Gnatophyma and Otophyma

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Background: **Phymas are slowly progressive, disfiguring disorders of the face and ears that represent the end stage of rosacea. The most common phyma is rhinophyma, yet similar swellings may occur on the chin (gnatophyma), forehead (metophyma), one or both ears (otophyma), and eyelids (blepharophyma).**

Objective: **Unlike rhinophyma, otophyma is rarely seen. We report two rare phymas: a case of gnatophyma and a case of otophyma.**

Methods: **A 56-year-old African American man presented with a history of bumps on his chin that had begun about 7 years earlier. Physical examination was remarkable for lobulated plaques on the chin, coalescing into hypertrophic nodules and dilated pores. A 73-year-old African American male presented with bilateral cauliflower-like earlobe growths for the past 17 years.**

Results: **A skin biopsy was performed for each patient demonstrating cystic follicular dilatation with keratin plugging, dermal scarring, psoriasiform epidermal hyperplasia, and chronic inflammation of some of the follicles.**

Conclusion: **This case report describes a relatively rare gnatophyma and otophyma. Surgical management is well accepted as the best mode of therapy to treat rhinophyma and is becoming a first-line treatment for all phymas.**

Antécédents: **Les phymas sont une classe de maladies cutanées, à progression lente, qui défigurent le visage et les oreilles et représentent le dernier stade de la rosacée. Le phyma le plus commun est le rhinophyma, quoique des gonflements pareils puissent survenir au niveau du menton, (gnatophyma), du front (métophyma), de l'une ou des deux oreilles (otophyma), et des paupières (blépharophyma).**

Objectif: **Contrairement au rhinophyma, l'otophyma est rare. Nous présentons deux cas de phymas: un gnatophyma et un otophyma.**

Méthodes: **Un Afro-américain de 56 ans s'est présenté avec des bosses sur le menton dont l'apparition remonte à il y a 7 ans. L'examen physique a révélé des plaques lobées au niveau du menton, et une coalescence avec des nodules hypertrophiques et des pores dilatés. Un Afro-américain de 73 ans présente, depuis 17 ans, des excroissances au niveau des lobes, en forme de chou-fleur.**

Résultats: **La biopsie cutanée pratiquée pour chacun des patients a révélé une dilatation des kystes folliculaires avec bouchon de kératine, une cicatrisation dermique, une hyperplasie épidermique psoriasiforme ainsi qu'une inflammation chronique de certains follicules.**

Conclusion: **Le présent rapport de cas décrit un gnatophyma et un otophyma relativement rares. Le recours à la chirurgie dans la gestion du rhinophyma et des autres phymas est accepté comme le meilleur moyen thérapeutique.**

PHYMAS, from the Greek word meaning "growth," are slowly progressive, disfiguring disorders of the face and ears that represent the end stage of rosacea. The most common phyma is rhinophyma, yet similar swellings may occur on the chin (gnatophyma), forehead (metophyma), one or both ears (otophyma), and eyelids (blepharophyma).[1] These variant phymas are sporadically identified in the literature, but images of these variants are not often seen.[2] We report two rare phymas: a case of gnatophyma and a case of otophyma.

Case Reports

Case 1

A 56-year-old African American man presented with a history of bumps on his chin that had begun about 7 years earlier. He was previously diagnosed with pseudofolliculitis barbae with keloidal change and was treated with intralesional triamcinolone without much benefit. Physical

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examination was remarkable for lobulated plaques on the chin, coalescing into hypertrophic nodules and dilated pores (Figure 1). A skin biopsy was performed that demonstrated cystic follicular dilatation with keratin plugging, dermal scarring, psoriasiform epidermal hyperplasia, and chronic inflammation of some of the follicles (Figure 2). Given these clinical and histologic findings, he was diagnosed with gnatophyma.

Case 2

A 73-year-old African American male presented with a 20-year history of hidradenitis suppurativa treated with antibiotics and surgical excision. He had had bilateral earlobe growths for the past 17 years. There was no history of repeated trauma or recurrent episodes of inflammation affecting the ear or other cartilaginous structures. Physical examination revealed enlargement and redness of the nose and both earlobes, with severe cauliflower-like deformity greater in the left ear. Mild purulent discharge was present from both earlobes (Figure 3).

A punch biopsy of the left earlobe revealed a superficial and deep perivascular dermatitis and perifolliculitis with numerous plasma cells and dermal fibrosis. There was mild epidermal hyperplasia and nonspecific perifollicular and perivascular inflammation with occasional foci of tuberculoid granulomatous areas. Dilated capillaries were present, along with foci of neutrophils high and within the follicle. Steiner, acid-fast, and periodic acid–Schiff stains were negative. No *Demodex* mites were seen in the follicles. An ophthalmic examination was normal. Based on these findings, a diagnosis of otophyma was given (Figure 4).

