SKIN

BRIEF ARTICLE

Eruptive Epidermal Inclusion Cysts in a Renal Transplant Patient on Tacrolimus

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ABSTRACT

Epidermal inclusion cysts are common cutaneous lesions that can develop anywhere on the body. While benign, these cysts can become inflamed and symptomatic. Symptomatic epidermal inclusion cysts can be treated with intralesional steroid injections or antibiotics, but surgical excision is often necessary for definitive treatment. We present a unique case of tacrolimus-induced eruptive epidermal inclusion cysts on the head and trunk of an adult male post-renal transplantation. Physicians should be familiar with this potential adverse effect, especially due to the difficulty of obtaining definitive treatment for a multitude of epidermal inclusion cysts.

INTRODUCTION

Epidermal inclusion cysts (EICs), also known as epidermoid cysts or infundibular cysts, are benign growths of the skin that often present as skin-colored dermal nodules with a central punctum. EICs have a stratified squamous epithelial lining with a keratin-filled core and can result from plugging of the follicular orifice or implantation of follicular epithelium into the dermis from trauma or comedone formation.[1] These cysts can range from a few millimeters to several centimeters in diameter and are often asymptomatic, though they may spontaneously become inflamed, enlarge, or rupture. Treatment of EICs is optional, but intralesional steroid injections or antibiotics can be used to reduce inflammation. EICs have a tendency to recur, and complete surgical excision with removal of the cyst wall provides a definitive treatment option.

CASE REPORT

A 56-year-old African American male with a past medical history of hypertension, lupus, and end-stage renal disease status post renal transplantation presented to dermatology after developing an eruption of numerous cystic lesions. Following his transplant, his immunosuppressive treatment included tacrolimus 7 mg twice daily, mycophenolate mofetil 1000 mg twice daily, and prednisone 10 mg daily. He had previously been on hydroxychloroquine 400 mg daily, mycophenolate mofetil 500 mg daily, and prednisone 5 mg daily for his lupus, but hydroxychloroquine was ultimately discontinued post-transplant as his lupus had been quiescent with no cutaneous flares for years.

Four months post-transplant, the patient developed numerous subcutaneous cystic

papules on the face including the forehead, cheeks, pre and post auriculars, and neck. At that time, his immunosuppressive regimen consisted of tacrolimus, mycophenolate mofetil, and prednisone. The patient's transplant team replaced mycophenolate mofetil with leflunomide 40 mg daily six months post-transplant due to uptrending BK viremia. By eleven months post-transplant, the patient was developing cystic papules on the trunk as well.

The patient was seen by dermatology and initially diagnosed with cystic acne and acne conglobata. He was treated with topical benzoyl peroxide, topical clindamycin, and doxycycline 100 mg twice daily with no improvement over the following two months. He was then started on isotretinoin, but this was discontinued three months into therapy due to elevated triglycerides and no clinical efficacy. The patient was now seventeen months post-transplant with severe involvement of the affected areas. Physical examination showed numerous papules and cysts with visible puncta as well as diffuse open and closed comedones scattered on the face, scalp, ears, chest, and back with pitted scarring on the face, scalp, chest, and back (**Figure 1**).

A biopsy was performed from the posterior neck to determine a definitive diagnosis due to lack of response to treatment. On histology, there was a cyst with keratin debris and an epidermoid cyst wall consistent with an epidermal inclusion cyst.

DISCUSSION

Multiple cases of EIC development in solid organ transplant recipients on cyclosporine have been reported.[2] However, few cases have been reported among patients taking tacrolimus, another calcineurin inhibitor. The development of multiple EICs as a potential adverse effect of tacrolimus therapy appears to have recently been recognized, as a review of the literature showed five cases of eruptive EICs in tacrolimus-treated patients with four of the five cases having been reported within the past three years. All five cases occurred in patients who had received renal transplants, and one of the cases reported discontinuation of the patient's tacrolimus with no new cyst development subsequently (**Table 1**).[3,4,5]

Calcineurin inhibitors are commonly used for immunosuppressive therapy following solid organ transplantation and management of various autoimmune conditions.[6] Both cyclosporine and tacrolimus act via selective inhibition of calcineurin causing decreased T lymphocyte proliferation and keratinocyte apoptosis inhibition.[3] Cyst formation related to calcineurin inhibition with cyclosporine has been postulated to result from increased keratinization leading to hair follicle occlusion.[7] Given that tacrolimus and cyclosporine have the same mechanism of action, the development of EICs in tacrolimus-treated patients may result from a similar reaction.

