

# Oral Mucosal Lesions Associated with Use of Quid

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## A b s t r a c t

*Quid is a mixture of substances that is placed in the mouth or actively chewed over an extended period, thus remaining in contact with the mucosa. It usually contains one or both of 2 basic ingredients, tobacco and areca nut. Betel quid or paan is a mixture of areca nut and slaked lime, to which tobacco can be added, all wrapped in a betel leaf. The specific components of this product vary between communities and individuals. The quid habit has a major social and cultural role in communities throughout the Indian subcontinent, Southeast Asia and locations in the western Pacific. Following migration from these countries to North America, predominantly to inner city areas, the habit has remained prevalent among its practitioners. Many dentists are unaware of the prevalence of the quid or paan habit in the Asian patient population. The recognition of the role of such products in the development of oral precancer and cancer is of great importance to the dental practitioner. A variety of oral mucosal lesions and conditions have been reported in association with quid and tobacco use, and the association of these conditions with the development of oral cancer emphasizes the importance of education to limit the use of quid. In most cases, cessation of the habit produces improvement in mucosal lesions as well as in clinical symptoms.*

**MeSH Key Words:** areca/adverse effects; mouth neoplasms/chemically induced; precancerous conditions/chemically induced

© J Can Dent Assoc 2004; 70(4):244–8  
This article has been peer reviewed.

Quid is a substance or mixture of substances (in any manufactured or processed form) that is placed in the mouth, where it is sucked or actively chewed and thus remains in contact with the mucosa over an extended period. It usually contains one or both of 2 basic ingredients, tobacco and areca nut.<sup>1</sup> The composition of betel quid, also known as paan, varies between communities and individuals, although the major constituents are areca nut and slaked lime (from limestone or coral) wrapped within a betel leaf (**Fig. 1**). The paan is placed between the teeth and the buccal mucosa, and is gently chewed or sucked over a period of several hours.<sup>1,2</sup> The slaked lime acts to release an alkaloid from the areca nut, which produces a feeling of euphoria and well-being.<sup>3</sup> Other substances of local preference may be added, such as grated coconut or a variety of spices, for example, aniseed, peppermint, cardamom and cloves.<sup>4</sup> Tobacco may also be used as a component of paan, and this ingredient is associated with a significant risk of oral cancer. In addition, the lime has been shown to release reactive oxygen species from extracts of areca nut, which might contribute to the cytogenetic damage involved in oral cancer.<sup>5</sup> A synergistic

increase in risk of oral cancer has been demonstrated among people who consume alcohol, smoke and chew quid.<sup>6,7</sup>

Variants of paan include use of sliced areca nut alone (**Fig. 2**) and addition of sweeteners to make the product particularly attractive to younger children, to whom it is sold under the names sweet supari, gua, mawa or mistee pan (**Figs. 3** and **4**). Other variants such as kiwam, zarda and mitha pan (also known as gutkha) may contain a variety of substances, including tobacco.<sup>2,8</sup>

Oral mucosal lesions and conditions associated with use of quid and tobacco have been reported.<sup>1,9</sup> In an effort to bring some uniformity to the reporting of quid and tobacco-chewing habits and the associated lesions of the oral mucosa, 22 researchers from 11 countries met for a workshop in Kuala Lumpur, Malaysia, from November 25 to 27, 1996.<sup>1</sup> The definitions of quid and tobacco-chewing habits and associated oral mucosal lesions that were agreed upon during that workshop have been used in this article.

In addition to defining quid-related terminology, the workshop participants set out guidelines for reporting quid use among research subjects. They note that the specific



**Figure 1:** Leaf of betel (Piper betle).



**Figure 2:** Sliced areca nut, one of the major constituents of betel quid (paan), can also be chewed on its own.



**Figure 3:** Sweeteners are added to children's paan.



**Figure 4:** Once the ingredients have been placed on the betel leaf, the leaf is folded and the paan is ready to chew or suck.

ingredients should be listed so as to clearly delineate the following 3 basic categories:

- Quid with areca nut but without any tobacco products, which may involve chewing only the areca nut or areca nut quid wrapped in betel leaf (paan).
- Quid with tobacco products but without areca nut, including chewing tobacco, chewing tobacco plus lime, mishri (burned tobacco applied to the teeth and gums), moist snuff, dry snuff, niswar (a different kind of tobacco snuff) and naas (a stronger form of niswar).
- Quid with both areca nut and tobacco products (paan with tobacco).

