

Cosmetic Dermatology

From Basic Principles to Practice

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ISBN	Publishing Coordinator
978-625-362-229-9	Yasin DİLMEN
Book Title	Page and Cover Design
Cosmetic Dermatology From Basic Principles to Practice	Typesetting and Cover Design by Akademisyen
Author	Publisher Certificate Number
Seda NISANCI GOKSUN Assist. Prof., Kırklareli University Faculty of Medicine, Department of Dermatology and Venereology, sdnisanca@gmail.com, ORCID iD: 0000-0003-0557-556X	47518
	Printing and Binding
	Vadi Printingpress
	Bisac Code
	MED017000
	DOI
	10.37609/akya.4344

Library ID Card

Nışancı Göksun, Seda.

Cosmetic Dermatology From Basic Principles to Practice / Seda Nışancı Göksun.

Ankara : Akademisyen Yayınevi Kitabevi, 2026.

174 p. ; 160x235 mm.

Includes References and Index.

ISBN 9786253622299

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PREFACE

Over the past two decades, cosmetic dermatology has become one of the most rapidly developing and most interdisciplinary fields within dermatology. As our understanding of the molecular mechanisms of skin aging has grown, a broad therapeutic spectrum extending from topical agents to injectables, and from chemical peels to energy-based devices, has become part of daily practice. This rapid expansion has also brought with it an increase in procedures of debatable evidence level and in preventable complications.

This book aims to address cosmetic dermatology practice within an evidence-based framework, starting from its fundamental biological basis. Across thirteen chapters, the pathophysiology of skin aging, patient assessment and skin type classifications, topical antiaging agents, photoprotection, chemical peeling and mechanical exfoliation, botulinum toxin and filler procedures, mesotherapy and platelet-rich plasma, lasers and energy-based devices, acne scarring, pigmentary disorders, hair-related procedures, and ethics, safety and complication management are examined in the light of the current literature.

Two principles guided the preparation of this book. The first was to give priority to current systematic reviews, meta-analyses and consensus statements under each heading, with the level of evidence clearly stated; the second was to provide recommendations on patient selection, technique and complication management that can be applied directly in clinical practice.

I hope this book proves useful to dermatology residents, to specialists working in the field, and to colleagues with an interest in cosmetic dermatology practice.

Assist. Prof. Seda NİŞANCI GÖKSUN, MD

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Chapter 1

PATHOPHYSIOLOGY OF SKIN AGING: INTRINSIC AND EXTRINSIC FACTORS

Abstract

Skin aging is a multifactorial process resulting from the interaction between genetically determined intrinsic aging and cumulative environmental damage. Intrinsic aging is characterized by cellular senescence, telomere shortening, oxidative stress, hormonal alterations, reduced cellular proliferation, and progressive loss of extracellular matrix integrity. Extrinsic aging is driven predominantly by ultraviolet radiation, with additional contributions from smoking and air pollution. UV-induced reactive oxygen species activate matrix metalloproteinases and suppress TGF- β /Smad signaling, resulting in collagen degradation and impaired collagen synthesis. Clinically, these mechanisms manifest as wrinkles, loss of elasticity, dryness, pigmentary irregularities, and tissue laxity. Understanding the molecular mechanisms underlying both intrinsic and extrinsic aging provides the biological foundation for rational selection of preventive and therapeutic strategies in cosmetic dermatology.

Keywords: skin aging, intrinsic aging, photoaging, matrix metalloproteinases, cellular senescence

1.1. Introduction

The skin is the largest organ of the human body and is a dynamic, complex structure that is continuously exposed to internal and external influences. Aging may be regarded as the sum of the irreversible changes that occur over time in the structure and function of the skin. In clinical practice, cosmetic dermatology aims to elucidate the processes underlying aging and thereby to implement both preventive and therapeutic approaches.

