

White Sponge Nevus: Report of Case And Literature Review

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Case Report

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Abstract: White sponge nevus (WSN) is a rare benign autosomal dominant disorder. To date, a few hundred cases have been reported worldwide. It is usually manifested as white, soft, and spongy plaque involving the mucous membrane, predominantly the oral mucosa. Careful clinical and histopathological examination is recommended to exclude other more serious disorder presenting as oral white lesions. Herein, we present the second Tunisian case of oral WSN in an 18-year-old female with no familial background. Current approaches in literature to the diagnosis and treatment were also studied.

Keywords: Oral mucosa, Hereditary Mucosal Leukokeratosis, White lesion, white sponge nevus.

INTRODUCTION

White sponge nevus (WSN) is a rare, benign condition affecting the mucous membranes. It was first described by Hyde in 1909 but the term WSN was introduced by Canon in 1935 [1, 2]. It is an autosomal dominant mucosal disorder that affects non keratinizing stratified epithelia, primarily the oral mucosa.

We report a rare, sporadic case of oral WSN in a young female patient. The purpose of this paper is to highlight the clinical and histological features of WSN and to provide an overview in terms of the current options of its management.

CASE REPORT

An 18-Year-old, female patient was referred to our department for diffuse white lesions of the oral mucosa suspicious of a lichen planus.

The lesions were present since early childhood and were completely asymptomatic. However, the patient reported a discomfort for spicy foods.

Intra-oral examination revealed extensive white, spongy plaques with thick folded surfaces that involve buccal and lip mucosa, ventral and lateral borders of the tongue, retro molar areas and floor of the mouth (figure 1, 2, 3).

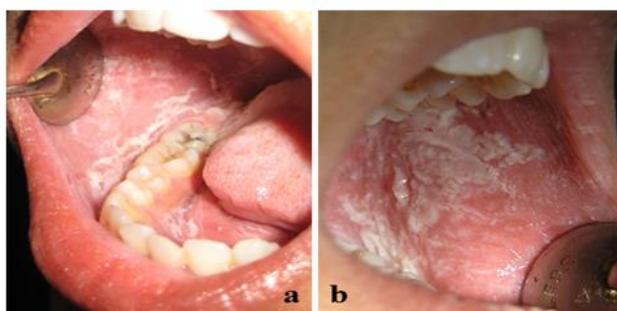


Fig-1 : white spongy extensive plaques on the right (a) and left (b) buccal mucosa



Fig-2 : white spongy plaques on ventral (c) and lateral borders (d) of the tongue

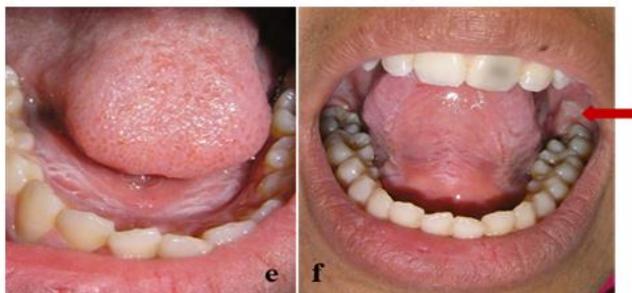


Fig-3: White spongy plaques involving floor (e) and retro molar areas (f) of the mouth.

These plaques were peeled away from underlying normal mucosa. Other mucosa and skin were not affected. Also, no ocular or associated nail lesions were observed. Examination did not reveal smoking habit or any medical allergy or systemic disease that can relate to these lesions. There is no history of similar lesions in any immediate family member.

An incisional biopsy of the oral mucosa for histopathological examination revealed a hyperplastic epithelium due to acanthosis and hyperparakeratosis with a desquamative surface. Spongiosis, focal acantholysis, vacuolization of the keratinocytes and a perinuclear eosinophilic condensation were also noted (figure 4). PAS staining revealed mycelial filaments at the surface of the epithelium indicating mycotic infection. FDI study was negative.

