



A COMBINATION TREATMENT OF FRACTIONAL CO₂ LASER AND GLYCOLIC ACID PEEL FOR MACULAR AMYLOIDOSIS: A CASE SERIES.

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ABSTRACT

Background: Macular amyloidosis (MA) is the subtlest of the cutaneous varieties of amyloidosis. In general, the treatment of MA is disappointing. Hence, this study was aimed at effective combination treatment of macular amyloidosis. **Objective:** To determine the effect of combined treatment of fractional CO₂ laser and glycolic acid peel for macular amyloidosis. **Patients and Methods:** We present 10 cases of macular amyloidosis patients attending our Dermatology outpatient department. Our study involved Fractional CO₂ laser which was done monthly for 3 sittings along with application of 30% glycolic acid peel at an interval of 2 weeks for 6 sittings. Digital photographs were taken before treatment and at every followup visit thereafter. The response was graded as percentage reduction in pigmentation both by the patient and the observer. The patients were followed up for 2 months post treatment for improvement. **Results:** All patients had good tolerance to the procedures. Three showed an excellent (>75%) improvement and seven showed a good (50–75%) improvement. All ten were very satisfied at follow-up (8 weeks after last peel). **Conclusion:** Combination treatment of glycolic acid peel and fractional CO₂ laser is viable treatment option for Macular amyloidosis.

KEYWORDS : Macular amyloidosis; Fractional CO₂ laser; Glycolic acid peel.

INTRODUCTION

Amyloidosis is not a single disease rather, the term is used to refer to several diseases that share the common feature of abnormal extracellular deposition of amyloid, a fibrillar proteinaceous material, within the tissues.¹ MA has a characteristic female preponderance with the age of onset ranging between 21 and 50 years.² Its etiology is unknown, but many risk factors have been implicated such as UVB, EBV, race, genetic predisposition and atopy.³ It is also known as frictional amyloidosis and is contributed to, in part, by the habit of vigorous rubbing of the skin with a nylon towel or brush.³ In general, the treatment of cutaneous amyloidosis is disappointing. Various modalities such as topical corticosteroids, topical application of 10% DMSO, UVB therapy, tretinoin and acitretin therapy have been tried with some success. Certain chemical peeling agents like trichloroacetic acid (TCA), salicylic acid, Glycolic and lactic acid have been found to reduce pigmentation in MA. Fractional CO₂ laser as shown positive response in the reduction of pigmentation in MA. Hence, this study was aimed at effective combination treatment of macular amyloidosis.

Case Study:

Ten patients with a clinical diagnosis of macular amyloidosis confirmed with dermoscopy and with a history of more than three years with the disease and multiple infructuous treatments with kojic acid, hydroquinone, topical retinoids were selected.

Dermoscopy showed multiple foci of small central hubs with irregular and broken streaks radiating from the center giving a "hub-and-spoke" pattern were seen. The color of the central hub was either off-white or light brown or mottled whitish-brown. (Figure 3)

All patients signed informed consent forms. They also signed forms giving their consent for the use of case details and images for scientific purposes.

We designed a protocol involving fractional CO₂ laser and glycolic acid peeling treatment performed in the hospital along with a daily home treatment. The patients started the

combination home treatment four weeks before the procedure, to prepare the skin and avoid undesirable effects. Sunscreen containing spf 30+ in the morning and kojic acid at night was given. Hospital treatment consist of fractional CO₂ laser done monthly for 3 sitting and glycolic acid 30% peel was done (1 week post laser) 2 weekly in between lasers for 6 sittings.

Treatment protocol

Fractional CO₂ parameters (Futura RF 40, Derma India) Power 16 watts, density 0.7-1 mm, duration 3.0 ms, overlap -1, percent of coverage: 31 % in standard scanning mode.

Glycolic acid peel (1 week post laser)

The skin of the affected site was cleansed with 70% alcohol followed by acetone to degrease the skin. Following which 30% glycolic acid was applied with a cotton bud. Peel was left for duration of 8-10 mins. 6 such sittings were done with an interval of 2 weeks. Post peel the study subjects were advised to use sunscreens and emollients. And general measures were advised like avoiding scrubbing or any form of friction during or after bathing and avoiding very hot water for bathing. Digital photographs were taken before treatment and at the final evaluation and assessed visually by the investigator.

The degree of improvement in pigmentation was evaluated using subjective global improvement scale.

Subjective global improvement scale:

Excellent for >75%
Good for 50-75%
Fair for 25-49%
Minimal for <25% reduction in pigmentation

Patient satisfaction was evaluated using the following scoring system:

0 = not satisfied 1 = satisfied 2 = extremely satisfied
Patients were evaluated at each session and two months after the last session for the occurrence of complications such as burning sensation, erythema, dyspigmentation (hyper/hypopigmentation), scarring, infection.