Skin aging is essentially considered under two categories: intrinsic (chronological/natural) aging and extrinsic (environmental/exogenous) aging (1). However, the current literature emphasizes that these two processes cannot

1.5. Clinical Manifestations

The cumulative effects of intrinsic and extrinsic aging processes present on clinical examination with a wide range of findings, from fine wrinkles to deep furrows and from uneven skin tone to marked laxity. Accurate analysis of the processes underlying this clinical picture (collagen/elastin loss, extracellular matrix deterioration, cellular senescence and glandular functional decline) is decisive in ensuring that the topical treatments, chemical peels, energy-based devices and injectable procedures discussed in the following sections are selected on a rational basis.

1.6. Conclusion

Skin aging, founded on mechanisms such as cellular senescence, oxidative stress, hormonal changes and matrix metalloproteinase-mediated collagen degradation, is a biological state arising from the interaction of genetically encoded intrinsic processes with extrinsic damage caused by environmental factors, principally solar radiation. The rational basis of all treatment approaches in cosmetic dermatology, both invasive and non-invasive, rests on a correct understanding of these complex pathophysiological processes.

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Chapter 2

PATIENT ASSESSMENT AND SKIN TYPES IN COSMETIC DERMATOLOGY

Abstract

Successful cosmetic dermatologic treatment begins with comprehensive patient assessment rather than procedural technique alone. Evaluation should include detailed medical and aesthetic history, analysis of expectations, psychosocial screening, systematic physical examination, standardized clinical photography, and identification of relevant contraindications. Particular attention should be paid to unrealistic expectations and features suggestive of body dysmorphic disorder. Skin classification systems, including the Fitzpatrick phototype, Glogau photoaging classification, and Baumann Skin Type Indicator, provide useful frameworks for treatment planning, although each has important limitations and should be interpreted alongside clinical examination. Informed consent represents an ongoing communication process rather than merely a signed document. Careful patient selection and individualized risk assessment are essential for maximizing treatment efficacy, reducing complications, and maintaining an ethical physician–patient relationship.

Keywords: patient assessment, skin type, Fitzpatrick classification, informed consent, body dysmorphic disorder

2.1. Introduction

The clinical success sought in cosmetic dermatology depends not only on the technically correct performance of the chosen treatment method, but also on the systematic patient assessment carried out beforehand. Individuals presenting for aesthetic purposes usually attend the clinic not because of a disease but with a personal expectation of improving their appearance; this makes both the nature of the physician-patient relationship and the scope of the assessment process different from those of a general dermatological consultation. Appropriate patient selection, establishment of realistic expectations, advance identification

Table 2.3. Abstract of general contraindications by procedure group (details are addressed in the relevant chapters)

Procedure Group	Principal Absolute/Relative Contraindications
Botulinum toxin	Neuromuscular junction disorders, pregnancy/lactation, active infection at the injection site, aminoglycoside use (relative)
Fillers	Active infection/inflammation, severe autoimmune disease, known hypersensitivity, history of granuloma at the filler site
Chemical peeling	Active dermatitis or infection and keloid tendency (particularly for deep peels) constitute absolute contraindications. Systemic isotretinoin use is not in itself an absolute contraindication to superficial peels, but requires careful clinical evaluation for deep peeling procedures.
Laser/IPL	Use of photosensitizing drugs, active sunburn, aggressive parameters in dark phototypes, pregnancy (relative)
Microneedling/PRP	Active skin infection, coagulopathy, keloid tendency, active acne (localized)

2.8. Conclusion

Patient assessment in cosmetic dermatology requires a multidimensional approach that brings together a detailed clinical and aesthetic history, systematic physical examination, standardized photography, psychosocial evaluation, application of validated skin type classification systems and a comprehensive informed consent process. Although the Fitzpatrick, Glogau and Baumann classification models provide an objective basis for treatment planning, it is essential that their limitations be borne in mind and that the process be conducted in conjunction with the physician's individual clinical experience. Safe and effective application of the specific treatment methods addressed in detail in the following chapters depends on the meticulous conduct of the assessment process described here.

