



Abstract

and quality of life. Over the years, hair transplantation has emerged as a viable solution for those seeking to restore their natural hairline and achieve a fuller head of hair. This review article aims to provide a comprehensive overview of the advancements in hair transplantation techniques, focusing on both surgical and non-surgical approaches. We discuss the history of hair transplantation, the evolution of techniques, current state-of-the-art procedures, and potential future

Key word : Hair transplantation, Hair restoration; Alopecia; Follicular unit transplantation (FUT)

Introduction

Hair loss, or alopecia, is a common cosmetic concern that affects individuals of all ages and genders. While it is a natural part of the aging process, many people find it distressing and seek ways to regain their hair and confidence. Hair transplantation has emerged as a highly effective solution, offering both surgical and non-surgical options for hair restoration. This review article will delve into the history, evolution, and current state of hair transplantation techniques, shedding light on the latest advancements in the field [1, 2]. Hair transplantation has evolved significantly over the years, transforming from a rudimentary procedure to a sophisticated and highly effective solution for hair loss. This comprehensive review explores the latest advancements in hair transplantation techniques, shedding light on the innovative approaches that have revolutionized the field. Historically, hair restoration procedures primarily involved the transplantation of hair follicles from one area of the scalp to another. While this basic concept remains, recent years have witnessed a surge in technological and procedural enhancements that have elevated the outcomes and patient experience. One noteworthy advancement is the refinement of Follicular Unit Transplantation (FUT) and Follicular Unit Extraction (FUE) techniques. FUT involves the removal of a strip of hair-bearing skin, from which individual follicular units are extracted and transplanted. In contrast, FUE is a minimally invasive technique where individual follicular units are directly harvested from the donor area. The advent of robotics in FUE procedures has further improved precision and reduced recovery times. Another pivotal breakthrough is the utilization of platelet-rich plasma (PRP) in conjunction with hair transplantation [3-5]. PRP, derived from the patient's own blood, is rich in growth factors that stimulate hair follicle activity and enhance graft survival. This adjunctive therapy has demonstrated promising results in promoting faster healing and improved hair regrowth. Beyond traditional scalp transplantation, advancements have expanded the scope to include body hair transplantation and facial hair restoration.

these breakthroughs and more, offering a nuanced understanding of the contemporary landscape of hair transplantation [6-8]. As technology continues to advance and scientific research progresses, the future of hair transplantation holds exciting possibilities, promising even more effective and personalized solutions for individuals seeking to restore their natural hairline and confidence.

Material and Method

Historical perspective

Early Attempts The first recorded hair transplant dates back to 1822, when a German surgeon attempted to transplant hair from one area of the body to another. Early techniques involved grafting small skin flaps with hair follicles from one area to another, often resulting in poor outcomes.

Modern era

Dr. Norman Orentreich's pioneering work in the 1950s laid the foundation for modern hair transplantation. Orentreich's concept of "donor dominance" revolutionized the field and led to the development of the punch graft technique.

Evolution of hair transplantation techniques

Punch Grafts Description of punch grafts and their limitations. Introduction of mini and micrografts to improve naturalness.

Follicular unit transplantation (FUT)

Explanation of FUT, including strip harvesting and suturing methods. Advantages and disadvantages of FUT. Follicular Unit Extraction Overview of FUE as a minimally invasive technique. Robotic-assisted FUE and its benefits. Current State-of-the-Art Hair Transplantation Techniques Robotic Hair Transplantation In-depth

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