Figure 1. Lobulated plaque on the chin.

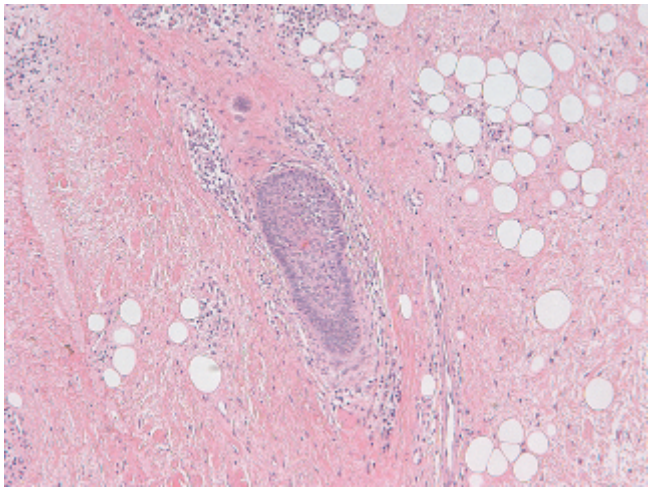

Figure 2. Chronic perifollicular infiltrate, hematoxylin and eosin stain, 40× magnification.

Discussion

Rosacea is a common chronic inflammatory acneiform pathology of the facial pilosebaceous units that affects an

Figure 3. Lobulated plaques on the ear.

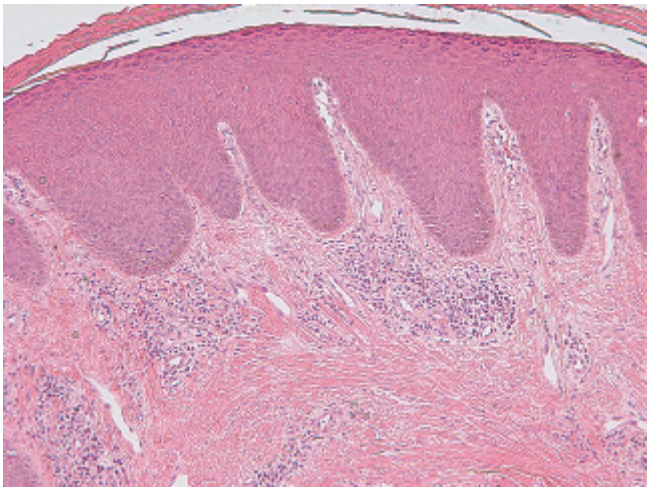

Figure 4. Epidermal hyperplasia and perivascular inflammation, hematoxylin and eosin stain, 40× magnification.

estimated 45 million people worldwide and approximately 10% of fair-skinned people (skin phototypes I and II).[3] Typically present in individuals of northwestern European descent, rosacea has been nicknamed the ''curse of the Celts'' by some in Ireland. Rosacea affects both sexes but is almost three times more common in women and has an age at onset between 30 and 60 years, with peak incidence between 40 and 50 years. Although it is more common in women, those most severely affected are men.[4] Rosacea begins as erythema on the central face and across the cheeks, nose, or forehead but only rarely affects the neck, chest, or back. It is characterized by the presence of erythema, telangiectases, and superficial pustules but is not associated with the presence of comedones. The disorder can be confused and coexist with acne vulgaris and/or seborrheic dermatitis. The presence of a rash on the scalp or ears suggests a different or coexisting diagnosis as rosacea is primarily a facial diagnosis.

Two classification schemes are used when referring to rosacea (Table 1). The first is the Plewig and Kligman Classification of the stages of rosacea.[5] Stage I is displayed by persistent erythema with telangiectases, stage II is the addition of papules and tiny pustules, and stage III is defined as persistent deep erythema, dense telangiectases, papules, pustules, and nodules.[6] The second classification scheme identifies four rosacea subtypes: erythematotelangiectatic, papulopustular, phymatous, and ocular. Patients may have more than one subtype present, often developing in succession.[7,8] A consensus committee and review panel of 17 medical experts worldwide identified these four subtypes of rosacea, defined as common patterns or groupings of signs and symptoms.[9] Although rosacea may

