Library Progress International
Vol.44, No.3, Jul-Dec 2024: P.316-322

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article *Available online at www.bpasjournals.com*

Androgenic Alopecia – Comprehensive Insights and Interdisciplinary Approaches to Diagnosis and Management: A Case Report

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How to cite this article: Nazia Khan, Ritik Kashwani , Rohit sharma, Sibani Sarangi, Sibani Sarangi, Kanika Nirankari (2024) Androgenic Alopecia – Comprehensive Insights and Interdisciplinary Approaches to Diagnosis and Management: A Case Report, 44(3), 316-322.

ABSTRACT
Androgenic alopecia (AGA) is a genetically predetermined condition influenced by the androgen hormone dihydrotestosterone (DHT). The condition presents with progressive hair thinning, often leading to baldness in specific patterns for both men and women. This case report presents a 35-year-old male patient who experienced sporadic patches of facial hair loss and scalp thinning. Comprehensive diagnostic approaches were employed, including a detailed medical history, physical examination, and scalp biopsy, which confirmed the diagnosis of AGA. The patient underwent follicular unit extraction (FUE) hair transplantation, with positive postoperative results observed over a four-month period. The report discusses current treatment options for AGA, including pharmacological interventions such as minoxidil and finasteride, as well as surgical and cosmetic solutions like hair transplantation and laser therapy. Recent advancements in gene therapy and stem cell research also offer promising avenues for more effective and lasting treatments for AGA.

Keywords : Androgenic Alopecia (AGA) , Dihydrotestosterone (DHT) , Follicular Unit Extraction (FUE) , Minoxidil , Stem Cell Therapy

INTRODUCTION

Alopecia denotes baldness, whereas areata refers to patches. The illness results in hair loss on the face, scalp, and occasionally other parts of the body including the legs or underarms [1].

Not only may hair loss be extremely distressing for the patient, but oral and maxillofacial surgeons and even primary care physicians find it challenging to diagnose and treat alopecia [2].

The term "cicatricial alopecias" (CA) refers to a group of subtypes of hair loss in which an unidentified inflammatory process destroys the hair follicle [3].Alopecia barbae is characterized by sporadic facial hair loss,

while alopecia ophiasis results in hair loss in a band or strip on the scalp. Alopecia totalis refers to the complete loss of scalp hair, whereas alopecia universalis involves the loss of all body hair, including the scalp, though this condition is rare [4].

Hormonal imbalance is the cause of androgenetic alopecia (AGA), the second most frequent kind of alopecia. The gonads generate the sex hormone dihydrotestosterone (DHT), also known as an androgenic hormone. Similar to testosterone, DHT binds to its target sites with ease and stays attached for 53 minutes as opposed to 35 minutes for testosterone. Hair shrinking brought on by an excess of DHT shortens the telogen phase and shortens the anagen phase, ultimately resulting in hair loss. Normally, the enzyme 5-alpha-reductase converts up to 10% of the testosterone in the body permanently into DHT. Another cause of hair loss may be insufficient blood flow to the scalp, which results in less oxygen and nutrients getting to the area [5]. For some men, androgenic alopecia is a significant concern, prompting them to seek treatment solutions. Unfortunately, the number of approved treatment options is relatively limited, with minoxidil and finasteride being two examples. Recent research indicates that finasteride can have serious, long-lasting side effects for some men, including depression, impotence, and an increased risk of suicide. Due to its higher potency as a 5α-reductase inhibitor, some experts recommend using dutasteride for treating androgenic alopecia. However, there is generally a lack of consensus on a method that considers both treatment efficacy and adverse effects, and no individually customized techniques have been proposed [6].

The first medication for the treatment of AGA that the FDA authorized was topical minoxidil. It comes in two forms: a 2% solution and a 5% foam. The 5% solution works better than the 2% solution [7]. Finasteride is a 5AR inhibitor that has FDA approval for androgenetic alopecia treatment. The medication functions by preventing type2 5AR from converting testosterone to DHT [8]. Hair transplantation is a frequently used treatment option for AGA, yet the efficacy of the procedure varies depending on the surgeon's skill and approach. Hair transplantationinvolves removing hair follicles from androgen-resistant scalp areas and transplanting them into androgen- dependent areas known as the recipient area or bald area. Visible results usually appear 6 to 9 months after the transplant, and medication like minoxidil may be needed to stop the condition from getting worse. Some cosmeticprocedures, such as platelets, Low laser light treatment (LLLT) and rich plasma (PRP) are also utilized [9].

