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# Multiple superficial mucoceles on the lower lip of a patient with phenylketonuria: A case report

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**ABSTRACT**

This article reports a 13-year-old boy with phenylketonuria and multiple superficial mucoceles on his lower lip. Phenylketonuria (PKU) is a serious and rare genetic disorder that affects the levels of amino acids such as phenylalanine in the body. If left untreated, PKU can negatively affect mental function and cause retardation. Patients with PKU receive less oral examination compared to the normal population. Mucoceles are lesions formed by the accumulation of mucous of salivary glands in soft tissue by blockage or extravasation. Local trauma has been identified as the main cause of mucoceles development. Superficial mucoceles are rare in the lower lip. These patients need close oral and maxillofacial examination to find problems, which may be related to their systemic problem. Micro-marsupialization is a conservative therapeutic approach for management of pediatric oral mucoceles. Management of trauma in patients with mental retardation is an important issue.

**Keywords:** Mucocele; Phenylketonuria; Genetic disorder; lower lip; Salivary gland.

## Introduction

Phenylketonuria (PKU) is a relatively rare genetic metabolic disorder, caused by faulty genes for phenylalanine hydroxylase and deficiency [1]. An increase in phenylalanine in blood results in severe intellectual disability, epilepsy, and various psychiatric problems through multiple pathogenetic mechanisms. Affected children have visited a dentist less than healthy ones [2]. These patients have more dental plaque, gingival inflammation and dental carries because of their low-protein and phenylalanine-diet and oral health care [3]. Mucocele is one of the common lesions of the oral mucosa. Superficial mucoceles are most commonly found in the soft palate, retromolar pad, and buccal mucosa respectively, and rarely on the lower lip [4]. Clinically, mucocele is often seen in a single form [5,6].

## Case History

A 13-year-old boy was referred to the oral and maxillofacial medicine department complaining of painful ulcers in his lower lip. His parents had noticed the lesions since six months ago. They described the lesions as small swellings and ulcers that never heal. The patient had a habit of holding small toys in his mouth. The patient was diagnosed with Phenylketonuria when he was three years old and had clung to a low-protein and phenylalanine-free diet. He also exhibited degrees of learning disorders and mental retardation. No medicine was used for the lesions at the time of referral to our department. The patient was taking Risperidone and Levothyroxine pills; the latter as a treatment for hypothyroidism. On extraoral examination, no cutaneous lesions were observed. Intraoral examination revealed multiple vesicles and erythema on the interior part of lower labial mucosa, some of which were ruptured and caused ulcers and erosions [Figure 1]. Lesions had a blue hue and measured less than five millimeters. There were no other lesions in his mouth. The patient's overall oral hygiene was good.

Differential diagnosis included mucocele and vesiculobullous diseases. Nikolsky's test was negative. A needle aspiration test was performed on some of the lesions. A translucent, sticky liquid was obtained, suggesting mucous, thus, the salivary origin of the lesions was verified. The mucoceles were treated with micro-marsupialization with local anesthesia as a method that is more appropriate for this case. The patient was scheduled for two weeks follow-up and most of the lesions were healed [Figure2]. Excisional biopsy was performed on the biggest lesion which didn't heal after two weeks. The specimen was submitted to the pathologist for further evaluation. Biopsy revealed fields of spilled mucin that were associated with granulation tissues containing foamy histiocytes [Figure 3]. The result of the biopsy was consistent with mucocele.

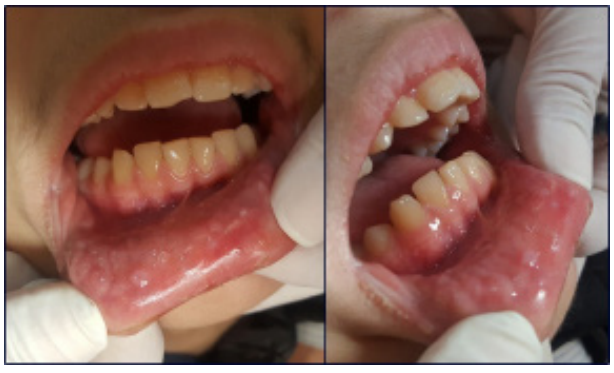

*Figure 1.* Multiple vesicles on the lower lip of the patient.

