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Keratoacanthoma Presenting as a Cutaneous Horn of the Helix in an Elderly Man: A Case Report

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Abstract

A cutaneous horn is a clinical description of a conical projection of compacted keratin, and the lesion at its base may be benign, premalignant, or malignant. Keratoacanthoma is a keratinizing squamous lesion that may closely resemble squamous cell carcinoma, particularly on sun-exposed sites such as the auricle. We report the case of a 69-year-old man who was a non-smoker with a history of sun exposure and no relevant medical history and who presented with a slowly growing, asymptomatic mass of the left helix over several months. Examination revealed an exophytic lesion arising from the lateral border of the left helix with a long, curved, horn-like keratin projection, and no cervical lymphadenopathy. The differential diagnosis included squamous cell carcinoma, hypertrophic actinic keratosis, basal cell carcinoma, verruca vulgaris, and chondrodermatitis nodularis helicis. Wedge excision, including the underlying cartilage, with primary closure, was performed under general anesthesia. Histopathological examination showed a symmetric, cup-shaped squamous proliferation with a central keratin-filled crater, prominent epidermal lips, and minimal atypia, without perineural or lymphovascular invasion; a dermatopathologist confirmed a completely excised keratoacanthoma. Recovery was uneventful, with no evidence of recurrence at six-week follow-up. A cutaneous horn of the ear should be completely excised, including its base, because the underlying lesion cannot be determined clinically.

Categories: Otolaryngology
Keywords: auricular lesion, cutaneous horn, helix, keratoacanthoma, squamous cell carcinoma, wedge excision

Introduction

A cutaneous horn is a clinical term for a conical, circumscribed projection of compacted keratin arising from the skin surface. It is a morphological description rather than a diagnosis, because the lesion at its base may be benign, premalignant, or malignant. In the largest histopathological series of 643 cutaneous horns, 38.9% arose from premalignant or malignant lesions, and the pinna was among the sites most often associated with such underlying pathology [1]. A later series of 222 cutaneous horns reported premalignant or malignant lesions at the base in more than half of the cases [2].

Keratoacanthoma is a keratinizing epithelial lesion traditionally described as a rapidly growing, dome-shaped nodule with a central keratin-filled crater. It most commonly arises in sun-exposed areas, particularly in elderly individuals with chronic ultraviolet exposure. Although keratoacanthoma has historically been regarded as a benign lesion with potential for spontaneous regression, its biological behavior remains controversial [3]. The concept of a spectrum between keratoacanthoma and well-differentiated squamous cell carcinoma has been proposed, with some authors regarding keratoacanthoma as a variant of squamous cell carcinoma and others as a distinct benign neoplasm that may nevertheless be associated with squamous cell carcinoma [4,5].

Lesions involving the auricle present an additional diagnostic and therapeutic challenge. The helical rim is a high-risk anatomical site because of cumulative sun exposure, thin skin, and proximity to the underlying cartilage, and squamous cell carcinoma of the ear has higher rates of local recurrence and metastasis than squamous cell carcinoma at many other cutaneous sites [6]. As a result, clinicians often adopt a lower threshold for surgical excision of auricular lesions, even when a benign diagnosis is considered.

Cutaneous horns of the ear are commonly encountered in clinical practice, but the lesion at their base cannot be identified clinically, and keratoacanthoma in this setting may closely mimic squamous cell carcinoma. Documenting such cases is important because they demonstrate why a cutaneous horn at a high-risk site should be completely excised, including its base, rather than simply shaved off, and how the histological distinction between keratoacanthoma and squamous cell carcinoma depends on assessing the entire lesion. Reporting this presentation may therefore help clinicians select the appropriate surgical approach for auricular cutaneous horns.

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Case Presentation

A 69-year-old man presented with a slowly growing mass on the left ear, which he had noticed over the preceding few months. The mass was not associated with pain, bleeding, discharge, or any other symptoms. He had a history of sun exposure, was a non-smoker, and had no relevant past medical history. On examination, an exophytic lesion arose from the lateral border of the left helix, with a long, curved, yellowish-brown, horn-like keratin projection (Figure *1A*). There was no cervical lymphadenopathy. The clinical impression was a cutaneous horn, with keratoacanthoma suspected as the underlying lesion, and the differential diagnosis included squamous cell carcinoma, hypertrophic actinic keratosis, basal cell carcinoma, verruca vulgaris, and chondrodermatitis nodularis helicis. Surgical excision was planned for both diagnosis and treatment.