CASE PRESENTATION

A 35-year-old male patient presented to our clinic with a chief complaint of progressive hair loss [Figure1] .The patient reported noticing sporadic patches of hair loss on his face over the past three months, which prompted his visit. Upon further inquiry, he mentioned no associated itching, redness, or pain in the affected areas.

To diagnose androgenic alopecia, a thorough approach is employed. Initially, a detailed medical and family history is reviewed to identify any hereditary patterns of hair loss. A physical examination of the hair and scalp is conducted to observe the typical patterns of thinning and baldness associated with androgenic alopecia.A scalp biopsy was performed to examine hair follicles under a microscope, confirming the diagnosis. Additionally, trichoscopy, a non-invasive technique using a specialized microscope could also be used to closely inspect the scalp. Blood tests are often carried out to rule out other potential causes of hair loss, such as hormonal imbalances. In certain situations, genetic testing may also be considered to identify genetic markers linked to androgenic alopecia. This comprehensive evaluation ensures an accurate diagnosis and helps in planning appropriate treatment options.

On physical examination, the patient exhibited no hair loss on the beard area . Additionally, there was no hair loss around the occipital region of his scalp , indicative of androgenic alopecia , The rest of the scalp showed no signs of hair loss, and his eyebrows, eyelashes, and body hair remained intact.

Using FUE techniques, a graft was taken from the donor site and transplanted to the recipient site [Figure 2 & 3]. During the procedure, intraoperative anesthesia was administered, with bupivacaine given to the patient. Graft transplanted to the recipient site can be seen in Figure 4.

Post Op images are shown in Figures 5, 6 and 7.

Figure 1 : Surgical area marking with surgical ink marker

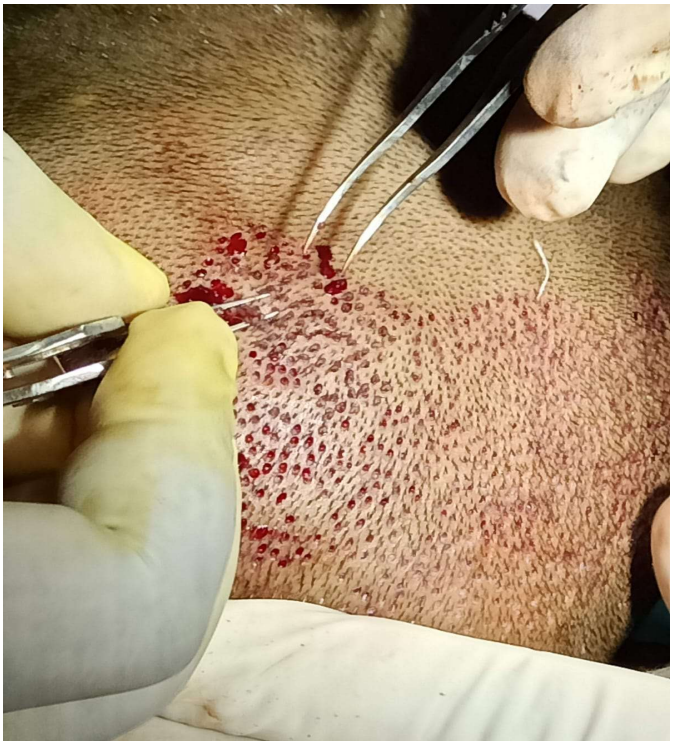

Figure 2 : Extraction of the Hair Follicle Graft

Figure 3 : Graft Taken From the Donor Site

Figure 4 : Graft placed at the recipient site

Figure 5 : Post OP Image of the Patient after 1 month

Figure 6 : Post OP Image of the Patient after 3 month

Figure 7 : Post OP Image of the Patient after 4 month

DISCUSSION

According to Shapiro et al. This condition, often referred to as male or female pattern baldness, is characterized by a progressive thinning of the hair, typically following a distinct pattern. In men, it often begins with a receding hairline and thinning at the crown, while in women, it usually manifests as a diffuse thinning over the crown with the frontal hairline generally preserved. Dr. Shapiro emphasizes that androgenic alopecia is a genetically predetermined disorder influenced by androgens, particularly dihydrotestosterone (DHT) [10,11].

According to Christiano etal. underscores the role of both maternal and paternal genetic contributions. Additionally, she explains that androgens, especially DHT, bind to androgen receptors in the scalp hair follicles, leading to miniaturization of these follicles and a reduction in hair growth [12]. J A Ellis discusses the psychological and social ramifications of androgenic alopecia. He points out that hair loss can significantly impact an individual's self-esteem and body image, leading to issues such as anxiety, depression, and social withdrawal [13].