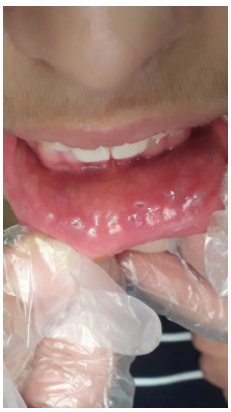

*Figure 2.* Two weeks after micro marsupialization of the lip lesions.

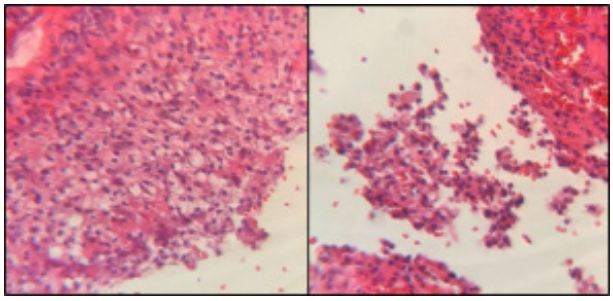

*Figure 3.* Fields of spilled mucin that is associated with granulation tissue containing foamy histiocytes [H&E 10X].

## Discussion

Phenylketonuria is an autosomal recessive metabolic disorder that is caused due to lack of phenylalanine hydroxylase, an enzyme that metabolizes phenylalanine into tyrosine, and if untreated, results in aggregation of phenylalanine, causing gradual encephalopathy and intellectual disabilities. Patients diagnosed with PKU are advised to adhere to a restricted amino acid containing diet and receive special protein supplements [2]. Studies on oral health in people with PKU are few. Some studies attribute phenylketonuric children with a higher prevalence of dental caries in their primary dentition [3,6], while others find no significant difference [7]. Patients with PKU may have some clinical changes in the oral cavity; also, since these patients may harm their oral tissues, they require periodic oral and maxillofacial examinations. This article, maybe the first case report of such lesions in a PKU patient because of inadequate attention to their oral health and its impact on their life quality. Mucocele is a benign lesion of minor salivary gland origin, mainly caused by local traumatic factors. Two types of mucocele formation are mucous extravasation and retention; Extravasation, which is far more common than retention, occurs by spillage of mucous fluid into the adjacent soft tissue as

trauma to the excretory duct of minor salivary glands, whereas retention, is caused by blockage or narrowing of the glandular duct leading to an eventual swelling of the affected duct [8]. Clinical appearance of ruptured mucoceles may resemble ulceration and may be mistaken for conditions such as pemphigus, bullous lichen planus, or recurrent herpes simplex virus infection [4]. Micro-marsupialization is a conservative therapeutic approach for the management of pediatric oral mucoceles [9]. Traumatic lesions such as mucocele can be in the context of mental retardation caused by phenylketonuria. Multiple lesions in our patient can indicate chronic trauma. In patients with PKU, periodic oral examinations must be planned, because treatment alone is not enough, and the lesions can recur with trauma. Therefore, we should always think about the etiology of trauma in these patients, because maybe, like our patient, the parents do not know about it. It's very important to aware of the patents about the lesion and the etiology. This is a point that other articles do less attention to. If we know the high percentage of traumatic lesions in PKU patients, can prevent misdiagnosis and mistreatments. In addition, in normal patients, multiple mucoceles on the lower lip are rare and more investigation is needed.

A few numbers of studies correlate mucoceles with Sjogren syndrome or cystic fibrosis [10]. Also, there has been a relationship suggested between systemic conditions (including hyperadrenocorticism and hypothyroidism) and gallbladder mucoceles (which have the same mechanism of oral mucoceles) in dogs [11]; a curious finding because of our patient's similar hypothyroidism condition. However, this subject requires more research to obtain more definitive results. Few studies have been conducted on the saliva composition of children with PKU to date, which indicates different levels of concentration of saliva contents such as amino acids and enzymes [12]; a topic that requires further research since it could be relevant to mucoceles.

## Conclusion

Phenylketonuria results in mental and cognitive disorders; especially if undetected in the early years of life, therefore, a proper screening and treatment plan for such conditions can be very helpful in preventing subsequent complications. For the treatment of mucocele in uncooperative children micro marsupialization is the best choice. There are a few pieces of research on oral health and oral lesions of PKU patients because of the infrequent nature of this disorder. Hypothyroidism, self-injury, mental retardation, saliva content, low-protein, and phenylalanine-free diet, and many other factors can cause such oral lesions; factors which we are studying. These patients need multidisciplinary cooperation between dentists, physicians, nutritionists, and others to provide maximum health care for them.

## Conflict of Interest

There is no conflict of interest to declare.

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