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Chapter 3

TOPICAL ANTIAGING AGENTS

Abstract

Topical therapy remains a cornerstone of antiaging management despite the increasing availability of procedural interventions. Photoprotection forms the foundation of every antiaging regimen, while topical retinoids—particularly tretinoin—have the strongest clinical evidence for improving photoaging and wrinkles. Vitamin C provides complementary antioxidant, collagen-supporting, and depigmenting effects, although formulation stability and skin penetration substantially influence efficacy. Peptides and growth factors may improve skin texture and extracellular matrix function but are supported by more limited clinical evidence. Emerging biological approaches, particularly exosomes and extracellular vesicles, are mechanistically promising but remain limited by inadequate standardization, heterogeneous evidence, and regulatory uncertainty. Effective topical antiaging strategies should combine photoprotection, antioxidant defense, stimulation of dermal repair, and maintenance of epidermal barrier function while considering formulation quality and patient tolerability.

Keywords: retinoids, vitamin C, peptides, growth factors, exosomes, antiaging

3.1. Introduction

Despite the rapid advance of interventional methods in medical aesthetics and cosmetic dermatology practice (energy-based devices, fillers, botulinum toxin and thread lifts), topical agents continue to be the cornerstone of antiaging treatment today. Three main reasons underlie this. First, topical treatments are suited to daily and long-term use and therefore match the continuous, ongoing nature of the aging process. Second, the durability of results obtained from aesthetic and interventional procedures depends largely on the success of the topical regimen applied before and after these interventions. Third, the risk-benefit balance of topical agents selected on the basis of accurate skin analysis is highly favorable in terms of clinical outcomes.

C and niacinamide; modest and heterogeneous evidence for peptides; early-stage and largely uncontrolled evidence for growth factors; and promising but as yet unstandardized evidence for exosomes.

3.12. Conclusion

Topical antiaging agents are complementary tools directed at different steps in the molecular pathogenesis of skin aging. The current literature indicates a clear hierarchy among them: photoprotection ranks first without dispute; tretinoin and other retinoids are the active molecules with the strongest evidence for reversing wrinkling and the signs of photoaging; vitamin C, in its dual role as antioxidant and as a cofactor supporting collagen synthesis, is the natural complement to this backbone. Peptides and growth factors should be positioned as well-tolerated supportive agents with more modest effect sizes. Exosomes and extracellular vesicles are mechanistically the most exciting group but the least mature in terms of standardization and regulation.

For the clinician, the real skill lies not in recommending the newest molecule but in constructing a sustainable and simple routine composed of agents with a high level of evidence, taking into account the patient's skin type, tolerability, expectations and capacity for adherence. Although senotherapeutics, microbiome modulators and targeted delivery systems are expected to be added to this routine in the coming years, these agents will need to be evaluated by the same criteria: penetration, concentration, controlled clinical evidence and safety.

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Chapter 4

SUN PROTECTION AND PHOTOAGING

Abstract

Photoaging results primarily from chronic solar exposure and involves oxidative stress, DNA damage, matrix metalloproteinase activation, extracellular matrix degradation, and cellular senescence. Although ultraviolet radiation remains the principal contributor, visible light and other environmental exposures are increasingly recognized as clinically relevant components of the skin exposome. Broad-spectrum sunscreen used regularly and in adequate amounts remains the cornerstone of prevention. In patients susceptible to pigmentary disorders, protection against visible light may provide additional benefit. Antioxidants, DNA repair strategies, and selected systemic photoprotective agents may complement conventional sunscreen but should not replace it. Modern photoprotection therefore extends beyond SPF values toward individualized, broad-spectrum strategies adapted to phototype, pigmentation tendency, lifestyle, and environmental exposure. Ultimately, long-term adherence to photoprotective behavior is more important than the theoretical superiority of any individual formulation.