A variety of packaged products from all 3 of these categories are now available in several countries. It is almost always possible to identify the presence or absence of the 2 principal ingredients of interest, areca nut and tobacco, and thus to allocate the product to a specific category.<sup>1</sup>

In 1985, the International Agency for Research on Cancer reported that there is sufficient evidence to conclude that the habit of chewing quid that contains

tobacco is carcinogenic to humans, but there is inadequate evidence to conclude that the habit of chewing quid that does not contain tobacco is carcinogenic.<sup>4</sup> Countries with a high prevalence of areca nut use have higher rates of oral cancers than countries where this habit is not established.<sup>10</sup> However, some authorities believe it is the addition of tobacco, rather than the areca nut itself, that leads to these higher rates.<sup>4,11,12</sup>

### Lesions and Conditions Associated with Quid-Chewing Habits

Some oral mucosal lesions and conditions are specifically associated with quid-chewing habits. Two categories of quid-related lesions are recognized:

- Lesions or conditions that are diffusely outlined, that involve more than one site or that represent a widespread alteration, such as those due to mechanical or chemical trauma. Clinical lesions or conditions such as chewer's mucosa fall into this category, but transient states of the mucosa, such as quid stains, are excluded.<sup>1</sup>

- Lesions that are localized to the site where quid is regularly placed. These lesions are equivalent to snuff-induced lesions or tobacco–lime user's lesions, which arise only on the mucosa in contact with the quid.<sup>13</sup>

The following lesions and conditions are defined on the basis of specific criteria for their diagnosis.<sup>1</sup>

### ***Betel Chewer's Mucosa***

Betel chewer's mucosa is a condition of the oral mucosa in which, because of either direct action of the quid or the traumatic effect of chewing (or both), there is a tendency for the oral mucosa to desquamate or peel. Loose and detached white tags of tissue can also be seen and felt. The underlying areas assume a pseudomembranous or wrinkled appearance.<sup>1</sup> The area may also show evidence of incorporation of the quid ingredients in the form of yellowish or reddish brown encrustations.<sup>14</sup> This type of lesion should be distinguished from cheek-biting, which leads to a very similar appearance in terms of clinical and histologic features. For example, cheek-biting is unintentional, whereas chewer's mucosa results from an intentional habit. In addition, the average age of people with chewer's mucosa is usually higher, at least 50 years,<sup>15</sup> whereas cheek-biting typically occurs in younger people, around 20–35 years.<sup>4,15</sup>

### ***Quid-Induced Lesion***

A quid-induced lesion is a localized lesion of the oral mucosa corresponding to the regular site of placement of quid. It is characterized by one or more of the following characteristics: change in colour, wrinkled appearance, thickening of the mucosa, scrapable or non-scrapable epithelial surface, and presence of ulceration.<sup>1</sup>

### ***Areca-Nut-Related Lesion***

Areca nut chewers, like chewers of other kinds of quid, may have clinically healthy mucosa with no textural or colour changes. However, the buccal mucosa, either bilaterally or unilaterally, may show an ill-defined whitish grey discoloration that cannot be rubbed off. In addition, the mucosa may show a rough, linen-like texture, and histologic examination reveals ortho-keratinized or para-keratinized epithelium. Rarely, localized white or red lesions and malignancies may be seen among areca nut chewers; these should be distinguished from lesions arising from other habits.<sup>1</sup>

### ***Oral Submucous Fibrosis***

Oral submucous fibrosis (OSF) was initially described in 1966 by Pindborg and Sirsat<sup>16</sup> as an insidious, precancerous, chronic disease that may affect the entire oral cavity and that sometimes extends to the pharynx.<sup>17,18</sup> Although it is occasionally preceded by the formation of vesicles,

OSF is always associated with a subepithelial inflammatory reaction followed by fibroelastic changes of the lamina propria, accompanied by epithelial atrophy. This process leads to stiffness of the oral mucosa, which results in trismus and inability to eat.<sup>18</sup> Various factors have been implicated in the development of OSF, the most common of which is chewing areca nut.<sup>19,20</sup> Associations with tobacco use and vitamin deficiency have also been reported.<sup>21</sup>

OSF is predominantly seen in people in south Asian countries<sup>22</sup> such as Bangladesh, Bhutan, India, Pakistan and Sri Lanka, or in south Asian immigrants to other parts of the world.<sup>23,24</sup> It is extremely rare in white populations,<sup>11</sup> although cases have occasionally been reported in Europeans; it also occurs in people from Taiwan, China, Nepal, Thailand and Vietnam.<sup>19</sup> The condition affects predominantly women (female–male ratio of 3:1)<sup>8,18</sup> and characteristically presents in adulthood (between the ages of 45 and 54 years).<sup>8</sup>

