

Advancements in Hair Transplantation Techniques: A Comprehensive Review

Zhao C*

Department of transplantation, Tohoku University Hospital, Sendai, Norway

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In recent years, the field of hair transplantation has undergone a remarkable transformation, propelled by innovative techniques and technological advancements. As a prevalent solution for individuals grappling with hair loss, the evolution of hair transplant procedures has not only restored hair but has also significantly enhanced the naturalness and aesthetic appeal of the outcomes [1]. This comprehensive review aims to elucidate the recent advancements in hair transplantation techniques, providing an in-depth exploration of the state-of-the-art procedures that have redefined the landscape of hair restoration. Historically rooted in methods such as strip harvesting, hair transplantation has evolved dramatically with the advent of follicular unit transplantation (FUT) and follicular unit extraction (FUE) [2,3]. These techniques, characterized by their precision in graft harvesting, have become the gold standard, demonstrating superior results and minimizing scarring. Beyond these foundational approaches, the review delves into the revolutionary realm of robotic-assisted hair transplantation, where automation has brought unprecedented accuracy and efficiency to the extraction and transplantation process. Moreover, the integration of platelet-rich plasma (PRP) therapy has emerged as a complementary strategy to optimize graft survival and stimulate the growth of transplanted hair follicles [4,5]. As the interdisciplinary collaboration between dermatologists and plastic surgeons becomes increasingly pivotal, the review emphasizes the holistic nature of contemporary hair transplant procedures, addressing not only the surgical techniques but also the crucial aspects of patient selection, preoperative evaluation, and postoperative care [6,7]. This exploration of advancements in hair transplantation serves as a vital resource for practitioners and researchers alike, offering a nuanced understanding of the evolving techniques that contribute to the

continual enhancement of patient outcomes and satisfaction in the dynamic field of hair restoration [8].

The material and methods employed in this comprehensive review aimed to systematically analyze and synthesize the advancements in hair transplantation techniques. A thorough literature review was conducted, encompassing peer-reviewed articles, clinical studies, and scientific publications from reputable databases. The search strategy involved inclusion criteria were defined to select studies and reports focusing on recent innovations in hair transplant procedures, with an emphasis on advancements in FUT, FUE, robotic-assisted techniques, and the integration of PRP therapy [9,10]. Relevant studies covering patient outcomes, procedural efficiency, and advancements in technology

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