Keywords: photoprotection, photoaging, ultraviolet radiation, sunscreen, visible light, oxidative stress

4.1. Introduction

Skin aging is the resultant of a genetically programmed intrinsic process and an extrinsic process driven by environmental factors. The dominant determinant of extrinsic aging is solar radiation, and the term photoaging describes this cumulative damage, which produces an appearance in sun-exposed areas beyond that expected for chronological age. Clinically it manifests with fine and deep wrinkles, elastosis, irregular pigmentation, telangiectasias, volume loss and hyperkeratosis; the severity and distribution of these findings vary markedly by phototype (1).

wearable sensors measuring UV in real time, and artificial intelligence-supported consumer applications (11,24).

4.8. Implications for Clinical Practice

- Photoprotection should be positioned as the first step of every antiaging protocol and maintained without interruption in patients undergoing retinoid therapy, energy-based device procedures or chemical peeling.
- In product selection, broad-spectrum coverage, the quantity applied and cosmetic acceptability that allows the patient to sustain daily use are more decisive than the SPF value.
- In patients with melasma, postinflammatory hyperpigmentation and dark phototypes, tinted products containing iron oxide should be preferred.
- In high-risk individuals (actinic damage, immunosuppression, history of skin cancer), formulations containing antioxidants and DNA repair enzymes together with systemic agents may be considered as complementary measures.
- Patients should be told that reapplication and the use of clothing and shade are as important as sunscreen itself.

4.9. Conclusion

Photoaging is a preventable process arising from the combination of ROS-mediated signal activation, MMP-driven matrix degradation, DNA damage and cellular senescence. The literature of recent years shows that the responsible spectrum extends beyond UV and that protection must correspondingly become multi-component. While correct and regular use of broad-spectrum filters in adequate quantity remains the cornerstone, pigmentary protection against visible light, antioxidants, DNA repair enzymes and, in selected cases, systemic agents complement this foundation. Regulatory developments such as the approval of bemotrizinol indicate that both the quality of protection and cosmetic acceptability will improve in the coming years. What is truly decisive in cosmetic dermatology practice, however, is not the most advanced formulation but the photoprotective behavior the patient can sustain over the long term.

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Chapter 5

CHEMICAL PEELING AGENTS, MICRODERMABRASION AND MECHANICAL EXFOLIATION

Abstract

Chemical peeling and mechanical exfoliation remain valuable, accessible, and scalable procedures in cosmetic dermatology. Their efficacy and safety depend not only on the selected agent but also on controlled treatment depth, appropriate patient selection, pre-procedure priming, and careful post-procedure care. Different peeling agents provide distinct clinical advantages: glycolic acid is widely used for pigmentary disorders, salicylic acid is particularly useful in acne-prone skin, and trichloroacetic acid can provide greater remodeling at medium depths. Mechanical techniques such as microdermabrasion primarily produce superficial epidermal effects and generally have a favorable safety profile. Postinflammatory hyperpigmentation remains an important consideration, particularly in darker phototypes. Contemporary practice increasingly favors individualized and combination protocols that integrate exfoliation with anti-inflammatory and pigment-modulating strategies while minimizing unnecessary procedural aggressiveness.

Keywords: chemical peeling, glycolic acid, salicylic acid, trichloroacetic acid, microdermabrasion, exfoliation

5.1. Introduction

Chemical peeling is a method in which a chemical agent applied to the skin in a controlled manner destroys the epidermis and, where required, part of the dermis, with the aim of producing a more regular epidermis and a remodeled dermal matrix during the subsequent repair process. Mechanical exfoliation achieves the same goal by physical rather than chemical means, using abrasive particles, diamond tips, rotating burrs or a scalpel. Both approaches are among the most frequently performed minimally invasive procedures in cosmetic dermatology

5.10. Combination Protocols and Practical Recommendations

- Superficial peels and microdermabrasion should be applied not as single sessions but in series (generally 4-6 sessions at 2-4 week intervals) and supported by topical home care.
- In melasma, peeling should be planned not as an independent treatment but as an accelerating component added to depigmenting therapy and photoprotection.
- In phototype IV-VI patients, treatment should begin at low concentration, priming should be applied and session intervals kept long.
- Combining more than one exfoliative method in the same session (for example microdermabrasion plus a medium-depth peel) should be avoided, as it may lead to an unpredictable increase in depth.
- Deep peeling should be performed only where appropriate monitoring facilities, experience and emergency response infrastructure are available.
- Broad-spectrum sunscreen use is mandatory after all exfoliative procedures; otherwise the risk of PIH increases markedly.

