SKIN

BRIEF ARTICLE

Treatment of Erythematotelangiectatic Rosacea with Laser and Topical Timolol Maleate: A Split-Face Case Study

Eryn Patin, BS[1,2], Kathyana P. Santiago Mangual, MD[3], Sepideh Ashrafzadeh, MD[1,4], Arianne Shadi Kourosh, MD, MPH[4-6] Sandy Tsao, MD[1,4]

[1] Department of Dermatology, Massachusetts General Hospital, Boston, Massachusetts, USA
[2] The University of Texas Southwestern Medical School, Dallas, Texas, USA
[3] Department of Medicine, Yale School of Medicine, New Haven, Connecticut, USA
[4] Harvard Medical School, Boston, Massachusetts, USA
[5] Department of Dermatology, Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA
[6] Harvard T.H. Chan School of Public Health, Boston, Massachusetts, USA

ABSTRACT

Introduction: Erythematotelangiectatic rosacea (ER) is the most common rosacea subtype, yet it is the most difficult to control with most standard topical and oral therapies.
Case Report: We present a case of a 63-year-old male with persistent facial burning, flushing, erythema, and telangiectasias, consistent with severe ER, unresponsive to a 10-year course of oral doxycycline. Following the twice-daily topical application of timolol maleate and two pulsed-dye laser (PDL) treatments over an 8-week period, both subjective and objective improvements in the patient's ER were observed.
Discussion and Conclusions: This case report illustrates timolol maleate as a potential adjuvant to PDL therapy for the management of severe ER. To our knowledge, this represents the first case of ER successfully treated with both timolol maleate and PDL, offering an additional treatment option for patients with this challenging disease.

INTRODUCTION

Erythematotelangiectatic rosacea (ER), characterized by episodic facial flushing and persistent centrofacial erythema and telangiectasias, is the most common subtype of rosacea, yet it is the least responsive to standard topical and oral rosacea treatments.[1] This study explores the innovative use and synergistic effects of topical timolol as an adjunctive treatment immediately following pulsed-dye laser (PDL) therapy for severe ER. Using selective photothermolysis to target superficial blood vessels and reduce erythema and telangiectasia, PDL therapy is one of the most frequently employed and effective treatments for ER.[1] Nevertheless, patients may still experience recurrences and persistent flushing with PDL therapy, often requiring routine maintenance treatments which are often costly and not covered by insurance.[2] Oral β-blockers carvedilol and propranolol have also demonstrated efficacy in reducing persistent erythema and flushing associated with ER. However, they are associated with bradycardia and hypotension so must be used with caution.[3]

Timolol maleate, a potent topical nonselective β-blocker, is commonly

employed for the treatment of infantile hemangiomas (IH) due to its minimal systemic effects, promotion of localized vasoconstriction, inhibition of angiogenic factors (e.g., vascular endothelial growth factor [VEGF]), suppression of inflammatory mediators, and induction of apoptosis.[4] Despite its anti-inflammatory and vasoconstrictive properties, few studies have investigated its efficacy in the management of ER-associated erythema and flushing.[4,5] This report presents a split-face case study where topical timolol was utilized as an adjunctive treatment to PDL therapy for addressing severe ER.

CASE REPORT

A 63-year-old male with severe ER previously managed with a 10-year course of oral doxycycline with minimal effect presented with persistent facial burning, flushing, erythema, and telangiectasias. He had previously undergone six pulsed-dye laser (PDL) treatments, with the most recent occurring one year prior to presentation, but reported a lack of significant improvement in his ER. ER severity was measured prior to treatment according to the rosacea clinical scorecard, clinician erythema assessment (CEA), and patient self-assessment (PSA) (**Table 1**).[6,7] One session of PDL was administered at 595 nm (10 ms, 7 mm spot, 9.5 J/cm^2) to the bilateral forehead, cheeks, nose, and chin, immediately followed by the topical application of timolol maleate 0.5% weeks with twice-daily topical timolol, while the right side received no further treatment. Response to therapy was assessed after a total of eight weeks of treatment using pre- and post-treatment photos, rosacea clinical scorecard, CEA, and PSA to evaluate the efficacy of the combined therapy (**Table 2**).

At the eight-week assessment, both sides of the patient's face exhibited noticeable improvement in erythema and telangiectasias (**Figure 1**). Greater improvement in telangiectasias and erythema was observed on the left side of the face, which was treated with the combination of PDL and topical timolol, particularly in the mid-cheek area. CEA and PSA scores on this side improved from 4 pre-treatment to 1 post-treatment, compared with post-treatment scores of 3 on the right side, which received PDL alone. The patient expressed overall satisfaction and subjective symptomatic relief following treatment, specifically less burning and stinging sensation, more predominant on the timolol-treated side. No local or systemic adverse events were reported during treatment or at an eight-week follow-up.

