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## Introduction

The cutaneous horn (*cornu cutaneum*) is a circumscribed, conical and keratotic lesion, which can hide benign or malignant lesions [1-3]. The clinical diagnosis is established based on its appearance, the lesion being classified as solitary or multiple, straight, curved or twisted, white or yellow [4,5], most often located at the level of the skin on the patient's face [4,6,7]. While the cause leading to the formation of cutaneous horns [8] is unknown, UV radiations are believed to be the trigger of this condition [9]. Usually, the cutaneous horn occurs in people over the age of 50, in both genders [10-14].

The cutaneous horn can occur in any part of the body: the malar or frontal areas, *dorsum* of nose, neck, lips [3], upper eyelids [2,9,12], lower eyelid [15], external ear [3,16], scalp [3,4], upper limbs [3,11,17,18], chest [9], lower limbs [1] and penis [19].

The treatment of choice is the surgical excision of the lesion

## Case Report

# Cutaneous Horn of the Eyelid: Anatomoclinical Implications

## Abstract

Cutaneous horns are relatively rare benign tumors which occur most frequently on sun exposed skin and develop on various types of underlying skin lesions: benign, premalignant and malignant. The treatment of choice consists in the surgical excision of the lesion to healthy tissue. The histopathological examination is mandatory in order to establish the nature of the lesion, on which the cutaneous horn develops. We are presenting two clinical cases of cutaneous horns of the eyelid diagnosed in a 19 and a 78 year old patient, respectively, which developed on an association of preexisting lesions: chalazion or inclusion cyst, along with moderate dysplasia of the epidermis in both cases.

to the healthy tissue [17,20,21], followed by a histopathological examination in order to confirm the diagnosis [6, 13, 18, 22, 23], the real point of interest being not the cutaneous horn, but the underlying lesion [1].

The cutaneous horn can develop on benign (seborrheic keratosis, viral warts, histiocytoma, inverted follicular keratosis, verrucous epidermal nevus, molluscum contagiosum, etc), premalignant (solar keratosis, arsenical keratosis, Bowen's disease) or malignant lesions (squamocellular carcinoma, rarely, basal cell carcinoma, renal metastatic carcinoma, granular cell tumor, sebaceous carcinoma or Kaposi's sarcoma) [2,3,14].

We are presenting two clinical cases of cutaneous horns of the eyelid diagnosed in a 19 and a 78 year old patients, respectively, which developed on an association of preexisting lesions: chalazion and inclusion cyst, along with moderate dysplasia of the epidermis in both cases.

## Case 1

A 19-year-old male patient, resident in a the rural area, was admitted to the Ophthalmology Clinic for a solitary firm horn on the lower eyelid, which had gradually progressed over the course of two months. One year before, the patient noticed a focal swelling of the inferior eyelid treated empirically, on which the cone shape growth developed progressively. The patient's medical and ocular history was not significant.

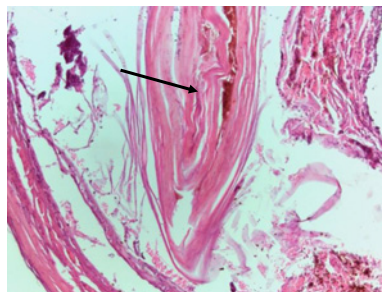
The clinical examination revealed a solitary cone shape hyperkeratotic growth measuring 1.0/0.6 cm in size, with an inflamed nodular base, located in the middle 1/3<sup>rd</sup> of the inferior

right eyelid (Figure 1). There was no regional lymphadenopathy. The clinical diagnosis was that of solitary inferior right eyelid cutaneous horn. The lesion was excised completely with local anesthesia, and the defect was closed by sliding the skin of the inferior eyelid and sutured with Vicryl (gauge 6.0).

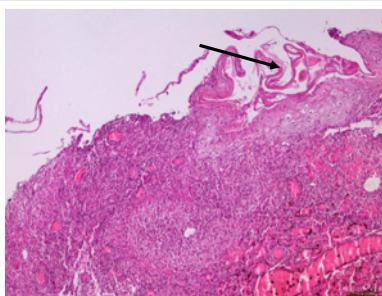
The resection specimen was evaluated histologically, revealing an association of three vertically overlapped lesions: compact acellular keratin, with a "dome" shape (Figure 2), overlying an hyperplastic epithelium showing an infection with human papilloma virus (Figure 3A) and a moderate dysplasia of the adjacent epidermis (Figure 4). Underneath the hyperkeratosis and the hyperplastic epidermis, a chalazion could be identified into the deep dermal structure (Figure 3B). The postoperative evolution was favorable: no scar formation and no clinical relapse for six months.