RESULTS:

All patients showed a cosmetic improvement and good tolerance to the procedures. In the photographic evaluation, three patients had an excellent improvement (more than 75% improvement) (Figure 2) and seven had a good improvement (50–75% improvement) (Figure 1). They also showed improvement on dermoscopy. All the patients reported they were very satisfied with the combination treatment and the results. No adverse events were reported.

At follow-up, at 8 weeks after the last peel, all ten patients had a maintained therapeutic response.



Figure 1 : Images taken at baseline and 2 months after completion of treatment showing 50% improvement



Figure 3: Dermoscopy before and after completion of treatment (hob and spoke pattern shown by yellow circles)



Figure 2 : Images taken at baseline and 2 months after

completion of treatment showing >75% improvement

DISCUSSION:

Virchow, in 1854, introduced the term "amyloid". He believed that the substance resembled starch or cellulose because, like starch, it turned blue when stained with iodine followed by dilute sulfuric acid.⁵ In dermatology, Gutmann first described amyloidosis in the skin and named it amyloidosis localis cutis nodularis et disseminata in 1927. Macular form of cutaneous amyloidosis was first described by Palitz and Peck in 1952.

In general, MA and LA occur more frequently in individuals with skin phototypes III and IV.⁶ Upper back was involved in 80% of patients and sun-exposed sites were involved in 64% cases.⁷ Most authors believe that localized trauma in the form of continuous friction, scratching or manipulation on taking bath or skin cleansing with the use of various gloves, sponges, brushes, plant stalks or leaves plays a role in the genesis of amyloid due to mechanical damage to keratinocytes or their apoptosis.⁸

Various treatment modalities for MA includes potent topical corticosteroids (under occlusion), topical calcineurin inhibitors, topical dimethyl sulfoxide (DMSO), PUVA, UVB phototherapy, systemic retinoids, low-dose cyclophosphamide, and cyclosporine. In addition, there are physical therapeutic options such as: electrodesiccation, dermabrasion, chemical peel and lasers.⁴

GA peels provide an aesthetic and therapeutic benefit to the skin with quick recovery time, are now practiced in various pigmentation.⁹

In study conducted by Vaghasia et al which included 75 patients, group A was treated with 15% TCA, group B with 35% glycolic acid peel, group C with Nd yag laser. The mean change in color score (1.68) was more by Group A, followed by Group C (1.4), followed by Group B (1.16). TCA showed better response compared to GA and Nd yag laser at the end of the treatment, both by subjective and objective methods.¹⁰ Another comparative study conducted by Sacchidananda et al showed similar results. TCA showed better response than glycolic acid peel.¹¹

Among laser pulsed dye laser, and frequency-doubled Q-switched Nd: YAG laser have been tried in treating cutaneous amyloidosis. Recently, fractional ablative 2,940 nm Erbium:YAG laser was tried for the treatment of lichen amyloidosis and showed considerable efficacy. The authors suggested trans-epidermal elimination as a probable mechanism of action.¹² Ablative fractional photothermolysis creates vertical channels that might assist the delivery of topically applied drugs into the skin.¹³

In a study conducted by Esmat et al, it was reported that fractional CO₂ laser provided measurable improvement in the clinical appearance and histological pattern, as well as in the associated itching of cutaneous amyloidosis. They applied the fractional CO₂ parameters in one of the two treatment modes. The first is the superficial ablation whereas the second is the rejuvenating mode.⁴ Another study by Sobhi et al showed that fractional CO₂ laser showed improvement in the clinical appearance and histological pattern. It was Comparative study where in Fractional CO₂ followed by topical steroid application showed better results than compared to Fractional CO₂ alone and Fractional CO₂ followed by Vitamic C application.¹⁴

In our study we used combination treatment of fractional CO₂ followed by glycolic acid peel (1 week after laser). 3 sitting of lasers monthly with 2 weekly glycolic acid peel in between lasers was done. This method was designed for better topical

delivery of peeling agent and also laser helps in trans epidermal elimination of pigments. 10 patient underwent this treatment for duration 5 months. 3 out of 10 patient showed 75% improvement in pigmentation. Dermoscopy also showed reduction in pigmentation. All patient were satisfied with the results. No side effects was reported.

Limitation:

Our study was designed to assess a combination, treatment this means that we cannot identify any one of the treatment components as having a stronger or weaker treatment effect. This series of cases could be extended in future studies to a greater number of cases and with a longer follow-up.

CONCLUSION:

Fractional CO₂ laser and glycolic acid peel combined treatment is suitable treatment option for macular amyloidosis. The combined treatment used here was well tolerated by patients, safe, and highly effective. This combination regimen for macular amyloidosis needs to be explored in future studies with greater patient numbers.

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