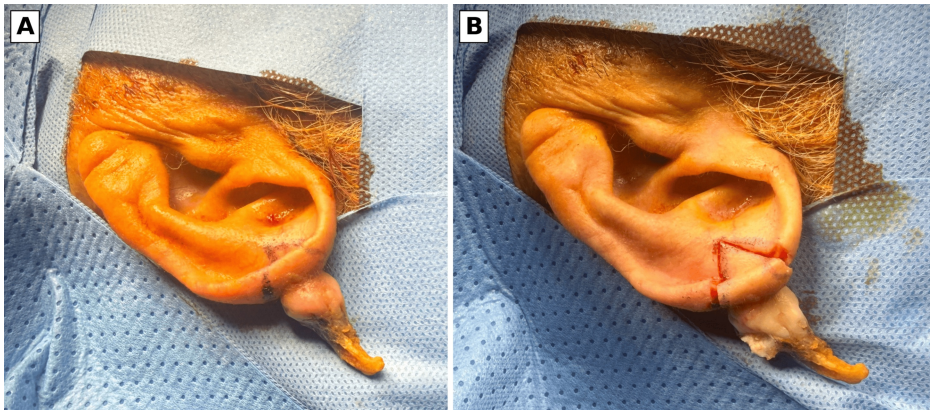


FIGURE 1: Lesion of the left helix and surgical incision

(A) Exophytic lesion arising from the lateral border of the left helix, with a long, curved, horn-like keratin projection. (B) Wedge excision marked and incised around the lesion base.

Approximately one month after presentation, excision was performed under general anesthesia with endotracheal intubation while the patient was in the supine position. After the surgical site was cleaned and draped, local anesthetic infiltration was performed, and a wedge excision around the base of the lesion was marked and incised (Figure *1B*). The mass was excised together with the underlying cartilage. The skin edges were undermined, and excess cartilage was trimmed to allow tension-free closure. The resulting full-thickness wedge defect (Figure *2A*) was closed primarily with 5-0 Prolene® polypropylene sutures (Ethicon, Inc., Somerville, NJ, USA), and hemostasis was secured (Figure *2B*). The procedure lasted about one hour, with no intraoperative complications.

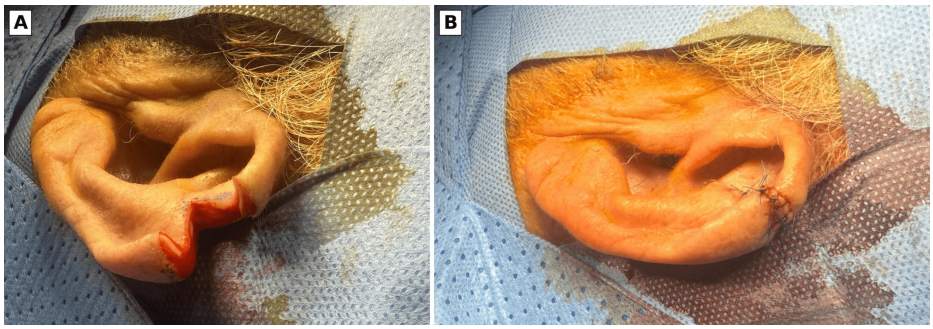


FIGURE 2: Wedge excision defect and primary closure

(A) Full-thickness wedge defect of the left helix after excision of the lesion with the underlying cartilage. (B) The helical rim at the end of the procedure, after primary closure with 5-0 Prolene® polypropylene sutures.

The excised specimen was sent for histopathological examination (Figure *3*). Macroscopically, it was a skin-covered whitish mass with a horn, measuring 3.4 × 1.5 × 1.0 cm, with a skin ellipse of 1.5 × 1.1 cm; the cut surface showed white, chalky material, and the entire specimen was submitted for examination. Microscopically (Figure *4*), sections showed a symmetric, exo-endophytic, cup-shaped squamous proliferation with a large central keratin-filled crater surrounded by prominent lateral epidermal lips. The lesion was composed of well-differentiated squamous cells with prominent keratinization, abundant glassy eosinophilic cytoplasm, and minimal cytological atypia, with occasional dyskeratotic keratinocytes and rare

intraepidermal microabscesses. The tumor base exhibited a smooth, pushing border with the dermis, except in one small area, and a dense chronic inflammatory infiltrate of lymphocytes, histiocytes, eosinophils, and occasional plasma cells was present at the base. There was no conspicuous infiltrative growth and no perineural or lymphovascular invasion. The background dermis showed minimal solar damage, and the surgical resection margins were free of tumor. The diagnosis of a completely excised keratoacanthoma was made by a consultant dermatopathologist.