Table 1. Classification of Rosacea

Plewig and Kligman Classification[5]	*Consensus Classification*
Stage I: persistent erythema with telangiectasia	Type 1: erythematotelangiectatic rosacea. Permanent redness (erythema) with a tendency to flush and blush easily. It is also common to have small blood vessels visible near the surface of the skin (telangiectasias) and possibly burning or itching sensations.
Stage II: papules and small pustules	Type 2: papulopustular rosacea. Some permanent redness with red bumps (papules) with some pus filled (pustules) (which typically last 1–4 days); this subtype can be easily confused with acne.
Stage III: persistent deep erythema, telangiectasia, papules, pustules, and nodules	Type 3: phymatous rosacea. This subtype is most commonly associated with rhinophyma, an enlargement of the nose. Symptoms include thickening skin, irregular surface nodularities, and enlargement. Phymatous rosacea can also affect the chin (gnatophyma), forehead (metophyma), cheeks, eyelids (blepharophyma), and ears (otophyma).[1] Small blood vessels visible near the surface of the skin (telangiectasias) may be present.
	Type 4: ocular rosacea. Red, dry, and irritated eyes and eyelids. Other symptoms include foreign body sensations, itching, and burning.

or may not evolve from one subtype to another, each individual sign or symptom may progress from mild to moderate to severe. Early diagnosis and treatment are therefore recommended.

Rosacea of very long standing may lead to slowly progressive, disfiguring, lobulated connective tissue hyperplasia, particularly of the nose (rhinophyma) and less frequently of the chin (gnatophyma), forehead (metophyma), one or both ears (otophyma), and eyelids (blepharophyma). The skin is thickened with prominent follicles from which foul-smelling thick sebum can be expressed. Many rhinophymas have been reported in the

English literature, including cases of giant rhinophymas,[10–12] but few of the other phyma types have been recorded, such as gnatophyma[1,2,13] and otophyma.[1,14–17] A recent article reported a case of giant rhinophyma associated with otophyma, zygophyma, and ophthalmic disease.[12]

The pathophysiology of rhinophyma begins with vascular instability in the skin.[18] Fluid loss into the dermal interstitium and matrix is thought to initiate inflammation and fibrosis.[18,19] The nasal skin thickens concurrently with dermal and sebaceous gland hyperplasia. Dilated sebaceous ducts become cystic and eventually plugged with sebum. Nonrhinophymatous phymas share a similar pathophysiology that includes the sequelae of chronic edema and its related connective tissue and sebaceous gland hypertrophy.[1] Overall, the dermal connective tissue in the facial skin of rosacea patients is abnormal and does not seem to provide structural support for the microvasculature coursing through it.

Routine light microscopy of histologic sections of the skin of patients with erythematotelangiectatic rosacea demonstrates irregularly dilated capillary vessels in the upper dermis alongside disorganization of the dermal collagen and a lack of fibrillarity.[20] Furthermore, histopathology shows lymphocytic perifollicular infiltrates surrounding dilated follicular infundibula with prominent sebaceous glands.[17] The histopathologic study of 47 cases with rhinophyma by Acker and Helwig reported follicular plugging and a predominantly lymphocytic infiltration in every case.[21] In addition, they found sebaceous gland hyperplasia in 85%, scarring in 75%, acanthosis in 50%, and telangiectasia in about one-third of specimens.[21,22]

Management of rosacea and the different forms of phymas is multifold. As a preventive measure, marked reduction or elimination of alcoholic and hot beverages may be helpful in preventing the exacerbations of rosacea in some individuals.[23] Topical metronidazole, topical azeleic acid, and topical sulfur and sulfacetamide preparations are all efficacious in treating rosacea.[24] Systemic antibiotics are often more effective than topical treatment.[25] Minocycline and doxycycline, 50 to 100 mg twice daily, are the first-line antibiotics and are very effective.[25] Recently, two randomized phase III clinical trials evaluating anti-inflammatory subantimicrobial doses (a proprietary formulation of 40 mg daily) of doxycycline have been shown to be effective and safe in the management of rosacea.[26] Tetracycline, 1 to 1.5 g/d, can be prescribed in divided doses until clear and then gradually reduced to once-daily doses of 250 to 500 mg.[25] For individuals with severe disease (especially stage III) not responding to antibiotics and topical treatments, a low-dose regimen of 0.1 to 0.5 mg/kg body weight per day of oral isotretinoin is effective in most patients but, occasionally, 1 mg/kg may be required.[25]

Few treatments address both papulopustular and telangiectatic components of rosacea. When unresponsive to treatment with antibiotics, the multiplexed pulsed dye laser can be used for treatment of both papular and telangiectatic rosacea.[27] The most commonly applied system is the flash lamp–pumped pulsed dye laser.[28]

Surgical management is well accepted as the best mode of therapy to treat rhinophyma and is becoming a first-line treatment for all phymas.[29,30] It is the only effective means to significantly reduce the nodular tissue hypertrophy associated with end-stage disease.[31] Current surgical approaches include electrosurgery, scalpel excision, ablative laser resurfacing, and, to a lesser degree, cryotherapy, dermabrasion, and nonablative laser therapy.[29,32] Each therapeutic modality carries its own risks and benefits (Table 2).

