the left ventral surface of the tongue and the other on the left buccal mucosa. The lesion on the left ventral tongue showed a macule measuring 7 mm × 5 mm, was brown in colour with ill-defined borders and a non-homogeneous distribution of pigments (Figure 1). The lesion on the left buccal mucosa measured 1 mm × 1.5 mm, was brown/black in colour, and appeared mildly elevated. (Figure 2). The patient denied any history of trauma to these sites. The remainder of the oral mucosa was within normal limits. Considering that the patient was a smoker, this smaller lesion on the buccal mucosa was initially suspected to be consistent with smoker's melanosis. The lesion was documented in the patient's chart and a clinical photo was taken. The patient stated that she would stop smoking, and a follow-up appointment was scheduled in 3 weeks.

Given the larger size and non-homogeneous appearance of the lesion on the ventral tongue, an excisional biopsy of this lesion was performed during the first appointment. Due to the dimensions of the lesion (<10 mm), since malignant lesions were not on the clinical differential diagnosis and the anatomical location allowed the inclusion of uninvolved surrounding margins around the lesion, an excisional biopsy approach was chosen.[4] Histologically the surface epithelium was hyperkeratotic and hyperplastic with significant melanocytic distribution (Figure 3, Figure 4, Figure 5). Immunohistochemical analysis highlighted the dendritic processes by MART-1, HMB45, and SOX-10. The dendritic melanocytes were distributed throughout the epithelium without nesting or confluence. PRAME was negative. Ki-67 showed the epithelial proliferation confined to the basal cell layer (Table 1). The overall features are best described as epithelial acanthosis with increased intraepithelial dendritic melanocytes; the final diagnosis was an oral melanoacanthoma. The patient did not report any bleeding or discomfort and healed without recurrence of the lesion.

The patient missed multiple recall appointments and did not reply to phone calls for several months. The patient's clinical records showed a history of erratic compliance over the years. In September 2020, the patient returned. The lesion on the ventral tongue showed no signs of relapse or recurrence (Figure 6).

The pigmented lesion on the left buccal mucosa, first noted almost a year before, appeared clinically unchanged (Figure 7). However, the lesion was excised at this appointment due to presentation of the first lesion at an unusual site. The histopathology showed portions of mucosa lined by hyperplastic stratified squamous epithelium. The epithelium showed budding of rete ridges, disorganization of the basal layer, and an abnormal maturation sequence. These dysplastic features were extending up to the middle third of the epithelium. There was melanin incontinence in the underlying lamina propria (Figure 8, Figure 9). The lateral surgical margins were uninvolved. Taken together, the cytologic and architectural features of this specimen were consistent with moderate dysplasia,[5] with increased melanin and a malignant transformation rate of 10.3%. The two discrete pigmented lesions had very different pathologic features and separate diagnoses. The patient returned for a 1-month follow-up and the left buccal mucosal lesion healed with no signs of recurrence (Figure 10).

DISCUSSION

Pigmentations in the oral mucosa can be the result of race, medications, and systemic conditions.[6,7] In 1927, Bloch[8] described hyperpigmented lesions as benign non-nevoid melanoepithelioma of the skin and subdivided it into 2 types. Type I consists of a mixture of basal cells, prickle cells, and highly dendritic melanocytes; type II is composed mainly of deeply pigmented small cells of basal type.[8] Years later, in 1960, Mishima et al.[9] replaced the term Bloch Type I lesion with melanoacanthoma to describe this rare, benign lesion which represents 0.9% of melanocytic lesions of the oral mucosa. Clinically, melanoacanthomas are commonly seen on the skin of the head and neck region, upper extremities, and oral mucosa.[10] Some authors[3,11] have highlighted the

Figure 1. Pigmented macule on the left lateral tongue (Lesion 1)