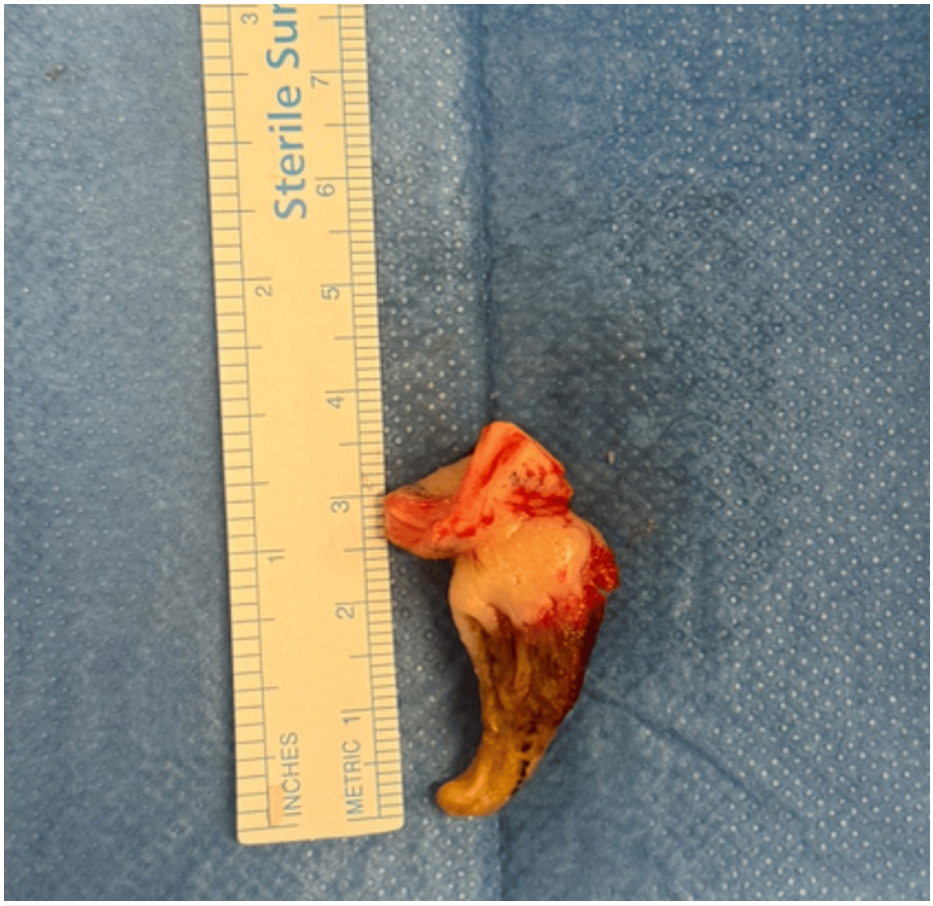


FIGURE 3: Excised specimen

The excised lesion with its horn-like keratin projection, shown beside a surgical ruler for scale.

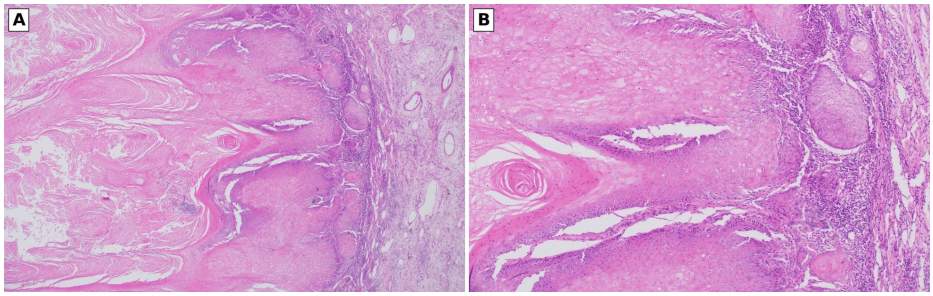


FIGURE 4: Histopathology of the lesion (hematoxylin and eosin)

(A) Low-power view showing a well-differentiated squamous proliferation with a central keratin-filled crater (left) and a dense chronic inflammatory infiltrate at the base of the lesion (right) (original magnification ×100). (B) Higher-power view showing keratinocytes with abundant glassy eosinophilic cytoplasm, keratin pearl formation, and the inflammatory infiltrate at the tumor base (original magnification ×200).