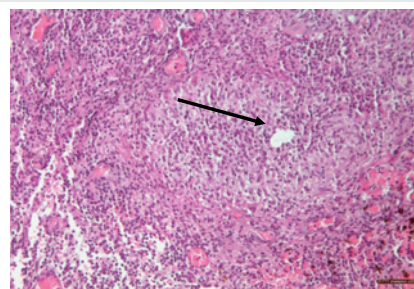
**Figure 1:** Right lower eyelid cutaneous horn (19-year-old patient).



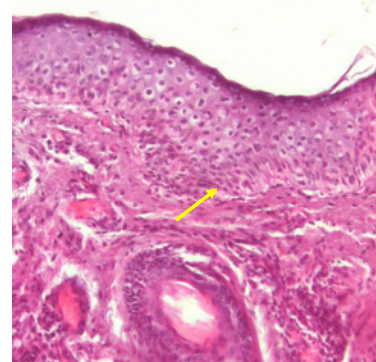
**Figure 2:** Microscopic examination: acellular keratin layers, displayed in a "dome" fashion (black arrow) (hematoxylin-eosin staining, x10 original magnification).



**Figure 3a:** Microscopic image: the lesion consists of connective and vascular neoformation tissue that was abundantly infiltrated by lymphoplasmacytes. In some places there were epithelioid granulomas developed around an optically empty lipid vacuole surrounded by numerous polymorphonuclear cells. On the surface, the lesion is covered by a keratinised multi-layered malpighian epithelium, with koilocytes and hyperkeratosis, remnant of the cutaneous horn (black arrow) (hematoxylin-eosin staining, x100 original magnification).



**Figure 3b:** At higher magnification, the epithelioid granuloma is centered by the optically empty lipid vacuole (black arrow) surrounded by polymorphonuclear cells. Periferically, the granuloma was surrounded by fibrosis and neoformative connective and vascular tissue (hematoxylin-eosin staining, x 200 original magnification).



**Figure 4:** The multi-layered malpighian epithelium located in the marginal area of the cornu cutaneum base revealed moderate dysplasia (yellow arrow) (hematoxylin-eosin staining, x 200 original magnification).

## Case 2

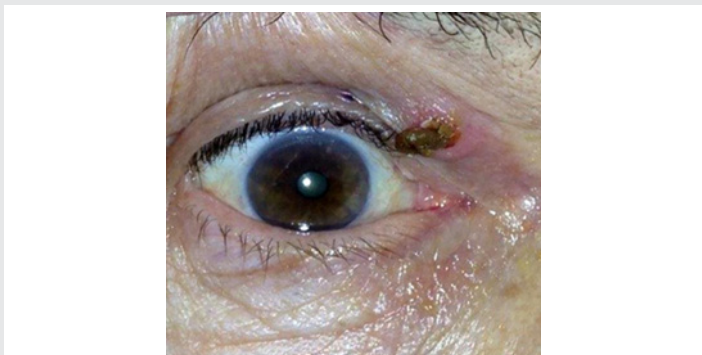
A 78-year-old male patient, resident in a rural area, was hospitalized for a cone shape growth on the upper right eyelid which had gradually progressed for six months. The patient's medical ocular and general history was not significant. An ophthalmological clinical examinations demonstrated a cone shape hyperkeratotic growth developed on a well-defined inflamed nodular lesion, with ulcerated horn implantation edges, measuring 0.6/0.3 cm in size, in the internal 1/3<sup>rd</sup> of the upper right eyelid (Figure 5). Moreover, multiple pigmented lesions were noticed on the patient's face. The biomicroscopic examination diagnosed a incipient cataract in both eyes. There was no regional lymphadenopathy. The clinical diagnosis was that of a cutaneous horn located on a cystic sebaceous lesion on the right upper eyelid. The tumor growth was excised completely through ellipsoidal incision and primary closure of the defect with Vicryl suture (gauge 6.0) was done.

The resection specimen was evaluated histopathologically, revealing an association of three lesions: cutaneous horn (which "detached" from the basis of the underlying lesion, just before the surgical intervention), moderate dysplasia of the underlying epidermis and epidermal inclusion cyst located in the deep dermal structure (Figure 6A-D). The postoperative evolution was favorable: no scar formation and no clinical relapse for a year.