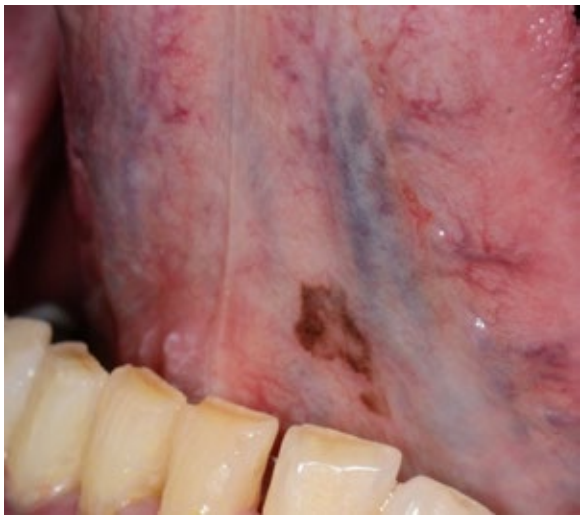

Figure 2. Pigmented macule on the left buccal mucosa (Lesion 2)

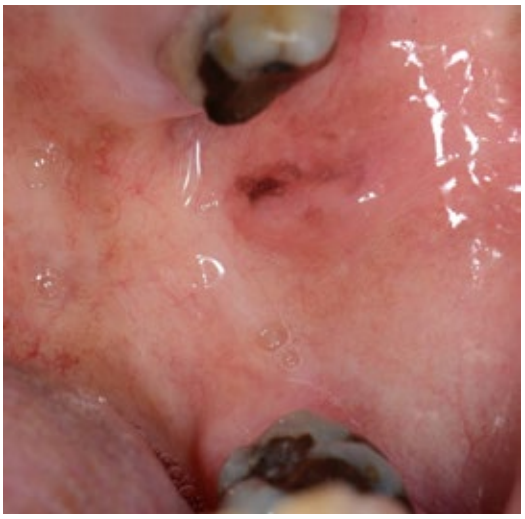

Figure 3. Ventral tongue lesion (Lesion 1). Low-power view showing hyperplastic surface epithelium without significant atypia (H and E, 10× magnification)

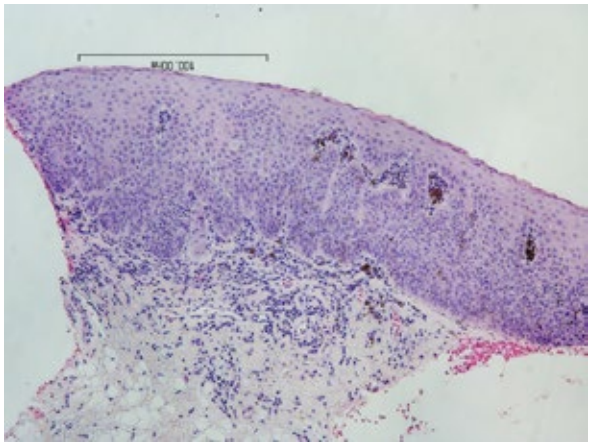

Figure 4. Ventral tongue lesion (Lesion 1). Mild acanthosis with presence of melanocytes at all levels of the epithelium (H and E, 20× magnification)

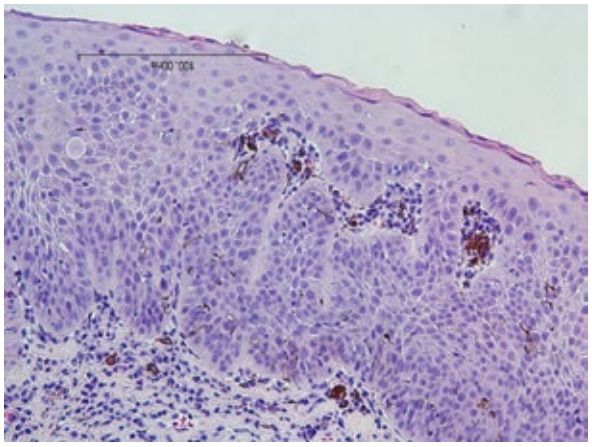

Figure 5. Ventral tongue lesion (Lesion 1). High-power view showing the radiating dendritic processes of the melanocytes (H and E, 40× magnification)