DISCUSSION

Despite being the most common rosacea subtype, ER remains challenging to treat due to the lack of interventions that safely manage persistent erythema and telangiectasias. PDL remains the gold standard for telangiectasia reduction; however, recurrence is common, and improvement in background erythema is often limited when used alone.[4] Oral β-blockers such as propranolol can reduce flushing and erythema but carry the risk of systemic adverse effects, including dizziness and bradycardia, limiting their use in many patients.[3]

A topical nonselective β-blocker, timolol maleate, offers a potential alternative with a favorable safety profile.[4] To our knowledge, this case is the first report of twice-daily topical timolol initiated immediately after PDL for severe ER. This combination treatment

Table 1. Clinical features of patient with rosacea at presentation prior to initiating treatment

Features	Scoring
Primary Features	
Flushing (Transient Erythema)	Severe (3)
Nontransient Erythema	Severe (3)
Papules and Pustules	Absent (0)
Telangiectasia	Severe (3)
Secondary Features	
Burning or Stinging	Severe (3)
Plaque	Absent (0)
Dry Appearance	Absent (0)
Edema	Absent (0)
Ocular Manifestations	Absent (0)
Phymatous Changes	Mild (1)
Physician Ratings by Subtype	
Subtype 1: Erythematotelangiectatic Rosacea (ER)	Severe (3)
Clinician Erythema Assessment (CEA) results	Severe erythema; fiery redness (4)
Patient self-assessment (PSA) results	Severe redness (4)

Table 2. Clinical features of patient with rosacea following 2 sessions (4 weeks apart) of pulse-dye laser (PDL) treatment to the bilateral forehead, cheeks, nose, and chin and 8 weeks of twice daily topical timolol maleate 5% ophthalmic solution application to the left side of the face

Features	Post-Combination Therapy (PDL+ Timolol) Score	Post-PDL Therapy Only Score
Primary Features		
Flushing (Transient Erythema)	Absent (0)	Mild (1)
Nontransient Erythema	Mild (1)	Moderate (2)
Papules and Pustules	Absent (0)	Absent (0)
Telangiectasia	Mild (1)	Moderate (2)
Secondary Features		
Burning or Stinging	Mild (1)	Moderate (2)
Plaque	Absent (0)	Absent (0)
Dry Appearance	Absent (0)	Absent (0)
Edema	Absent (0)	Absent (0)
Ocular Manifestations	Absent (0)	Absent (0)
Phymatous Changes	Mild (1)	Mild (1)
Physician Ratings by Subtype		
Subtype 1: Erythematotelangiectatic Rosacea (ER)	Mild (1)	Moderate (2)
Clinician Erythema Assessment (CEA) results	Almost clear; slight redness (1)	Moderate erythema; marked redness (3)
Patient self-assessment (PSA) results	Almost clear of unwanted redness (1)	Moderate redness (3)