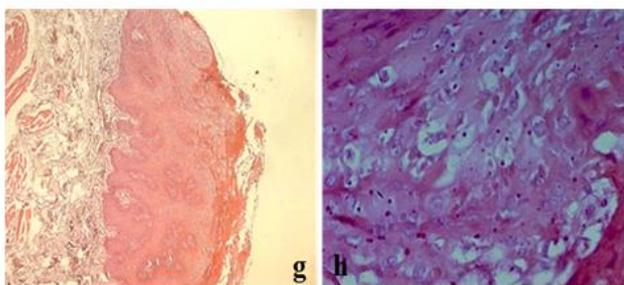


Fig-4 : Thickened epithelium due to acanthosis and hyperparakeratosis with a desquamative surface. Spongiosis, focal acantholysis, vacuolization of the keratinocytes and a perinuclear eosinophilic condensation (g: HE 40; h: HE 400)

Based on clinical and histological data, the diagnosis of WSN was established. Since the patient had no complaints, therapeutic abstention was indicated. However, an antifungal treatment was prescribed due to histological findings.

DISCUSSION

WSN is an uncommon genodermatosis. Its prevalence rates at less than 1 in 200000, with no gender or racial predilections [3]. Since, it is an autosomal dominant disorder with incomplete

penetrance, several sporadic cases with no familial history, like ours, was reported [1].

This condition is mostly attributed to mutations of keratin 4 and/or13, which are specific to the spinous layer of non-keratinizing stratified epithelium [4, 5]. According to Liu X *et al.* [6], all patients with family history exhibit a keratin 4 or 13 mutation. However, the sporadic patients with no familial background were heterogeneous: the majority of them (4/5) did not exhibit any mutational evidence,

and thus their clinical and histological features might be attributed to different causes. Indeed, HPV 16 DNA sequences were detected in biopsy of oral WSN by Cox MF *et al* [7]. Another report concluded that the thickening of superficial layer is due to dysfunction of Odland bodies [8].

Recently, Wenping *et al.* [9] have investigated the pathological mechanism behind the WSN expression profile by RNA sequencing. Results showed that, in the WSN patients, the ribosome structure was damaged; the translation rate was limited, while ubiquitin-mediated proteolysis was enhanced. Thus, they suggested that the abnormal degradation of keratin 13 protein in WSN patients may be associated with keratin 7 and an abnormal ubiquitination process.

Clinically, lesions appear in childhood or adolescence [10]. In our case, lesions were spotted at 12 years old age. However, they might be present at an earlier age. Oral mucosa is the most affected but nasal, laryngeal, oesophageal, vaginal and anal involvements had also been reported [1, 11].

The majority of authors describe WSN as extensive, white, soft, spongy plaques. The plaque's surface is thickened, folded and may peel away from underlying normal mucosa, similar to our case. The lesions may involve the entire non keratinized oral mucosa, the affected areas and their distribution can change with time [1]. The buccal mucosa is the most affected site followed by lips, tongue and the floor of the mouth [11].

Oral involvements are bilateral; nevertheless, they can be present as unilateral, discreet, white patch.

Therefore, it is possible that WSN is under diagnosed [12]. WSN is asymptomatic but patient tend to complain of an altered texture and/or an unaesthetic appearance of the oral mucosa.

Since the WSN is presented as white patches of the oral mucosa, it should be differentiated from other white lesions of type inflammatory, infectious, traumatic, congenital or even premalignant and malignant [11, 13]. At an early age, WSN is often misdiagnosed as oral candidiasis (thrush). This diagnosis is often excluded with negative fungal examination or unresponsiveness to antifungal treatment [3, 13].

In contrast to WSN, Oral lichen planus is quite uncommon in young people. WSN's plaques can be removed away by scraping and never present symptomatic inflammatory relapses [1, 13]. Leukoedema, chronic cheek-biting, tabaccoo-induced keratosis should be excluded. WSN can also mimic focal epithelial hyperplasia (Heck's disease).

It must be especially differentiated from oral leukoplakia, proliferative verrucous leukoplakia, and even squamous cell carcinoma. Distinction among these diseases is essential due to the differences in treatment and prognosis [3, 13].