Antonella Tosti etal., provides a comprehensive overview of the treatment options available for androgenic alopecia. She mentions that treatments can be broadly classified into pharmacological, surgical, and cosmetic approaches. Pharmacological treatments include topical minoxidil and oral finasteride, which have been shown to be effective in slowing hair loss and promoting regrowth in some individuals [14].

Rodney Sinclair etal., a leading researcher in hair biology, discusses future directions in the study and treatment of androgenic alopecia. He emphasizes the potential of gene therapy and stem cell research in developing more effective and lasting solutions.

CONCLUSION

This case report illustrates the successful use of follicular unit extraction (FUE) in treating androgenic alopecia (AGA) in a 35-year-old male patient with progressive hair loss. Diagnostic methods, including a detailed medical history, physical examination, and scalp biopsy, confirmed AGA, allowing for an appropriate treatment plan. The patient's positive response to FUE over a four-month period highlights the efficacy of hair transplantation in managing AGA. Additionally, the report underscores the importance of pharmacological options like minoxidil and finasteride, while also considering recent advancements in gene therapy and stem cell research, which hold promise for more effective and lasting treatments for AGA.

REFERENCES

1. https://www.naaf.org/alopecia-areata/

2. Goldberg LJ. Alopecia - New building blocks. J Am Acad Dermatol. 2023 Aug;89(2S):S1-S2. doi: 10.1016/j.jaad.2023.05.048. PMID: 37591559.
3. Poliner AD, Tosti A. Hair regrowth in cicatricial alopecia: A literature review. J Dermatol. 2021 Aug;48(8):1113-1128. doi: 10.1111/1346-8138.15902. Epub 2021 Apr 22. PMID: 33890315.
4. Freitas E, Guttman-Yassky E, *et al*. "Baricitinib for the treatment of alopecia areata." *Drugs*. 2023 Jun;83(9):761-70.
5. Dhariwala MY, Ravikumar P. An overview of herbal alternatives in androgenetic alopecia. J Cosmet Dermatol. 2019 Aug;18(4):966-975. doi: 10.1111/jocd.12930. Epub 2019 Apr 13. PMID: 30980598.
6. Motofei IG, Rowland DL, Baconi DL, Tampa M, Sârbu MI, Păunică S, Constantin VD, Bălălău C, Păunică I, Georgescu SR. Androgenetic alopecia; drug safety and therapeutic strategies. Expert Opin Drug Saf. 2018 Apr;17(4):407-412. doi: 10.1080/14740338.2018.1430765. Epub 2018 Jan 24. PMID: 29363345.
7. Najjar, Omar & Alkhars, Mohammed & Molhim, Saleh & AlAjmi, Mohammed & Alhafith, Abdullah & Najjar, Maryam & Almaqhawi, Abdullah. (2023). The Impact of Androgenic Alopecia on the Quality of Life of Male Individuals: A Cross-Sectional Study. Cureus. 15. 10.7759/cureus.47760.
8. Piraccini, Bianca & Blume-Peytavi, Ulrike & Scarci, Francesco & Jansat, Josep & Falqués, Meritxell & Otero, Raquel & Tamarit, Maria & Galván, Jordi & Tebbs, Veronica & Massana, Eric & Group, The. (2021). Efficacy and safety of topical finasteride spray solution for male androgenetic alopecia: a phase III, randomised, controlled clinical trial. Journal of the European Academy of Dermatology and Venereology. 36. 10.1111/jdv.17738.
9. Maletic, Ana & Dumic-Cule, Ivo & Zic, Rado & Milosevic, Milan. (2023). Impact of Hair Transplantation on Quality of Life. Aesthetic Plastic Surgery. 48. 10.1007/s00266-023-03781-6.
10. Shapiro, J. (2000). Clinical practice. Androgenetic alopecia in men. *New England Journal of Medicine*, 343(13), 964-971.
11. Shapiro, J., & Otberg, N. (2010). Hair loss: principles of diagnosis and management of alopecia. *CRC Press*.
12. Christiano, A. M., & Hordinsky, M. (2003). *Hair Growth and Disorders*. Springer
13. Tosti, A., & Piraccini, B. M. (2002). Finasteride and other treatments of androgenetic alopecia in men and women. *Journal of Investigative Dermatology Symposium Proceedings*, 7(1), 51-55.
14. Sinclair, R. (2013). Male pattern androgenetic alopecia. *BMJ Clinical Evidence*, 2013