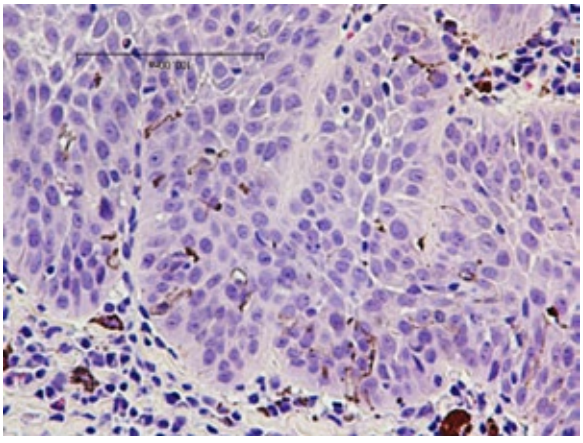

Figure 6. Two-week follow-up of the lesion on the ventral tongue (Lesion 1)

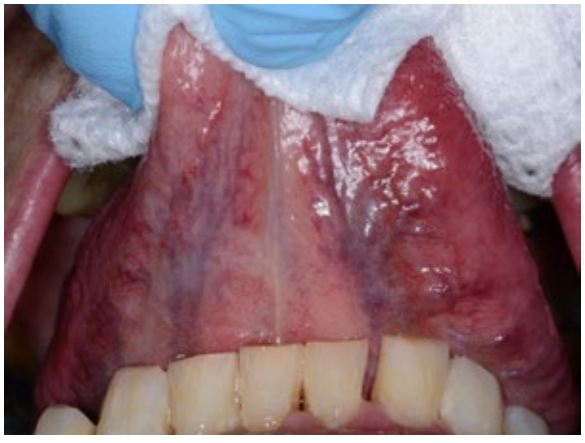

Figure 7. One-year follow-up of the pigmented macule on the left buccal mucosa (Lesion 2)

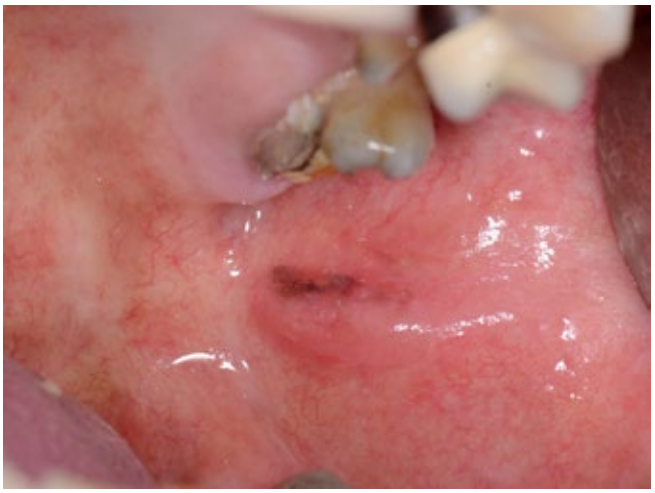

Figure 8. Buccal mucosa lesion (Lesion 2). Low-power view showing the architectural and cytological features of dysplasia extending to the middle third of the epithelium (H and E, 10× magnification)