Surgical treatment generally is divided between full-thickness excision and partial-thickness decortication combined with fine tissue sculpting. The former requires repair of the wound through primary closure, adjacent tissue

Table 2. Surgical Treatment Options for Phymas

Procedure	*Comments*
Full excision	May result in large defects that require closure, high risk of intraoperative bleeding, poor cosmetic outcome
Partial-thickness decortication with tissue sculpting	Bleeding, scarring
Electrosurgery	Poor wound healing, dyspigmentation, scarring
Cryosurgery	Poor control of depth
1,450 nm diode laser	Good only for superficial phymas, insufficient depth for larger phymas
CO_2 laser	Good results but may require longer treatment times compared with standard surgical approaches
2,940 nm Er:YAG laser	Good results but may require longer treatment times compared with standard surgical approaches
1,450 nm diode laser	Good only for superficial phymas, insufficient depth for larger phymas

transfer, or skin grafting, whereas the latter relies on intact adnexal structures to reepithelialize the debulked tissue.

Full-thickness excision is commonly performed using a ''cold knife'' or standard scalpel to debulk the entire affected area. Complete excision is recommended when large tumors are suspected to have malignancy.[33] Full-thickness excisions require closure of the defect with a skin graft or local flap.[34] The appropriate closure will depend on the resultant size of the defect and the number of cosmetic units affected. Although the results may be dramatic, significant morbidity may be associated.[13] Complications may include excessive intraoperative bleeding, tissue ischemia with local flaps or grafts, scarring, and color, contour, and texture mismatch of the transferred skin. Additional surgical methods with the heated Shaw knife, Weck blade, harmonic blade, and ultrasonic knife have been shown to be useful in the treatment of rhinophyma.[29]

Partial-thickness decortication and tissue sculpting through various methods have replaced full-thickness excision as a preferred surgical approach. Dermaplaning and dermabrasion are two common approaches that have been effectively used for many years.[35,36] The former involves the removal of superficial layers of tissue through serial shaving with a knife or sharp blade. In this setting, the rhinophyma is shaved off tangentially, debulking the tissue to a level approaching the normal contour of the underlying anatomy. The residual deep pilosebaceous appendages remain to reepithelialize the treated area. Subsequent sculpting with dermabrasion, laser surgery, or electrosurgery can provide further refinement to smooth contour irregularities. Decortication should never proceed below the level of the pilosebaceous unit if the normal adnexa are to be spared for proper reepithelialization. Manual expression of sebum through pressure applied below or from the sides of the affected area is a quick intraoperative test to signify that the fundus of the sebaceous glands remains intact. Bleeding is a possibility in scalpel excision and dermabrasion, along with the remnant of a scar in the aesthetic location.

The ideal treatment and prevention of local recurrence of phymas are to replace the affected skin.[13] Skin grafting has the problem of discoloration, and local flaps cannot be used owing to the lack of healthy surrounding skin in rhinophyma.[13] In cases of gnatophyma, the adjacent skin of the submental region belongs anatomically to the neck and thereby lacks sebaceous glands. Coverage of the defect by an advancement flap using the intact submental skin, including the platysma, has led to an excellent result.[13]

Electrosurgery uses alternating high-frequency electric current to cut, coagulate, desiccate, or fulgurate tissue. In this setting, the electric current heats the tissue through a ''cold'' probe or wire loop. The mixed current cut/coagulate mode of electrosurgery has been shown to successfully cut and debulk hyperplastic tissue while simultaneously coagulating a hypervascularized dermis.[37] Electrocautery, in contrast, uses a direct current to heat a probe that directly heats or burns tissue. The potential pitfall of either method is collateral damage from excess thermal diffusion, which can lead to delayed wound healing, pigmentary disturbances, or possibly denaturing of collagen to the point of scarring.[38] Electrocautery generates extreme heat that may damage underlying structures.[39,40] Cryosurgery also has its advocates.[41–43] Cryosurgery is limited by depth control, whereas laser modalities are not meant for large-sized lesions.[29,30] Laser therapy has become very popular in the treatment of rhinophyma. Laser therapy has the advantage of precise control of depth and extent of vaporization, in addition to involving only topical anesthesia. Copper-bromide, krypton, and KTP lasers have been used effectively.[28,44] In the recent past, the 1,450 nm diode infrared laser has been used for the treatment of active acne, atrophic acne scarring, sebaceous hyperplasia, and periorbital rhytides.[45,46] The 1,450 nm infrared diode laser uses a pulse consisting of four bursts of infrared laser at 1,450 nm interspersed with five bursts of cryogen spray cooling. The specific wavelength primarily targets water, whereas the cryogen spray allows for preservation of the epidermis, minimizing side effects. The energy from the laser is converted into heat in the dermis and induces secondary destruction of sebaceous glands and associated structures in the dermis while sparing the epidermis from injury.[47,48] Because the pathology of rhinophyma involves significant sebaceous hyperplasia, this nonablative technology would help treat the mild to moderate phyma cases. Significant rhinophyma would be expected to be outside the abilities of this laser to penetrate deeply enough to effect a change.

