

The Great Mimicker: Chondrodermatitis Nodularis Helicis Presenting as Malignancy and Managed by Mohs Surgery

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ABSTRACT Chondrodermatitis nodularis helicis (CNH) is a benign, painful, inflammatory condition of the external ear characterized by a solitary, hyperkeratotic, central-crust nodule primarily affecting the helix or antihelix. We present a case of CNH clinically mimicking basal cell carcinoma, which was successfully identified and definitively cleared using Mohs micrographic surgery, resulting in immediate symptomatic relief and an optimal aesthetic outcome.

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KEY WORDS: auricle, basal cell carcinoma, chondrodermatitis nodularis helicis (CNH), malignancy, Mohs surgery

Chondrodermatitis nodularis helicis (CNH) is a benign, painful, inflammatory condition of the external ear characterized by a solitary, hyperkeratotic, central-crust nodule primarily affecting the helix or antihelix. First described by Winkler in 1915 [1], it was historically thought to result from degenerative changes in the cartilage. More recently, the pathogenesis of CNH was found to involve localized microvascular ischemia [2]. The unique anatomy of the auricle, featuring tightly bound skin with sparse subcutaneous tissue overlying an avascular cartilage, renders it highly vulnerable to environmental insults including chronic pressure, cold exposure, actinic damage, and minor trauma. These insults trigger a cascade of perichondrial vasculitis, leading to transepidermal elimination (TEE) of degenerate, necrotic cartilage, driving a persistent inflammatory response [3].

Due to its clinical presentation, as an ulcerated, indurated nodule on a chronically sun-exposed skin, CNH frequently mimics keratinocyte carcinomas, most notably squamous cell carcinoma (SCC) and basal cell carcinoma (BCC). Distinguishing CNH from these ma-

lignancies based on clinical examination alone is notoriously difficult, often necessitating a biopsy or presenting as a diagnostic surprise during definitive surgical intervention.

While conservative approaches such as pressure-relieving pillows, topical or intralesional corticosteroids [4], and topical vasodilators like 2% nitroglycerin ointment [5] can be utilized, refractory cases often require surgical intervention. Traditional surgical modalities, including wedge excisions, simple ellipses, carbon dioxide laser ablation, and blind curettage, carry distinct disadvantages. Wide excisions frequently result in prominent aesthetic deformities of the auricle, whereas sub-total or blind cartilage smoothing carries recurrence rates as high as 38% [6], typically driven by the inadvertent retention of sub-clinical, degenerate perichondrial foci or necrotic cartilage along the surgical margins.

Mohs micrographic surgery (MMS) is globally recognized as the gold standard for the treatment of cutaneous malignancies due to its 100% peripheral and deep margin evaluation and superior tissue conservation. While traditionally reserved for malignant neoplasms, the precise, micrographic margin control offered by MMS presents a highly elegant and logical solution for severe, recalcitrant, or diagnostically ambiguous cases of CNH. By utilizing frozen sections, the Mohs surgeon can meticulously trace and eradicate the exact boundaries of the diseased, necrotic cartilage plane while strictly preserving the surrounding healthy cartilage and auricular architecture.

We present a case of CNH clinically mimicking BCC, which was successfully identified and definitively cleared using MMS, resulting in immediate symptomatic relief and an optimal aesthetic outcome.

PATIENT DESCRIPTION

A 72-year-old male presented to the Mohs Micrographic Surgery unit at Assuta hospital with a tender pink, centrally crusted dome-shaped nodule overlying the left helix [Figure 1]. Under the presumptive diagnosis of a BCC, the patient was scheduled for and underwent MMS [Figure 2].

Intraoperative histopathological evaluation of the frozen section from the central portion of the lesion revealed an acanthotic epidermis and degenerated cartilage undergoing TEE [Figure 3], establishing a definitive diagnosis of CNH.

The lesion was completely cleared in a single stage of Mohs surgery. The resulting surgical defect was repaired via primary closure [Figure 4]. Postoperatively, the patient experienced immediate symptomatic relief with an excellent functional and aesthetic outcome.

COMMENT

The clinical presentation of CNH frequently overlaps with that of malignant cutaneous neoplasms, presenting a diagnostic challenge even to experienced clinicians. In

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our patient, the rapid development of a tender, centrally crusted, dome-shaped nodule on a chronically sun-damaged helical rim clinical strongly mimicked BCC. This clinical mimicry is well-documented [7]. The high-fric-

tion, sun-exposed environment of the auricle makes both CNH and keratinocyte carcinomas common in this anatomical region, frequently requiring histopathological examination

to establish an accurate diagnosis.