5.11. Conclusion

Chemical peeling and mechanical exfoliation retain their place in cosmetic dermatology because they are low in cost and scalable. The common message of the current literature is that efficacy is determined less by the choice of agent than by depth control, patient selection and priming. Glycolic acid stands out in melasma, salicylic acid in active acne, medium-depth TCA in photoaging and low-concentration phenol-croton oil formulations in advanced photoaging; by contrast, the effect of superficial methods such as microdermabrasion and hydrodermabrasion remains largely confined to the epidermal level. In the period ahead, combination formulations uniting exfoliative action with melanogenesis inhibition and anti-inflammatory effect are expected to widen the safety margin, particularly in dark phototypes.

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Chapter 6

BOTULINUM TOXIN PROCEDURES

Abstract

Botulinum toxin is among the most extensively studied and widely performed minimally invasive procedures in cosmetic dermatology. Its clinical role has expanded from correction of dynamic facial wrinkles to facial contouring, treatment of hyperhidrosis, scar modulation, and intradermal techniques aimed at improving skin quality. Contemporary treatment philosophy emphasizes selective modulation rather than complete muscular paralysis, preserving natural facial expression and maintaining functional balance between opposing muscle groups. Successful treatment requires detailed understanding of dynamic facial anatomy, individualized dose selection, and knowledge of differences among available preparations. Although botulinum toxin has a favorable safety profile, complications such as asymmetry, brow or eyelid ptosis, and unwanted functional effects require appropriate prevention and management. Long-term treatment also raises considerations regarding cumulative exposure, immunogenicity, and secondary non-response.

Keywords: botulinum toxin, dynamic wrinkles, facial anatomy, intradermal botulinum toxin, ptosis, immunogenicity

6.1. Introduction

The cosmetic use of botulinum toxin began in the early 1990s with the recognition of improvement in glabellar lines observed during treatment of blepharospasm (1). Over more than thirty years the toxin has been transformed from a lethal neurotoxin into a versatile therapeutic agent, extending in cosmetic dermatology beyond the treatment of dynamic wrinkles to a broad range of applications including facial contouring, hyperhidrosis, scar prophylaxis and improvement of skin quality (2).

This expansion has been supported by two developments. The first is a better understanding of the three-dimensional anatomy of the facial mimetic muscles

- Toxin alone is insufficient for static lines; combination treatment should be planned and expectations managed accordingly.
- Because the dose margin is narrow in lower face and neck applications, high doses should not be attempted before experience is gained.
- Injection intervals should not be shorter than three months, and cumulative dose should be limited as far as possible.
- Photographic records taken before and after the procedure at standard angle and lighting are essential both for outcome assessment and for the management of claims of asymmetry.

6.12. Conclusion

Botulinum toxin continues to be one of the interventional methods with the best-documented efficacy and safety profile in cosmetic dermatology. The current trend in the field is away from maximal muscular paralysis toward balanced, selective weakening that preserves natural expression, and away from a single indication toward combination treatment and intradermal techniques targeting skin quality. While long-acting and ready-to-use liquid formulations increase patient comfort, the initiation of treatment at an early age makes the management of immunogenicity and cumulative dose the key clinical question of the coming period. It should be remembered that the variable determining outcome quality is not the product but anatomical knowledge and dose discipline.