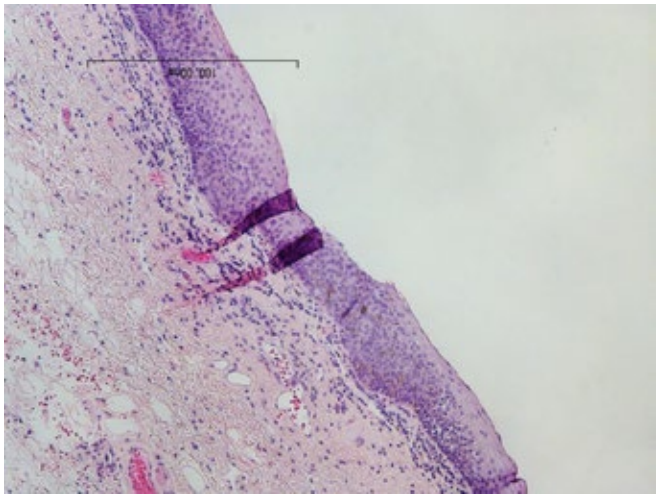

Figure 9. Buccal mucosa lesion (Lesion 2) showing abnormal maturation pattern in the epithelium interspersed with melanin pigmentation and melanin incontinence (H and E, 20× magnification)

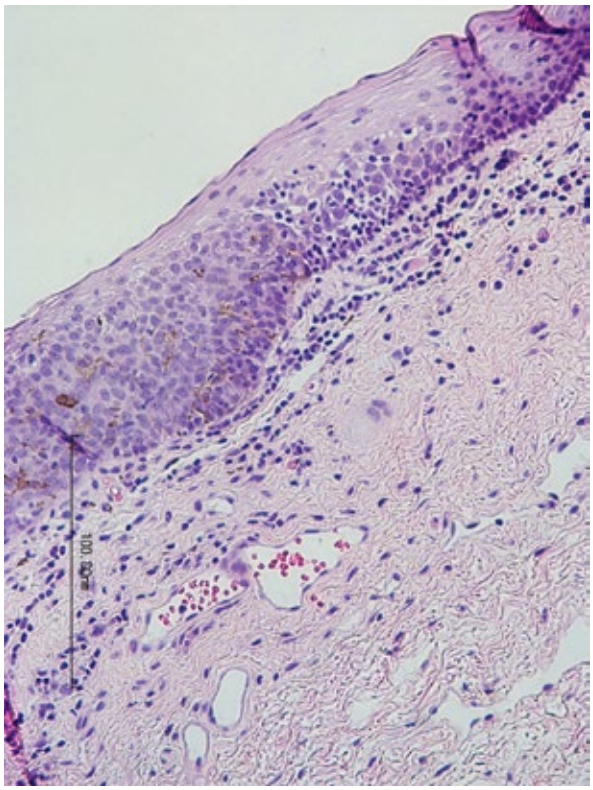

Figure 10. One-month follow-up of the lesion on the left buccal mucosa (Lesion 2)

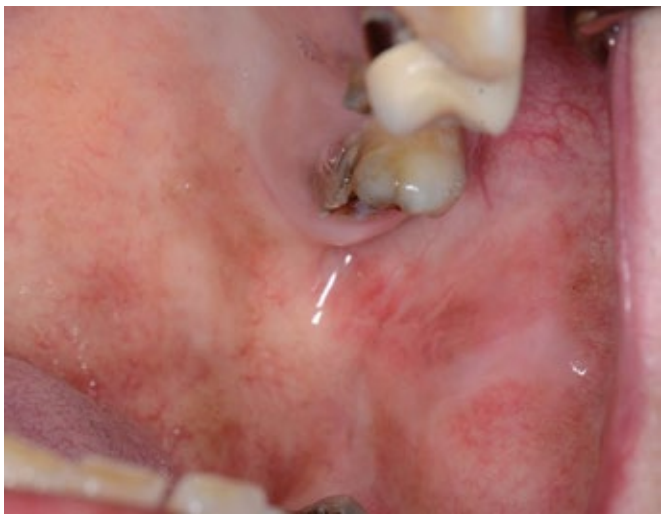

Table 1. Immunohistochemical glossary of terms used in the article[24]