The pathological hallmarks of CNH are directly tied to its ischemic, pressure-induced etiology [3]. Histological analysis of the frozen section in our case demonstrated classic features: epidermal acanthosis, a central hyperkeratotic plug, perichondrial chronic inflammation, and localized necrosis of the underlying auricular cartilage. The hallmark feature of TEE was clearly visible, representing the extrusion of degenerate, calcified, or necrotic cartilage fragments acting as foreign bodies through a compromised epidermal canal.

Traditionally, surgical management of refractory CNH has relied on standard elliptical excision or wedge resection, both of which have notable limitations. While a wedge excision provides complete clearance of the affected tissues, it inflicts significant cosmetic morbidity, fre-

Figure 1. A tender pink, centrally crusted dome-shaped nodule overlying the left helix



Figure 2. Results after MMS
MMS = Mohs micrographic surgery

[A] Clinical defect following first stage MMS



[B] On the left, center of the lesion and on the right, lesion margins of first stage MMS

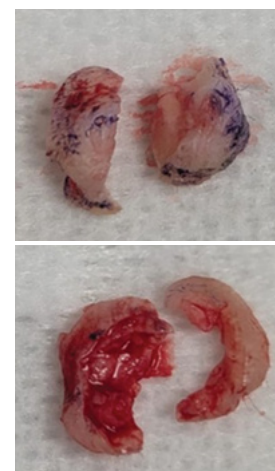
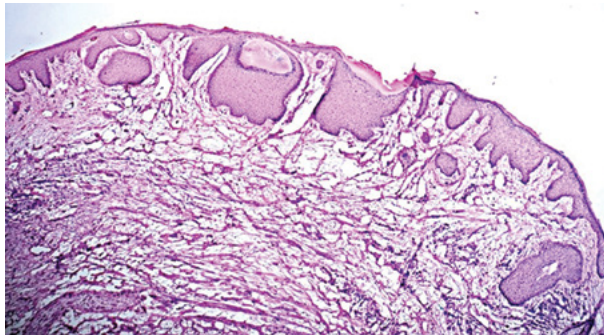
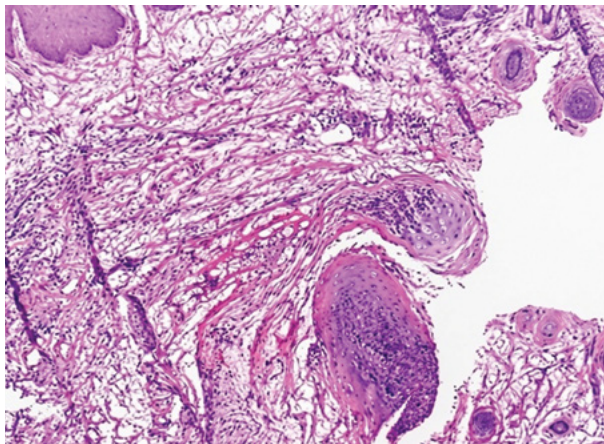


Figure 3. Histopathological findings of the intraoperative frozen sections

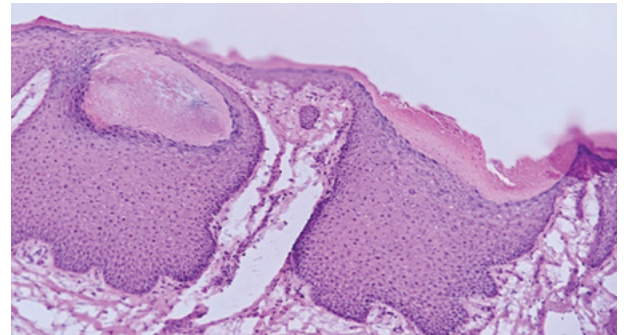
[A] Low-power view (Hematoxylin and eosin, 40×): Demonstrates marked, crater-like epidermal acanthosis and hyperkeratosis overlying a heavily inflamed dermis