Keywords: botulinum toxin, dynamic wrinkles, hyperhidrosis, mimetic muscles, unit equivalence

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Chapter 7

FILLERS: HYALURONIC ACID AND OTHERS

Abstract

Modern filler treatment has evolved from direct wrinkle filling toward three-dimensional structural restoration based on the anatomical changes of facial aging. Hyaluronic acid remains the most widely used filler material because of its versatility, reversibility, and favorable safety profile, while calcium hydroxyapatite, poly-L-lactic acid, and other biostimulatory products have expanded the therapeutic focus toward collagen stimulation and tissue quality. Product selection should increasingly be guided by rheological and physicochemical properties rather than commercial categories alone. Although fillers can provide predictable aesthetic improvement, vascular occlusion and other serious complications require detailed anatomical knowledge, appropriate injection technique, and immediate access to standardized emergency protocols. High-frequency ultrasound is emerging as an important tool for anatomical assessment and complication management. Safe filler practice therefore integrates anatomy, product science, individualized treatment planning, imaging when appropriate, and comprehensive complication preparedness.

Keywords: dermal fillers, hyaluronic acid, biostimulators, rheology, vascular occlusion, ultrasound

7.1. Introduction

The use of soft tissue fillers in the treatment of facial aging has undergone a defining transformation over the past two decades. Whereas the initial approach was two-dimensional, aimed at filling wrinkle lines directly, practice today has evolved toward a logic of structural reconstruction targeting the multilayered components of aging, such as bone resorption, atrophy and displacement of fat compartments, weakening of the retaining ligaments and loss of dermal extracellular matrix. According to the 2024 data of the International Society of Aesthetic Plastic Surgery (ISAPS), hyaluronic acid injections are the second

Screening for body dysmorphic disorder is a component of aesthetic practice that should not be overlooked. Unrealistic expectations, requests for procedures repeated at short intervals and a history of dissatisfaction with every previous treatment are warning signs. During the informed consent process, the patient should be told the type of product, its expected duration, possible complications, and the fact that for non-HA fillers there is no rapid and reliable specific reversal agent comparable to hyaluronidase and that complication management may therefore be more difficult. Standardized photography should be adopted as a mandatory practice both for clinical follow-up and for documentation in the event of a dispute.

7.9. Conclusion

The field of fillers has advanced in three clear directions over the past three years. The first is the shift of product selection away from commercial classifications toward measurable rheological and physicochemical parameters; this approach converts product-to-site matching from a subjective preference into a scientific decision. The second is the replacement of volume-focused thinking by a holistic approach targeting tissue quality and the regenerative response; collagen biostimulators and injectable biorevitalizers are the concrete instruments of this transformation. The third is the transformation of safety from a domain of individual experience into a discipline founded on standardized protocols, emergency preparedness and imaging guidance.

It should nevertheless be borne in mind that a substantial part of the literature consists of industry-supported studies with short follow-up and heterogeneous protocols, and that standardized comparative randomized trials remain insufficient, particularly for biostimulators and polynucleotides. The fundamental principle in clinical practice is unchanged: to deliver the right product to the right patient in the right anatomical plane at the minimum necessary volume, and to be equipped to intervene without delay should a complication develop.

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Chapter 8

MESOTHERAPY AND PLATELET-RICH PLASMA (PRP)

Abstract

Mesotherapy and platelet-rich plasma represent two major injectable biostimulation approaches used to improve skin and hair quality. Mesotherapy involves intradermal administration of exogenous bioactive substances, whereas PRP utilizes an autologous platelet concentrate containing multiple growth factors and signaling molecules. Current evidence is strongest for PRP in androgenetic alopecia and as an adjunctive treatment for atrophic acne scars, particularly when combined with microneedling. Mesotherapy may provide benefits in skin biorevitalization and selected pigmentary indications, including protocols containing tranexamic acid, although heterogeneity in formulations limits standardization and comparison between studies. For facial rejuvenation, clinical improvements are generally modest and evidence remains variable. Both procedures have favorable safety profiles when performed using appropriate indications, sterile technique, standardized preparation methods, and careful patient selection.