Laser surgery with the CO_2 and erbium (Er):YAG systems has become standard in surgical therapy of phymatous disease. Both systems target water as their tissue chromophore to provide tissue ablation through vaporization. The CO_2 laser at 10,600 nm, first reported by Shapshay and colleagues in 1980 in the treatment of rhinophyma, permits tissue ablation with moderate thermal diffusion of energy that serves to coagulate the hypervascularized dermis.[29,49,50] This provides a unique combination of tissue ablation and coagulation. The 2,940 nm Er:YAG laser, compared with the 10,600 nm CO_2 laser, has a wavelength that more precisely approximates water's peak absorption near 3,000 nm.[42,51] This

results in a more immediate absorption of laser energy in tissue, delivering a more precise ablation with less thermal diffusion and collateral damage. Clinically, this translates into a more precise sculpting of affected tissue, with minimal threat of overheating the dermis. At short pulse durations, however, the 2,940 nm Er:YAG laser provides little to no thermal coagulation owing to the limited thermal conduction.[51,52] In this setting, ablation into the dermis creates intraoperative bleeding, which both decreases the visual field and bathes the treatment area with a competitive chromophore in the water-rich blood. However, dual-mode Er lasers are available (Contour, Sciton Inc., Palo Alto, CA) that combine a short pulsed Er laser for precise tissue ablation with a longer pulsed Er laser on the same handpiece to generate heat conduction for thermal coagulation. Both ablation and coagulation settings may be simultaneously delivered to provide sculpting of the defect with minimal intraoperative bleeding. Combination Er:YAG and CO_2 lasers are available as well that use the Er for tissue ablation and CO_2 laser at lower power for tissue coagulation.[53] The cosmetic results of laser ablation versus partial excision through dermaplaning and electrosurgery are comparable; however, a longer treatment time with multiple passes of the CO_2 and Er:YAG lasers is needed to debulk extensive phymatous tissue.[28] As a result, many dermatologists resort to conventional surgical methods because of speed and cost-effectiveness.[28]

Har-El and colleagues retrospectively studied 23 patients who were treated with either laser or blade excision of rhinophyma.[54] The authors found no difference in operative time, pain, postoperative bleeding, overall complications, or subjectively graded aesthetic outcome, although they did prefer the laser for improved intraoperative hemostasis.[54] Greenbaum and colleagues reported three patients with rhinophyma who were each treated with a CO_2 laser on one side of their nose and with electrosurgery on the other side, resulting in comparable outcomes.[39]

If partial excision through decortication is chosen and the wound is allowed to reepithelialize, a strict wound care regimen should be followed. Daily dressing changes with Xeroform and/or topical petrolatum-based ointment should be followed until reepithelialization is complete, approximately 2 weeks. Oral antibiotics such as third-generation cephalosporins are used for prophylaxis against superinfection. Oral antivirals such as valacyclovir are prescribed if the phymatous disease is located in the perioral area.[30]

As mentioned previously, isotretinoin is a well-established medical therapy for advanced-stage rosacea. It should be noted that several case reports suggest a potential risk of hypertrophic scarring with procedures such as dermabrasion, chemical peels, and pulsed dye laser when performed in temporal proximity to isotretinoin therapy.[55–60] Although no direct causal studies have proven this, we suggest avoiding any surgical debulking or sculpting with electrosurgery, dermabrasion, or laser surgery for 12 months from the last dose of any oral retinoid.

In conclusion, rosacea is a complex inflammatory dermatosis with a myriad of clinical presentations. Rhinophyma represents the end stage of rosacea, yet phymas may also present atypically on other facial areas, such as the chin or ears. Treatment of rosacea can be achieved with topical or oral antibiotics, but phymas respond best to surgery and/or ablative lasers.

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