The postoperative recovery was uneventful. At the two-week follow-up, the patient reported no complaints, and the examination findings were normal. At the six-week follow-up, there was no evidence of recurrence.

Discussion

This case illustrates the diagnostic challenge posed by a cutaneous horn of the ear. A cutaneous horn should be treated as a clinical sign rather than a diagnosis because its appearance alone cannot determine the underlying lesion. In Yu et al., four features were associated with premalignant or malignant pathology at the base: older age, male sex, location on sun-exposed sites including the pinnae, and a wide base or low height-to-base ratio [1]. Our patient had three of these features: advanced age, male sex, and a lesion on the helix, which supported complete excision rather than simple removal of the horn. Mantese et al. recommended surgical excision followed by histopathological examination of all cutaneous horns [2].

A keratotic lesion of the helix in an elderly patient has several important differential diagnoses, which are summarized in Table *1*. The most important is cutaneous squamous cell carcinoma, because it may also present as a cutaneous horn, may be clinically indistinguishable from keratoacanthoma, and carries a higher risk of local recurrence and metastasis when it arises on the ear [6]. Histologically, squamous cell carcinoma is favored by infiltrative growth, marked cytological atypia, and perineural invasion. In the present case, there was no conspicuous infiltrative growth or perineural invasion, and cytological atypia was minimal. The possibility of squamous cell carcinoma was the main reason for complete excision. Hypertrophic actinic keratosis is the most common premalignant lesion found at the base of a cutaneous horn on sun-damaged skin and shows atypical keratinocytes confined to the epidermis [1,2]. Basal cell carcinoma is common on the auricle, but it usually presents as a pearly nodule with telangiectasia and little keratin, and histology shows basaloid cell islands with peripheral palisading. Chondrodermatitis nodularis helicis typically affects the helix of older men, but it presents as a small, painful nodule with a central crust over degenerated cartilage, unlike the larger, painless lesion in our patient [7]. Benign lesions such as verruca vulgaris and seborrheic keratosis may also develop into cutaneous horns [1]. Because these conditions overlap clinically, the final diagnosis depends on histopathological examination of the lesion base.

Diagnosis	Typical clinical features	Key histological features	Relevance to this case
Squamous cell carcinoma	Indurated keratotic nodule or ulcer on sun-damaged skin; may form a cutaneous horn	Infiltrative growth, marked atypia, possible perineural invasion	Most important; not favored given the predominantly pushing border, with a small focal exception, minimal atypia, and no perineural invasion
Keratoacanthoma	Rapidly growing dome-shaped nodule with central keratin plug	Symmetric cup-shaped lesion, central keratin crater, epidermal lips, glassy cytoplasm	Final diagnosis
Hypertrophic actinic keratosis	Rough scaly papule on sun-exposed skin; common base of cutaneous horns	Atypical basal keratinocytes confined to the epidermis	Considered; histology showed keratoacanthoma architecture instead
Basal cell carcinoma	Pearly nodule with telangiectasia; usually little keratin	Basaloid islands with peripheral palisading	Considered; lesion was strongly keratotic
Chondrodermatitis nodularis helicis	Small painful nodule with central crust on the helix of older men	Epidermal ulceration over degenerated cartilage	Considered; lesion was painless and larger
Verruca vulgaris / seborrheic keratosis	Benign papillomatous or stuck-on keratotic lesion	Papillomatosis, koilocytes, or horn cysts	Benign causes of cutaneous horn

TABLE 1: Most important differential diagnoses of a keratotic lesion of the helix

Clinical and histological features of the main differential diagnoses considered in this patient, and their relevance to the final diagnosis of keratoacanthoma. Data compiled from [1-7].