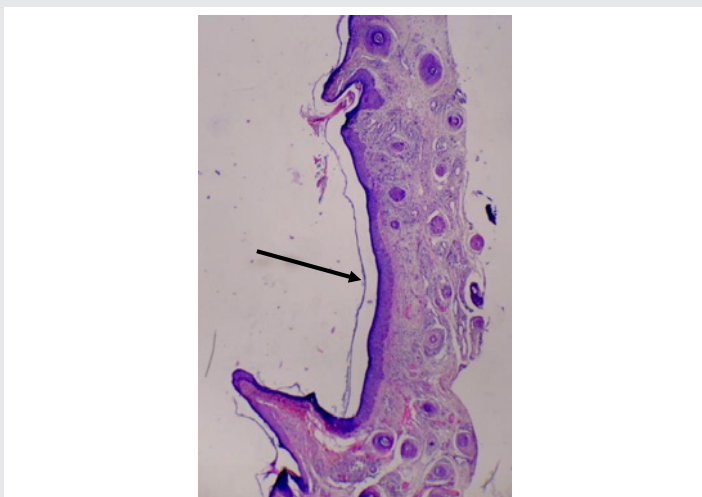


## Discussion

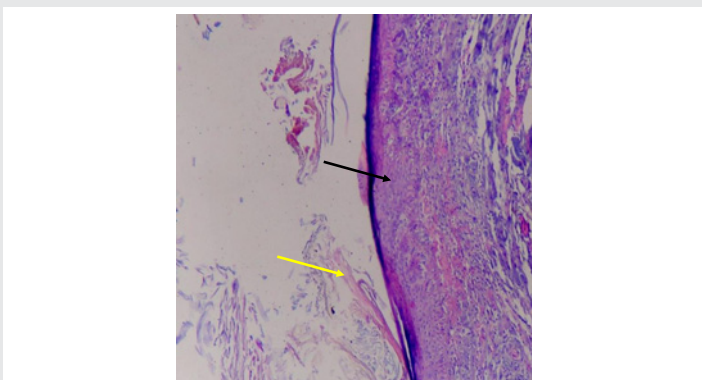
The cutaneous horn is a clinical diagnosis which refers to a tumor located on the surface of the skin [14,24] with a hyperkeratotic cone shape [3], white-yellowish in colour,



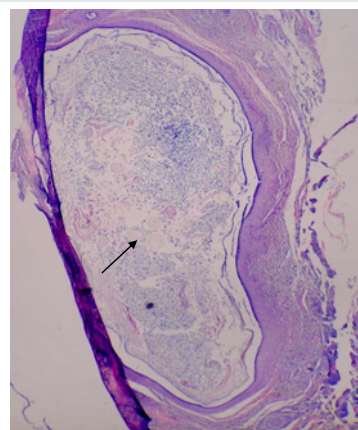
**Figure 5:** Right upper eyelid cutaneous horn (78-year-old patient)



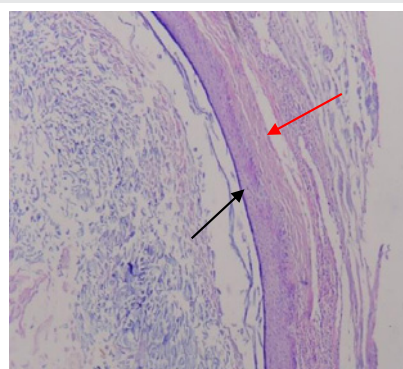
**Figure 6a:** The palpebral cutaneous fragment presenting two epidermal projections located at a distance, between which a depression is delimited (black arrow). In that area, the epidermis showed hyperkeratinization, remnant of the cutaneous horn which detached very easy just before the surgical intervention (hematoxylin-eosin staining, x100 original magnification).



**Figure 6b:** Higher magnification of the same image: the cutaneous depression was delimited by epidermis revealing moderate epithelial dysplasia (black arrow), and, rarely, koilocytes in its superficial layers. Above it, multilayered keratin could be seen, that were the remnants of the cutaneous horn (yellow arrow). Below the dysplastic epithelium, in the superficial dermis, a lymphoplasmacytic inflammatory infiltrate was noticed. (hematoxylin-eosin staining, x 200 original magnification).



**Figure 6c:** In the deep dermal structure, a cystic lesion (black arrow) lined by keratinized squamous epithelium could be noticed and represented the epidermal inclusion cyst. Its lumen contained keratin lamellae (hematoxylin-eosin staining, x100 original magnification).