Keywords: mesotherapy, platelet-rich plasma, PRP, biostimulation, skin rejuvenation, androgenetic alopecia

8.1. Introduction

Patient expectations in aesthetic dermatology practice have changed markedly over the past decade. As much as, and often more than, correction of wrinkles or replacement of lost volume, the radiance, moisture content, pore appearance, elasticity and overall texture of the skin have come to the fore. The definition of “skin quality” as an independent treatment goal has brought with it the rapid spread of injectable biostimulation methods based on delivering bioactive substances directly into the dermis (1).

The heterogeneity of protocols in the literature is, however, the most important factor limiting the strength of the available evidence. The physician's responsibility is to define clearly the product and protocol used, to inform the patient realistically, and to monitor outcomes by objective methods.

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Chapter 9

LASERS AND ENERGY-BASED DEVICES

Abstract

Lasers and energy-based devices induce controlled tissue injury or stimulation to generate therapeutic remodeling and represent a major component of modern cosmetic dermatology. Technological developments have increasingly focused on fractional energy delivery, shorter pulse durations, reduced downtime, and safer treatment of darker phototypes. Laser and light-based systems can target vascular, pigmentary, textural, and hair-related indications, whereas radiofrequency and ultrasound offer melanin-independent alternatives for dermal remodeling and tissue tightening. Current evidence supports clinically meaningful benefits from IPL and pulsed-dye laser in vascular disorders such as rosacea, fractional lasers in scar remodeling and photoaging, radiofrequency microneedling in acne scars and laxity, and microfocused ultrasound in selected tightening indications. Appropriate device selection requires matching wavelength, energy characteristics, tissue target, phototype, and clinical indication while maintaining rigorous attention to safety.

Keywords: laser, IPL, radiofrequency, ultrasound, fractional laser, energy-based devices

9.1. Introduction

In cosmetic dermatology practice, lasers and energy-based devices (EBDs) constitute the second major treatment arm alongside injectable procedures. Whereas injectable methods add substance to the dermis, energy-based devices trigger a biological repair response by delivering controlled physical energy to the tissue. This fundamental difference is why the two groups complement rather than exclude one another.

Over the past decade the field has advanced along three axes: shortening of healing time through fractionation of energy; shifting from photothermal damage to photomechanical effect by shortening pulse durations; and broadening access

- Phototype and history: Fitzpatrick phototype, tanning status, history of herpes, keloid tendency, use of photosensitizing drugs and pregnancy should be enquired about before every session.
- Test spot: In dark phototypes and in laser/IPL treatments carrying a high risk of pigmentary complications, the use of a test spot may be considered in order to determine appropriate parameters.
- Documentation: Photography at standardized lighting and angle; the device used, wavelength, fluence, pulse duration, spot size and number of passes should be recorded at every session.
- Managing expectations: The effect of non-ablative and energy-based tightening methods is modest and generally emerges gradually over three months; results comparable to a surgical lift should not be promised.
- Eye safety: Protective eyewear appropriate to the wavelength is mandatory for the patient and the entire team; this is the one item whose neglect can cause irreversible damage.

9.9. Conclusion

Lasers and energy-based devices are the treatment group with the widest range of indications in cosmetic dermatology. Current evidence supports significant clinical benefit from IPL and PDL in rosacea, from early fractional CO₂ laser in surgical and hypertrophic scars, from laser-based combinations in atrophic acne scarring, and from RFMN and MFU-V in skin laxity. The development of energy sources independent of melanin has markedly broadened access for patients with dark phototypes.

The most important weakness of the field, however, is the heterogeneity of devices and parameters. A substantial proportion of publications report wavelength, fluence, pulse duration and number of passes incompletely, which produces high heterogeneity in meta-analyses. Wider adoption of expert consensus documents and standardized reporting of parameters are the most critical steps toward raising the level of evidence in the period ahead. The physician's responsibility is to decide according to the patient's problem and skin phototype, not according to the promise of the device.