PRAME: preferentially expressed antigen in melanoma. This gene encodes an antigen that is predominantly expressed in human melanomas and that is recognized by cytolytic T lymphocytes. It is not expressed in normal tissues, except testis.
HMB-45: a monoclonal antibody that reacts against an antigen present in melanocytic tumours such as melanomas and stands for human melanoma black.
MART-1 antigen: a protein found on normal melanocytes (cells that make the pigment melanin) in the skin and in the retina. It is also found on most melanomas (cancers that begin in melanocytes).
SOX10 (SRY-box transcription factor 10): a nuclear transcription factor that plays an important role in Schwannian and melanocytic cell differentiation and has been shown to be a useful marker in the diagnosis of melanocytic and Schwannian tumours. SOX10 is expressed in benign melanocytic naevi and melanomas, including desmoplastic melanoma and spindle cell melanoma.
Ki-67 protein: a cellular marker for proliferation.

difference in presentations of melanoacanthomas of the skin compared to the oral mucosa. Melanoacanthomas of the skin often present in older white individuals.[10] In contrast, oral melanoacanthomas are mostly seen in younger individuals, mean age of 35 years,[12] in Black individuals,[12] and are usually asymptomatic. They often show a female predilection with, in most cases, a prior history of trauma or irritation. The buccal mucosa and palate are the most common sites.[10,12] However, rare presentations of lip, gingiva, vermilion border, retromolar pad, and alveolar mucosa are also reported.[3,13,14] Cases with multifocal lesions involve the buccal mucosa and gingiva.[15] About 50% of these lesions show rapid growth and rarely cause pain.[10] The colour ranges from dark blue to brown and black[10] and the size ranges from 2 mm to 50 mm in greatest diameter.[15] Histologically, lesions are characterised by keratinocytes and numerous large melanocytes with dendritic processes that are cytologically bland[16,17] and unusually large[9]. Because several cases are associated with inflammation, the oral melanoacanthomas are reactive in nature. Surgical excision is the treatment of choice and recurrence is unlikely.[11,12]

Given the clinical similarities and rapid growth of melanocytic lesions, a biopsy is mandatory to confirm the final diagnosis[18,19] and to rule out the risk of oral melanoma. Clinically, melanotic macule, melanocytic nevus, and drug-induced pigmentation were considered for both lesions.[2] However, the tongue is an unusual location for any of the above clinical differential diagnoses. This case is unique for multiple reasons: an older white female, no prior history of trauma, and presentation of the lesion in an unusual location such as ventral tongue. In 2004, Buchner et al.[13] retrospectively evaluated 773 solitary pigmented melanocytic lesions; 7 cases, 0.9% of these lesions, were diagnosed as oral melanoacanthoma. This was the first paper reporting oral melanoacanthoma in Asian patients and the first to report the tongue as a

Table 2. World Health Organization criteria for epithelial dysplasia[21]

Architectural changes	Cellular changes
Irregular epithelial stratification	Abnormal variation in nuclear size
Altered polarity or disorganization of basal cells	Abnormal variation in nuclear shape
Drop-shaped rete processes	Abnormal variation in cell size
Basal cell clustering/nesting	Abnormal variation in cell shape
Expanded proliferative compartment	Increased mitotic activity
Mitosis high in epithelium	Increased nuclear size
Mitosis in maturing cells	Increased N:C ratio
Generalized premature keratinization	Atypical mitotic figures
Keratin pearls in the Rady processes	Increased number and size of nucleoli
Reduced keratinocyte cohesion	Single cell keratinization
Altered keratin pattern of oral subside	Nuclear hyperchromasia
Verrucous or papillary architecture	Karyorrhectic and apoptotic cells
Extension of changes along minor gland ducts	
Sharply defined margin to changes	
Multiple different patterns of dysplasia	
Multifocal or skip lesions	

location of the lesion. In 2009, Marocchio et al.[20] presented a case report of a Black woman with an unusual case of multifocal melanoacanthomas involving the whole oral cavity including the tongue. Therefore, to date, only 2 cases of melanoacanthoma of the tongue have been published; this short communication documents the third case.