Congenital disorders may also be confused with WSN. These genodermatosis include pachynychia congenita, hereditary benign intraepithelial dyskeratosis, Darier's disease and dyskeratosis congenital [1, 13]. However, other associated clinical manifestations of these disorders can help to differentiate them from WSN (table 1).

Table-1: Clinical features of some genodermatosis to differentiate from WSN [1]

Pachyonychia congenita(Jadassohn-Lewandowskisynndrome)	follicular hyperkeratosis and leukokeratosis of oral mucosaTubular and contracted nails, palmoplantar kerotoderma, hyperhidrosis
Hereditary benignintraepithelial Dyskeratosis	Bilateral limbalconjunctival plaques combined with similar changes in the oral mucosa
Darier'sdisease	Itchy reddish-brown keratotic papules primarily in a seborrheic distribution but other types are reported including white papules with cobble stone appearance on the gingival, plate, and buccal mucosa
Dyskeratosis congenita	Reticulated pigmentation of the skin, nail dystrophy, leukoplakia and bone marrow failure

A biopsy is often indicated to distinguish WNS from the above-mentioned disorders. Histopathological examination typically reveals: thickened epithelium marked with acanthosis and parakeratosis, characteristic perinuclear eosinophilic condensation that correspond to abnormal aggregation of cytokeratin tonofilaments [1, 11], spongiosis and vacuolization of the spinous layer keratinocytes. Consequently, the differential histological diagnosis needs to exclude HPV-derived lesions and clear cell tumours of oral mucosa [12].

The perinuclear eosinophilic condensation is a feature that has been claimed to be characteristic to WSN, although not pathognomonic [31]. WSN is usually asymptomatic and runs a benign course. Thus no treatment is often required [3]. However, when patients express a discomfort (texture, appearance...), treatment may be proposed. Topical treatments are always preferable to systemic ones. Numerous therapy were tried with variant degrees of success, we quote: antihistamines [3], antifungal, retinoid, systemic or

local antibiotic [10], liquid nitrogen, laser Nd YAG [14], laser CO2 [15] and local antiseptic [16].

The use of systemic antibiotics like azithromycin [14], penicillin [17] or doxycycline [18] was beneficial according to several trails. In some cases a total resolution was obtained, but in other cases a partial improvement or even no response was noticed. Tetracycline in local application has also been tried [19]. It is possible that its beneficial effect is related to modulation of epithelial keratinisation [10].

Regardless of the route (local or systemic), authors insist on the importance of maintaining a regular administration of antibiotics in order to prevent recurrence. Long term prescription of antibiotics should be considered, only, in case of great discomfort or extensive lesions.

Also chlorhexidine 0, 12% was found efficient in the treatment of WSN. This effect can be explained by its antimicrobial action on some oral microorganism hypothetically involved in the expression of WSN in genetically predisposed patients [16]. Indeed, some authors have hypothesized that bacterial, viral, and even fungal infections may contribute to the expression of WSN lesions [6, 13]. Besides, Dufasne *et al.* [1] described a case of effective surgical resection with no recurrence for 2 years. According to Murat Songu *et al.* [3] none of the treatment protocols are likely to be effective unless they take into account the genetic nature of the lesions.

Patient should be informed that these treatments are just suspensive and have no effect on the genetic origins of WSN. They should be advised to avoid exposition to any irritative factors and perform a careful oral hygiene to reduce infection in oral cavity [5].

CONCLUSION

Although WSN is a benign disorder, the correct diagnosis should be established as it can mimic several more serious conditions, some of which with malignant potential. Diagnosis is based on disease history, clinical features and histopathological examination. There is no standard or effective treatment protocol for WSN to date. The mechanism underlying WSN remains also unclear. Further studies, among other genetics, should be carried. Prenatal genetic diagnosis and gene therapy seems to be the only way to reverse the phenotype in affected families. They may become available in the near future and could provide instruction for treating other keratin-associated diseases.

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