**Figure 6d:** At a higher magnification, the wall of the intradermal inclusion cyst was made of keratinized squamous epithelium (black arrow) displayed on a thin layer of fibrous connective tissue (red arrow). The keratin lamellae filled the lumen of the cyst (hematoxylin-eosin staining, x 200 original magnification).

ranging from a few millimeters to a few centimeters in size, which can hide other benign or malignant underlying lesions [1].

This tumor is common in Caucasians, less frequent in Asian and Arabic populations, and rare in the African population [25].

The age of onset of the cutaneous horn is between 60–70 years old, and the underlying malignant lesions identified are common in people over the age of 70 [14].

The first case of cutaneous horn was reported in London, in 1588, in an elderly Welsh woman [8,9].

The cutaneous horn is made of compact keratin. The basis can be flat, nodular or „crater-like”. Clinical aspects can not give any clue to differentiate a benign or a malignant lesion, but the indurated and bleeding base of a large tumor pleads in favour of malignancy [14]. The cutaneous horn develops most often on sun exposed skin, on a preexisting lesion, such as benign warts or seborrheic keratosis. However, the real pathobiology of the developing of a cutaneous horn on the surface of these lesions remains unknown [14].

From a histological perspective, the cutaneous horn is made of compact hyperkeratosis, which can be either orthokeratotic

(an anuclear keratin layer, as in the normal epidermis [26]) or parakeratotic (retention of nuclei in the cells of the stratum corneum of the epidermis [27]).

Moreover, it is often associated with acanthosis; the base of the cutaneous horn will highlight a pathological process which is responsible for its formation [1,11,14].

The most common types of lesions that can be identified histopathologically at the base of the cutaneous horn include: actinic keratosis, keratoacanthoma, seborrheic keratosis, pyogenic granuloma, discoid lupus erythematosus, verruca vulgaris, epidermal nevus, trichilemmal cyst, trichilemmoma, prurigo nodules, intradermal nevi, Bowen's disease, basal cell carcinoma and squamous cell carcinoma [14,18,28-30].

The clinico-pathological study of 48 cases with cutaneous horns of the eyelid conducted by Mencía-Gutiérrez et al. (2004) shows that 77.1 % of them were associated with benign lesions, 14.6% with premalignant lesions, and 8.3 % with malignant lesions. They also searched for the association between cutaneous horn with a certain lesion regarding the malignancy. So, they found the following correlation: seborrheic keratosis as a benign lesion, actinic keratosis as the premalignant lesion, and basal cell carcinoma and squamous cell carcinoma as malignant lesions were associated more commonly with the cutaneous horn [20].

The 19-year-old patient stated that the first lesion he noticed was the chalazion, which was treated empirically and on the surface of which, the cutaneous horn developed later, over a period of two months, in Case 1. The lesion on which the cutaneous horn developed was a benign one, but the epidermis adjacent to it, showed a moderate dysplasia, so it required a larger excision of the base of the cutaneous horn to the healthy tissue.

In the second clinical case, the patient also came from the rural area, being exposed to solar radiations, and the lesion on which the cutaneous horn developed was a benign one (epidermal inclusion cyst), but again the epidermis adjacent to it showed a moderate dysplasia, and required a larger excision of the base of the cutaneous horn to the healthy tissue.

In these two clinical cases of cutaneous horns that we have presented here, associations of benign lesions were noticed, as well as the presence of a premalignant lesion, which highlight the fact that the histopathological examination is essential for identifying the nature of the lesion at the base of the cutaneous horn. The clinical appearance of the lesion can mask the premalignant or malignant potential of the underlying lesions and, for this purpose, the excision to the healthy tissue is essential, in order to prevent relapse.

In the case of the patients with benign lesions, subsequent monitoring is unnecessary.

However, if an association of the cutaneous horn with a malignant lesion is found, the patient must be assessed in order to diagnose potential relapse. In the case of patients with squamous cell or basal cell carcinomas at the base of the

cutaneous horn, a screening must be performed to prevent relapses every 3-12 months for first 2 years, every 6-12 months for 3 years, and then at least annually for life [31].

## Conclusions

The cutaneous horn is a lesion which, from a clinical perspective, cannot give the physician any indication as to its nature, i.e. benign or malignant; it can mask several benign, premalignant, as well as malignant lesions, and can only be diagnosed through a histopathological examination, which is essential in later therapeutic conduct.

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