Interestingly, the lesion from the buccal mucosa had different characteristics from the lesion biopsied in the ventral tongue and, according to the World Health Organization's classification[21] (Table 2), it was diagnosed as moderate dysplasia with increased melanin. Oral epithelial dysplasia presenting as a pigmented macule is unusual. Martins et al.[22] reported a case of pigmented carcinoma in situ involving the soft palate in a Black patient. Pain and presence of bleeding have been reported in some cases.[22,23] Matsumoto et al.[23] reported a case of pigmented carcinoma in situ, which presented as a mixed white and brown entity on the lateral tongue. Research suggest that the neoplastic cells produce growth factors that induce proliferation of melanocytes and stimulate melanin production.[23] Due to the very limited number of reports of pigmented oral epithelial dysplasia/pigmented carcinoma in situ in the oral cavity, the biological behaviour of these lesions is still not well understood.[23]

CONCLUSION

The 2 clinically similar pigmented lesions reported here proved to be totally divergent entities. These findings reinforce that it is prudent to perform a biopsy of all suspicious oral lesions. The ventral tongue lesion was a melanoacanthoma that does not have any potential for malignant transformation. In contrast, the lesion from the buccal mucosa was pigmented moderate epithelial dysplasia with increased melanin pigment. This lesion does have the potential for malignant transformation. The simultaneous presence of a melanoacanthoma may have misled some oral health professionals to an assumption of multifocal melanoacanthoma which, although rare, has been described in the literature. This patient will be kept under long-term follow-up to monitor these sites and to assess for development of any new lesions.

ACKNOWLEDGEMENTS

We would like to acknowledge Dr. Paul Freedman and Dr. Renee Reich (Oral Pathology Laboratory, Inc., New York) for providing second opinions on the final diagnoses. This study was not supported by any funding.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

INFORMED CONSENT

The patient described in this short communication signed informed consent regarding publishing their data and photographs.

REFERENCES

1. Kaugars GE, Heise AP, Riley WT, Abbey LM, Svirsky JA. Oral melanotic macules. a review of 353 cases. *Oral Surg Oral Med Oral Pathol.* 1993;76(1):59–61. doi:10.1016/0030-4220(93)90295-f
2. Lambertini M, Patrizi A, Fanti PA, et al. Oral melanoma and other pigmentations: when to biopsy? *J Eur Acad Dermatol Venereol.* 2018;32(2):209–214. doi:10.1111/jdv.14574
3. Carlos-Bregni R, Contreras E, Netto AC, et al. Oral melanoacanthoma and oral melanotic macule: a report of 8 cases, review of the literature, and immunohistochemical analysis. *Med Oral Patol Oral Cir Bucal.* 2007;12(5):E374–E379.
4. Oliver RJ, Sloan P, Pemberton MN. Oral biopsies: methods and applications. *Br Dent J.* 2004;196(6):329–33; quiz 362. doi:10.1038/sj.bdj.4811075
5. Ellonen R, Suominen A, Kelppe J, Willberg J, Rautava J, Laine H. Histopathological findings of oral epithelial dysplasias and their relation to malignant transformation. *Cancer Treat Res Commun.* 2023;34:100664. doi:10.1016/j.ctarc.2022.100664
6. Gaeta GM, Satriano RA, Baroni A. Oral pigmented lesions. *Clin Dermatol.* 2002;20(3):286–88. doi:10.1016/s0738-081x(02)00225-0
7. Yuan A, Woo SB. Adverse drug events in the oral cavity. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2015;119(1):35–47. doi:10.1016/j.oooo.2014.09.009
8. Bloch Br. Über benigne, nicht naevoide Melanoepitheliome der Haut nebst Bemerkungen über das Wesen und die Genese der Dendritenzellen. *Archiv für Dermatologie und Syphilis.* 1927;153(1):20–40. doi:10.1007/BF01828960
9. Mishima Y, Pinkus H. Benign mixed tumor of melanocytes and malpighian cells. Melanoacanthoma: Its relationship to Bloch's benign non-nevoid melanoepithelioma. *Arch Dermatol.* 1960;81:539–50. doi:10.1001/archderm.1960.03730040043009
10. Goode RK, Crawford BE, Callihan MD, Neville BW. Oral melanoacanthoma. Review of the literature and report of ten cases. *Oral Surg Oral Med Oral Pathol.* 1983;56(6):622–28. doi:10.1016/0030-4220(83)90080-4
11. Wright JM. Intraoral melanoacanthoma: a reactive melanocytic hyperplasia. Case report. *J Periodontol.* 1988;59(1):53–55. doi:10.1902/jop.1988.59.1.53