Clinically, keratoacanthoma is classically characterized by rapid growth over weeks, followed by potential spontaneous regression [3,8]. The lesion in our patient grew more slowly, over several months, but the prominent horn-like keratin projection was associated with a large central keratin-filled crater on histopathological examination. Our patient's age, history of sun exposure, and the exposed location of the lesion were consistent with the typical profile of keratoacanthoma.

Histopathological evaluation remains the gold standard for distinguishing keratoacanthoma from squamous

cell carcinoma. Features such as symmetry, a cup-shaped configuration with a central keratin-filled crater and overhanging epidermal lips, glassy eosinophilic cytoplasm, minimal atypia, and a smooth, pushing deep border are associated with keratoacanthoma, whereas infiltrative growth, marked atypia, and perineural invasion raise concern for squamous cell carcinoma [4,5]. Our case showed the characteristic architecture of keratoacanthoma (Figure 4), without perineural or lymphovascular invasion, but the pushing border was not maintained in a small focal area of the tumor base. Because keratoacanthoma may contain or be associated with conventional squamous cell carcinoma [5], the diagnosis depended on assessment of the entire lesion by a dermatopathologist, which was possible only because the lesion had been completely excised. A shave or superficial biopsy of the horn alone would not have allowed this assessment, which is why excision of the entire base of a cutaneous horn has been recommended [9].

Several treatment options have been described for keratoacanthoma. Surgical excision with clear margins is the first-line treatment because it is both diagnostic and curative. Mohs micrographic surgery may be preferred for lesions in cosmetically or functionally sensitive sites, whereas intralesional agents such as methotrexate or 5-fluorouracil and radiotherapy are generally reserved for patients who are not surgical candidates [3]. However, these non-excisional approaches do not provide a complete specimen for histological assessment of the base of the lesion. Although a systematic review of reported cases concluded that keratoacanthoma generally behaves in a benign manner [10], observation for spontaneous regression is not advisable, because keratoacanthoma cannot be reliably distinguished from squamous cell carcinoma on clinical grounds, and regression may leave a disfiguring scar [3]. In our patient, complete excision was therefore the most appropriate choice.

From an otolaryngological perspective, auricular lesions warrant careful consideration. On the helical rim, the thin skin lies directly on the cartilage, so complete removal of the lesion base requires excision of the underlying cartilage, and squamous cell carcinoma at this site carries a higher risk of recurrence and metastasis [6]. Wedge excision allows complete removal while enabling primary closure, and trimming excess cartilage reduces tension and helps preserve the rim contour. In this case, wedge excision provided both diagnostic clarity and therapeutic benefit, and the absence of recurrence at six-week follow-up was consistent with a favorable short-term outcome.

The main limitation of this report is the short six-week follow-up. Longer clinical follow-up is advisable to detect local recurrence or new lesions, particularly given the uncertain biological behavior of keratoacanthoma and the focal loss of the pushing border at its base.

Conclusions

This case of keratoacanthoma presenting as a cutaneous horn of the helix highlights three key clinical lessons. First, a cutaneous horn is a clinical sign rather than a diagnosis and may conceal premalignant or malignant pathology at its base, particularly when located on the ear of an elderly man. Second, keratoacanthoma may be difficult to distinguish from squamous cell carcinoma, both clinically and histologically, and actinic keratosis, basal cell carcinoma, verruca vulgaris, and chondrodermatitis nodularis helicis should also be considered. Third, complete excision of the lesion, including its base and the underlying cartilage of the helix, allowed comprehensive histopathological assessment and established the diagnosis in this patient. As a single case with short follow-up, these observations should be interpreted with caution, and continued follow-up is advisable.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Omar Altawash, Mohamed Zahran

Acquisition, analysis, or interpretation of data: Omar Altawash

Drafting of the manuscript: Omar Altawash

Critical review of the manuscript for important intellectual content: Omar Altawash, Mohamed Zahran

Supervision: Mohamed Zahran

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **AI use statement:** The authors used Claude as follows: language polishing, structure or formatting, extensive copy editing or writing support, literature comparison in Abstract,

Introduction, Case Presentation, including, Figures 1-4 (cropping, resizing, and panel labels only), Discussion, including Table 1, Conclusions, and References. All AI-assisted content was reviewed by the authors against the patient's clinical records, the operation note, and the histopathology report. Every reference was checked against its original source and DOI, and all figures were confirmed to show the patient's own unaltered images. The authors confirm that they have reviewed and verified all AI-assisted content and take full responsibility for the work. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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