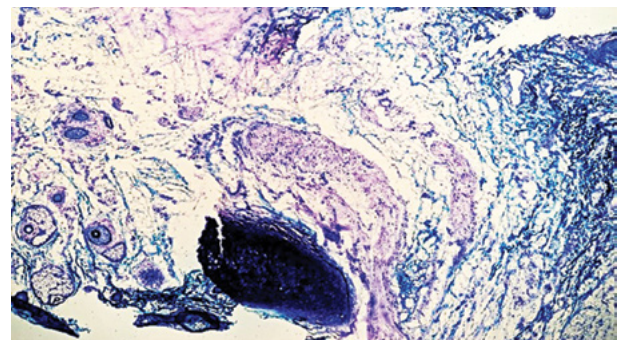
[C] High-power view (Hematoxylin and eosin, 200×): Prominent microvascular alteration, perichondrial chronic inflammation (composed of a dense lymphohistiocytic infiltrate), and focal cartilage degeneration



[B] Medium-power view (Hematoxylin and eosin, 100×): Central invagination and the hallmark diagnostic feature of transepidermal elimination; a prominent, ulcerated keratinous plug is visible, through which degenerating dermal collagen and necrotic cartilage debris are extruded toward the epidermal surface



[D] Intraoperative frozen section stained with toluidine blue (100×): Highlights the structural boundaries of the auricular cartilage. The metachromatic properties of the toluidine blue stain clearly delineate the acidic mucopolysaccharides of the cartilage matrix (deep blue/purple) from the adjacent soft tissues, demonstrating localized perichondrial degeneration and allowing the surgeon to precisely map and control the surgical margin



quently leaving the patient with a notch deformity or structural asymmetry of the ear. Conversely, more conservative techniques, such as blind cartilage shaving or curettage without microscopic margin assessment, preserve tissue but are plagued by recurrence rates ranging from 10–38%. These high recurrence rates are primarily driven by the retention of sub-clinical, microscopic foci of necrotic cartilage or inflamed perichondrium that act as persistent triggers for inflammation.

The use of MMS in this case represents an elegant, highly effective, and tissue-sparing solution to these his-

torical surgical limitations. Although MMS is classically reserved for cutaneous malignancies, its core principles of 100% peripheral and deep margin evaluation and maximal tissue conservation apply perfectly to severe or

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diagnostically ambiguous CNH. By evaluating the horizontal frozen sections intraoperatively, we were able to microscopically

confirm the complete eradication of the necrotic cartilage plane and surrounding perichondrial inflammation. This meticulous margin control ensured that no micro-foci of diseased tissue were left behind, eliminating the main reason for postoperative recurrence.

Figure 4. Primary closure of the surgical defect

It is important to contextualize our approach considering existing literature regarding the relationship between surgical intervention and CNH. Specifically, Armenta et al. [8] documented cases where CNH was a postoperative complication following MMS and radiation therapy for SCC. This phenomenon was thought to occur due to compression trauma related to surgery from a wound dressing, which compromised the localized microvasculature and triggered cartilage ischemia. Adjuvant radiation may have also had an impact. However, we reject the notion that surgical intervention inherently dooms the patient to post-surgical CNH. When CNH is the primary target of the procedure, MMS acts as an ideal therapeutic tool rather than a trigger. Traditional wide wedge excisions require aggressive tissue removal and high-tension closures that heavily restrict microvascular flow, thereby promoting ischemia. In contrast, MMS minimizes the surgical footprint by only removing microscopically confirmed diseased cartilage. By sparing healthy surrounding tissues, MMS avoids the extensive scarring and high-tension wound closures that drive post-surgical ischemic complications in the first place.

Furthermore, because MMS prioritizes the preservation of healthy tissue, the surgical defect remained exceptionally small. Rather than requiring a complex reconstructive flap or a cosmetically altering wedge closure, the conservative defect in our patient was easily closed via simple

primary approximation. This resulted in an outstanding aesthetic outcome that perfectly preserved the natural contour and symmetry of the pinna, while yielding immediate, definitive relief of the patient's chronic pain.

To the best of our knowledge, this is the first article documenting the successful utilization of MMS as a primary, intentional therapeutic modality for the treatment and cure of CNH.

CONCLUSIONS

While traditionally reserved for cutaneous malignancies, MMS offers a highly elegant, tissue-sparing solution for refractory CNH. By utilizing intraoperative frozen-section margin control, the surgeon can precisely map and completely excise the underlying focus of necrotic cartilage and perichondrial vasculitis. This single-stage approach minimizes the risk of recurrence while optimally preserving the delicate cosmetic and structural architecture of the external ear.

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If Galileo had said in verse that the world moved, the Inquisition might have let him alone.

Thomas Hardy (1840–1928), English novelist and poet