12. Galindo-Moreno P, Padial-Molina M, Gómez-Morales M, Aneiros-Fernández J, Mesa F, O'Valle F. Multifocal oral melanoacanthoma and melanotic macula in a patient after dental implant surgery. *J Am Dent Assoc*. 2011;142(7):817–24. doi:10.14219/jada.archive.2011.0270

13. Buchner A, Merrell PW, Carpenter WM. Relative frequency of solitary melanocytic lesions of the oral mucosa. *J Oral Pathol Med*. 2004;33(9):550–57. doi:10.1111/j.1600-0714.2004.00238.x

14. Dantas TS, Nascimento IV do, Verde MEQL, Alves APNN, Sousa FB, Mota MRL. Multifocal oral melanoacanthoma associated with Addison's disease and hyperthyroidism: a case report. *Arch Endocrinol Metab*. 2017;61(4):403–407. doi:10.1590/2359-3997000000273

15. Yarom N, Hirshberg A, Buchner A. Solitary and multifocal oral melanoacanthoma. *Int J Dermatol*. 2007;46(12):1232–1236. doi:10.1111/j.1365-4632.2007.03393.x

16. Matsuoka LY, Barsky S, Glasser S. Melanoacanthoma of the lip. *Arch Dermatol*. 1982;118(5):290.

17. Fornatora ML, Reich RF, Haber S, Solomon F, Freedman PD. Oral melanoacanthoma: a report of 10 cases, review of the literature, and immunohistochemical analysis for HMB-45 reactivity. *Am J Dermatopathol*. 2003;25(1):12–15. doi:10.1097/00000372-200302000-00003

18. Wright JM, Binnie WH, Byrd DL, Dunsworth AR. Intraoral melanoacanthoma. *J Periodontol*. 1983;54(2):107–111. doi:10.1902/jop.1983.54.2.107

19. Peters SM, Mandel L, Perrino MA. Oral melanoacanthoma of the palate: an unusual presentation of an uncommon entity. *JAAD Case Rep*. 2018;4(2):138–39. doi:10.1016/j.jdcr.2017.11.023

20. Marocchio LS, Júnior DSP, de Sousa SCOM, Fabre RF, Raitz R. Multifocal diffuse oral melanoacanthoma: a case report. *J Oral Sci*. 2009;51(3):463–66. doi:10.2334/josnusd.51.463

21. WHO Classification of Tumours Editorial Board. *Head and Neck Tumours, WHO Classification of Tumours,* 5th ed, vol 9. Lyon, France: International Agency for Research on Cancer; 2024. Available from: publications.iarc.fr/

22. Martins F, Mistro FZ, Kignel S, Palmieri M, do Canto AM, Braz-Silva PH. Pigmented squamous cell carcinoma in situ: report of a new case and review of the literature. *J Clin Exp Dent*. 2017;9(11):e1362–e1365. doi:10.4317/jced.54053

23. Matsumoto N, Kitano T, Oki H, et al. Pigmented oral carcinoma in situ: a case report and literature review. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2014;118(3):e79–e83. doi:10.1016/j.oooo.2014.01.230

24. Saleem A, Narala S, Raghavan SS. Immunohistochemistry in melanocytic lesions: Updates with a practical review for pathologists. *Semin Diagn Pathol*. 2022;39(4):239–47. doi:10.1053/j.semdp.2021.12.003