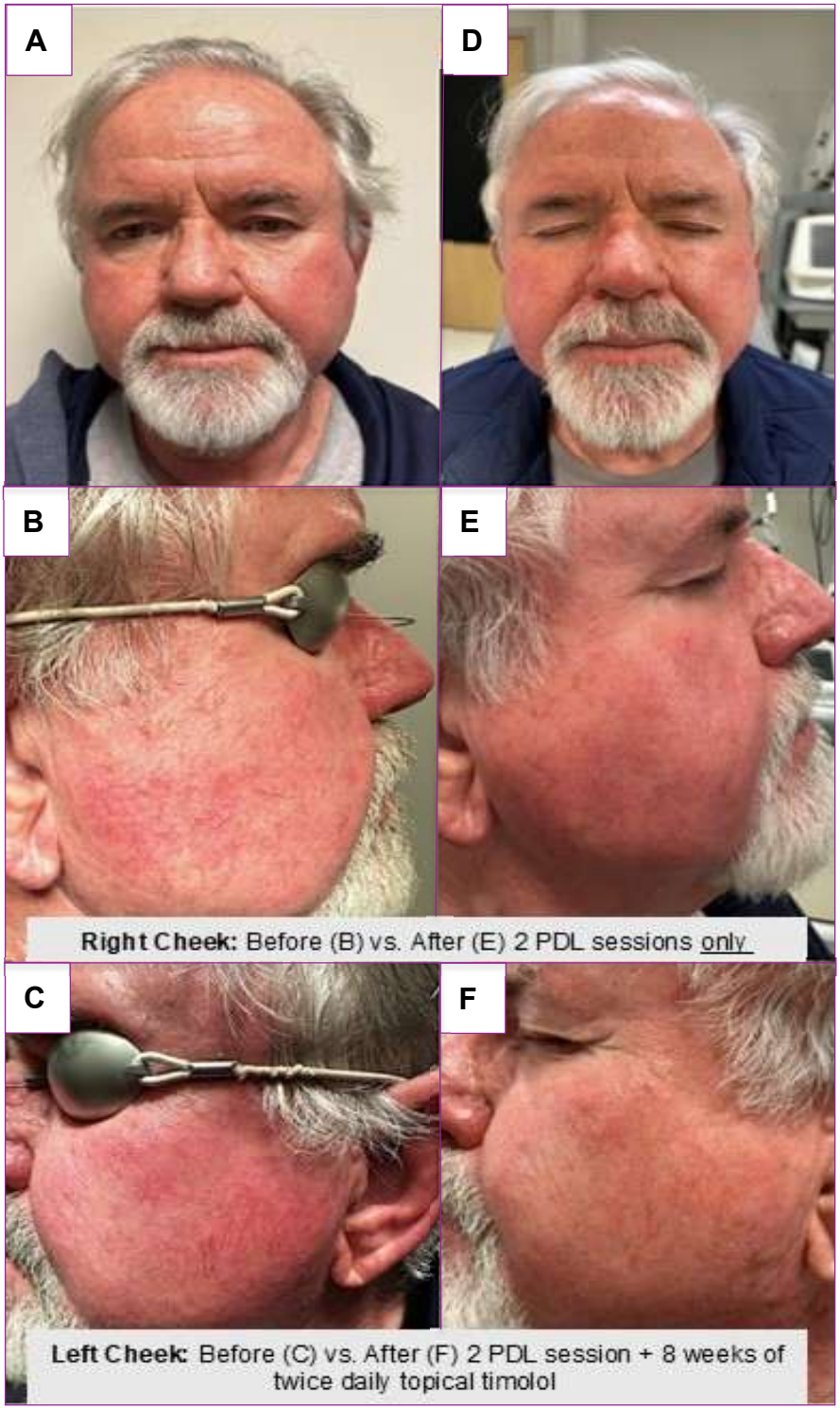

Figure 1. (A) Entire face before initiating pulse-dye laser (PDL) treatment, **(B)** Right side of face before initiating PDL treatment, **(C)** Left side of face before combination PDL and topical timolol treatment, **(D)** Entire face after 2 sessions of PDL (4 weeks apart) and twice daily application of topical timolol maleate 5% ophthalmic solution for 8 weeks)

has previously demonstrated efficacy in the management of IH.[4,8] Prior studies of once-daily topical timolol as monotherapy for rosacea revealed only modest improvements.[4,5] In one study, the Investigator's Global Assessment (IGA) scorecard revealed that of 16 patients with severe rosacea at baseline, 12 (75%) remained severe following 8 weeks of nightly topical timolol.[4] In another split-face study, baseline CEA and PSA scores >3 were not assessed, and improvements >1 point were not observed with once-daily topical timolol over 28 days.[5]

We believe these findings support the belief that both post-PDL timing and twice-daily application of timolol may be integral to the observed efficacy. PDL induces transient vascular permeability and barrier disruption, potentially enhancing local timolol penetration, while twice-daily dosing may sustain β-adrenergic blockade and prolong therapeutic benefit.[4,5,9] When considered alongside existing literature on PDL, topical timolol, and systemic β-blockers as monotherapy for rosacea, our findings suggest that the combination of PDL and topical timolol may provide an additive effect, enhancing efficacy compared with either treatment alone while maintaining a favorable safety profile.

These observations highlight additional clinical implications. By potentially enhancing and prolonging the effects of PDL, topical timolol could reduce the frequency and cost of repeat laser sessions while improving patient comfort and quality of life through decreased flushing, burning, and stinging. If validated, this strategy may hold relevance for refractory ER populations, as well as other vascular dermatoses characterized by persistent erythema or recurrent angiogenesis, including poikiloderma of Civatte, radiation-induced telangiectasias, and telangiectatic photoaging.

Nevertheless, these findings must be interpreted with caution. As a single-patient case, the results are inherently limited in generalizability. The split-face design introduces potential bias, as systemic absorption of timolol, while minimal, could theoretically influence contralateral results. Follow-up was limited to eight weeks, restricting conclusions on long-term efficacy, durability of response, and recurrence rates.

CONCLUSION

In summary, this report provides preliminary evidence that twice-daily topical timolol initiated immediately post-PDL may be a simple, safe, and affordable adjuvant to improve symptomatic control and reduce recurrence of severe ER. Compared with previously studied approaches using oral β-blockers, topical timolol, or PDL alone, this regimen may extend the therapeutic benefit of PDL without the risks associated with systemic β-blockers, potentially lowering the number of PDL sessions required and their associated costs while improving patient-reported outcomes. Larger, prospective, randomized controlled trials with extended follow-up are needed to validate efficacy, determine optimal dosing schedules, and define long-term safety in broader patient populations.

Conflict of Interest Disclosures: None

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Corresponding Author:
Eryn Patin
50 Staniford St., Boston, MA
206-849-0856
Email: epatin@mgh.harvard.edu

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