While excision serves as an effective treatment for individual EICs, our review of the literature revealed no reported treatment options for successfully treating numerous cysts simultaneously. Given the paucity of efficacious treatments for a multitude of EICs, early discontinuation of the causative medication and alteration of the patient's immunosuppressive regimen is imperative to prevent development of new cysts in these patients.[3] Physicians should be familiar with this unique adverse effect that may be seen in transplant patients on calcineurin inhibitors.

Conflict of Interest Disclosures: None

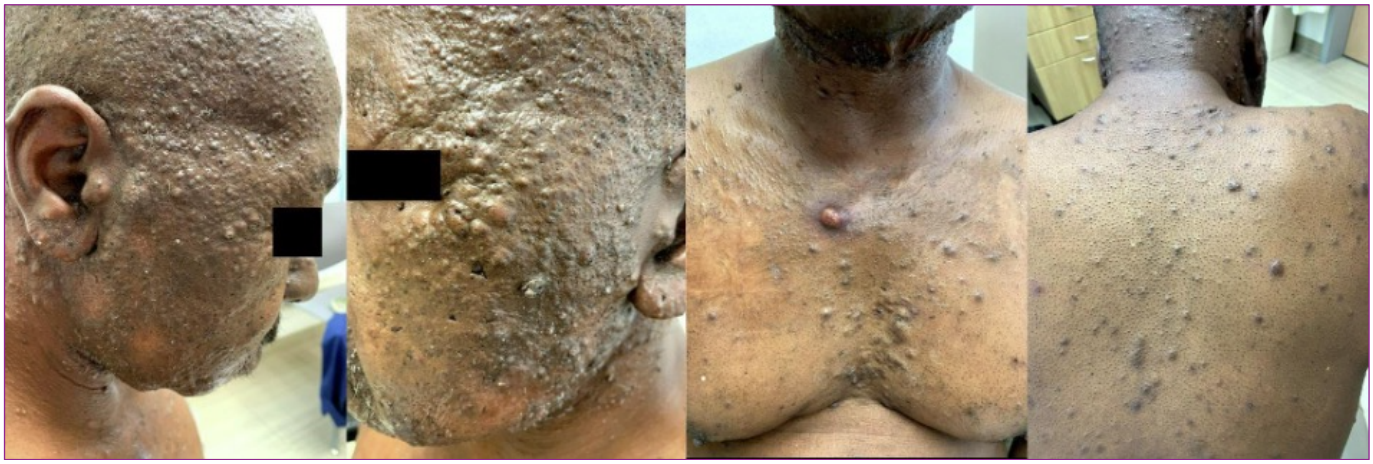

Figure 1. Numerous papules and cysts with visible puncta as well as diffuse open and closed comedones scattered on the face, scalp, ears, chest, and back with pitted scarring on the face, scalp, chest, and back.

Table 1. Previous cases of eruptive EICs in tacrolimus-treated patients.

Reference #	Age at Onset	Sex	Tacrolimus Daily Dose	Post-Transplant Time to Initial Cyst Development	Location of Cysts	# of Cysts	Biopsy Proven EIC Diagnosis
3	57 years	M	Not reported	3 months	face, chest, back, upper extremities	> 100	yes
4	44 years	M	4 mg	3 years	neck, back, buttocks	> 100	yes
5	53 years	M	3 mg	10 months	back	multiple	yes
5	46 years	M	3 mg	6 months	head, trunk, proximal extremities	multiple	no
5	80 years	M	2 mg	18 months	face	3	yes

EIC = epidermal inclusion cyst

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