

A Novel and Safe Modality for Non-Surgical Hair Restoration using Polydioxanone Monofilament Threads

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Abstract: Introduction: Androgenetic alopecia (AGA) is the most common type of alopecia in men. The hunt for novel therapies for AGA continues, despite several treatment modalities. Polydioxanone (PDO) threads are synthetic absorbable non-allergenic material with high flexibility and retention strength. It acts by stimulating new vessel formation and connective tissue generation on the scalp. Objectives: To evaluate the efficacy & safety of scalp threads in men with AGA with unsatisfactory response to other standard treatments. Materials and Methods: The study was done on 10 male patients with AGA aged 18-45 years not responding to Minoxidil and oral Finasteride despite 15 months of treatment. Patients were treated with polydioxanone monofilaments. Efficacy was calculated using (A) Global photographic improvement (B) Trichoscopic Hair Count (C) Visual Analogue Scale. All data collected were analysed using spss22. Result: A patient satisfaction scale from 1 to 10 to assess hair growth, with 1 being the least satisfied and 10 being the most satisfied was provided. The average was found to be 7.2 and showed significant improvement in hair regrowth. Conclusion: The patient survey suggests therapeutic advantage, hence scalp threads can be used.

Keywords: Scalp threads, Androgenetic alopecia, Polydioxanone, Monofilament, Hair regrowth

1. Introduction

Androgenetic alopecia (AGA) is the most common type of alopecia in men. It has a genetic predisposition due to an increased response of hair follicles to androgens¹. It can lead to psychological disturbance and an increase in negative socioemotional events. The hunt for novel therapies for AGA continues, despite several available treatment modalities. Polydioxanone (PDO) monofilament threads are synthetic absorbable non-allergenic material with high flexibility and retention strength. They are used for non-surgical facelift procedures and have recently been used to promote hair growth. The exact mechanism is not known but it acts by causing a foreign body reaction, neocollagenesis, improves microcirculation, and regulates gene expressions on the scalp².

2. Literature Survey

The significance of this study lies in its potential to offer a new, nonsurgical option for patients with AGA who have not responded to conventional treatments. This method may provide an alternative with fewer side effects and better patient satisfaction, thus advancing the current treatment landscape for AGA.

3. Materials and Methods

The study is done on 10 male patients with AGA aged 18-45 years not responding to Minoxidil and oral Finasteride despite 15 months of treatment. Patients were selected randomly after relevant history was taken and contraindications were ruled

out. An informed consent was obtained after ensuring a 3-month wash-off period from previous therapies. Patients were treated with polydioxanone monofilament thread therapy under topical anaesthesia. By stretching the scalp with the non-dominant hand, multiple needles (20-40) with PDO threads (30 mm long) were inserted intradermally in the scalp at an interval of 2 cms in a radial fashion with the dominant hand followed by their withdrawal leaving the threads in situ. Oral antibiotics were given for 3 days and patients were advised to wash their hair gently after 48 hours. Efficacy was calculated by (A) Global photographic improvement (B) Trichoscopic Hair Count in a fixed 1cm² area (C) Patient satisfaction assessed by Visual Analogue Scale. All data collected were analysed using spss22.

4. Results

The average trichoscopy hair count in a fixed 1 cm² area was 28.90 before management and improved to 55.40 after 12 weeks of treatment. This represents an improvement of 47.83%, which was statistically significant with a p-value of <0.05. A patient satisfaction scale from 1 to 10 to assess hair growth, with 1 being the least satisfied and 10 being the most satisfied was provided. The average was found to be 7.2.

Table 1: Paired Sample Statistics for average Hair Follicle Units before and after management (12 weeks)

	Mean	N	Standard deviation	Standard error of mean
Before	28.90	10	9.69	3.06
After	55.40	10	15.12	4.78

5. Discussion

All the male patients (N=10) with androgenic alopecia were provided with polydioxanone monofilament thread therapy. (Figure 1) The efficacy & safety of PDO monofilament thread insertion into the scalp was evaluated. The average Trichoscopy Hair Count in a fixed 1cm² area was 28.90 before treatment and improved to 55.40 after 12 weeks of management. The improvement was found to be 47.83% (statistically significant with a P-value of <0.05). (Figure 2). Minimal side-effects such as pain and swelling were noted in two patients. A similar study conducted by Dhurat et.al³ also showed improvement in hair count with scalp threads compared to monotherapy with topical minoxidil. In conclusion, it was observed that PDO threads had better outcomes with minimal post-procedure side effects in the treatment of androgenic alopecia.



Figure 1: Insertion of the polydioxanone-loaded needles into the intradermal plane of the scalp



Figure 2: After 12 weeks of scalp threading

6. Conclusion

This study demonstrates that polydioxanone monofilament threads are an effective and safe option for the treatment of androgenic alopecia in men, showing significant improvements in hair count with minimal side effects. However, further research is needed to understand the underlying mechanisms and to optimize treatment protocols for wider clinical applications.

7. Future Scope

The usage of monofilament threads for hair regrowth is an evolving field and future developments are needed to improve the efficacy of the treatment.

References

- [1] Sasaki GH. Review of Human Hair Follicle Biology: 2019 Feb.
- [2] Jyotirmay Bharti et al Scalp threading with polydioxanone monofilament threads: a novel, effective

and safe modality for hair restoration, J Eur Acad Dermatol Venereol. 2017 Nov.

- [3] Dhurat R, Sukesh M, Avhad G, et al. A randomized evaluator blinded study of effect of microneedling in androgenic alopecia: a pilot study. Int J Trichology 2013.

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