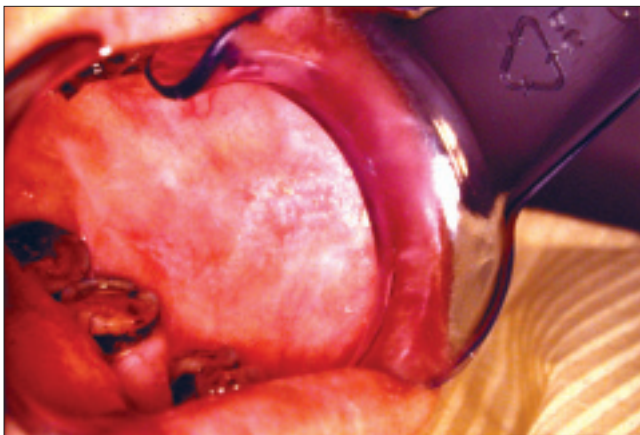
OSF is diagnosed on the basis of clinical criteria, including oral ulceration, paleness of the oral mucosa, a burning sensation (particularly in the presence of spicy foods), hardening of the tissue and presence of characteristic fibrous bands. The condition is associated with gradual onset of inability to open the mouth<sup>8</sup> and protrusion of the tongue, which causes difficulty in eating, swallowing and phonation. It has been recognized that OSF may manifest itself at an early stage without the presence of fibrous bands,<sup>8,25</sup> and although palpable fibrous bands are not always present, a tough leathery mucosa with all the associated symptomatic, clinical and histopathologic characteristics of OSF may be seen.<sup>25</sup> It is therefore recommended that the definition of OSF be extended and that this condition be diagnosed on the basis of the presence of one or more of the following characteristics:<sup>1</sup>

- palpable fibrous bands
- tough, leathery texture of the mucosa
- blanching of the mucosa (defined as a persistent, white, marble-like appearance of the oral mucosa, which may be localized, diffuse or reticular), accompanied by histopathologic features characteristic of OSF (atrophic epithelium with loss of rete ridges and juxta-epithelial hyalinization of the lamina propria and the underlying muscle).

### ***Betel Quid Lichenoid Lesion***

A quid-induced lichenoid oral lesion has been reported exclusively among users of betel quid.<sup>26</sup> It resembles oral lichen planus, but there are certain specific differences. The quid-induced lesion is characterized by the presence of fine, white, wavy, parallel lines that do not overlap or criss-cross, are not elevated and in some instances radiate from a central erythematous area. The lesion generally





**Figure 5:** White papular and striated lichenoid lesion induced by betel quid. Photo courtesy of Dr. Karen Burgess.

occurs at the site of placement of the quid. This lesion was originally described as a lichen-planus-like lesion, but it is now termed a betel-quid lichenoid lesion (Fig. 5).<sup>1</sup> This lesion may regress with decrease in the frequency or duration of quid use or a change in the site of placement of the quid. There may be complete regression if the quid habit is given up.<sup>1</sup>

## Conclusions

The association of the conditions described above with the development of oral cancer highlights the importance of education on limiting the use of quid. In particular, there seems to be an association between the use of quid that incorporates tobacco and the occurrence of white lesions.<sup>14,27</sup> The intraoral locations of white lesions are generally influenced by the person's specific tobacco habits, and there seems to be a significant relationship between tobacco cessation and a decrease in the incidence rate of white lesions.<sup>14</sup>

No specific test is available to confirm whether a particular oral lesion was caused by the patient's quid habit. The diagnosis must be made on the basis of a history of repeated exposure to betel quid containing certain ingredients, the clinical appearance and the texture of the tissue (especially for OSF). Incisional biopsy is recommended, specifically biopsy of the most severely affected area (or any area of ulceration) to rule out squamous cell carcinoma.<sup>28</sup> Histopathologic examination may show a dense, chronic inflammatory infiltrate with epithelial changes ranging from atrophy accompanied by hyperkeratosis to dysplasia to frank malignancy.

The management of such oral lesions depends on the type of quid-related lesion. The first option is no treatment, accompanied by discontinuation of the betel quid habit and appropriate follow-up. Mild cases of OSF or patients with limited jaw opening that still permits reasonable eating abilities and access for oral hygiene and dental care may be treated without intervention but with a focus on

quitting the quid habit. Severe cases can be successfully treated, with return to near-normal jaw opening, by complete excision and surgery using mucosal or nonvascularized split-thickness skin grafts of the affected areas.<sup>28</sup> Successful prevention in the early stages of these conditions may lead to improvement in symptoms.<sup>8</sup> However, when the patient continues his or her betel quid habit, the prognosis for an untreated lesion, regardless of its colour, degree of thickening, ulceration of the epithelial surface or presence of thick fibrous bands, is progressive worsening, with a high risk for squamous cell carcinoma.<sup>28</sup>

The quid habit has a major social and cultural role in communities throughout the Indian subcontinent, Southeast Asia and locations in the western Pacific. Following migration from these countries to North America, predominantly to inner city areas, the habit has remained prevalent among its practitioners. Dental practitioners in North America should be aware of these conditions and their relation to betel quid use, since they may well be seen more frequently in the future. An active preventive approach is required to limit the potential for the development of oral cancer. ♦



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*The author has no declared financial interests.*

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