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Chapter 10

ACNE SCARRING AND TREATMENT APPROACHES

Abstract

Acne scarring represents a permanent and psychologically significant consequence of acne vulgaris and requires individualized treatment based on scar morphology, skin phototype, downtime tolerance, and patient expectations. Contemporary management has shifted from single-modality treatment toward combination strategies targeting different scar components. Techniques include subcision, chemical reconstruction, microneedling, fractional lasers, radiofrequency microneedling, fillers, and regenerative or biostimulatory approaches. Comparative evidence increasingly allows procedural selection according to the balance between efficacy, downtime, and risk of pigmentary complications, particularly in darker phototypes. Emerging approaches involving collagen biostimulators, polynucleotides, and exosome-based products are under investigation, although the quality of evidence varies. Importantly, early and effective treatment of active inflammatory acne remains the most effective strategy for preventing permanent scarring and should be considered an integral component of scar management.

Keywords: acne scars, subcision, fractional laser, radiofrequency microneedling, TCA CROSS, combination therapy

10.1. Introduction

Acne vulgaris, a chronic inflammatory disease of the pilosebaceous unit, is one of the most common dermatological conditions worldwide and affects almost the entire adolescent population at some point. Although in most cases the disease itself follows a self-limiting course, the permanent tissue damage it leaves behind may persist for life. Acne scarring is the most frequently encountered and most difficult to treat sequela of the disease; even when active lesions resolve completely, scar tissue does not improve spontaneously and softens only to a limited extent over the years.

multicenter randomized trials with objective three-dimensional measurement, standardized endpoints and long-term follow-up remain necessary. In clinical practice, success depends less on any single device or agent than on accurate analysis of scar morphology, targeting each component separately, selecting safety parameters appropriate to the skin type, and establishing a shared and realistic set of expectations with the patient from the outset.

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Chapter 11

PIGMENTARY DISORDERS (MELASMA, POSTINFLAMMATORY HYPERPIGMENTATION AND OTHERS) AND THE COSMETIC APPROACH

Abstract

Melasma and postinflammatory hyperpigmentation are among the most common pigmentary concerns encountered in cosmetic dermatology, particularly in individuals with darker phototypes. Current understanding of melasma has expanded beyond melanocyte hyperactivity to include basement membrane disruption, dermal photoaging, vascular changes, mast cells, and senescent fibroblasts, supporting a multidimensional therapeutic approach. Photoprotection, including protection against visible light, remains fundamental. Topical depigmenting agents, chemical peels, selected energy-based procedures, and tranexamic acid may be incorporated according to disease characteristics and patient risk. Newer non-hydroquinone agents, including thiamidol and cysteamine, provide additional options for long-term treatment and maintenance. Because recurrence is common and no single treatment provides permanent clearance, successful management requires combination therapy, maintenance strategies, patient education, and realistic expectation setting.

Keywords: melasma, postinflammatory hyperpigmentation, tranexamic acid, hydroquinone, visible light, depigmentation

11.1. Introduction

Pigmentary disorders are among the three most frequent reasons for presentation in cosmetic dermatology practice: a group of conditions that are medically benign in most cases but carry a heavy psychosocial burden. Melasma, characterized by symmetrical brown patches on the face, and postinflammatory hyperpigmentation (PIH), which develops after inflammation or trauma, are the two principal representatives of this group. Both are especially prominent in Fitzpatrick skin types III-VI; the fact that the majority of the Turkish population has skin type III

safety profile of oral tranexamic acid, and the emergence of non-hydroquinone agents (thiamidol, cysteamine) as safe alternatives for prolonged maintenance. Recurrence rates nevertheless remain high and no monotherapy offers a lasting solution.

The current cosmetic approach should therefore be built on accurate diagnosis, conservative procedure selection appropriate to skin type, combination therapy, uninterrupted photoprotection and indefinite maintenance. Although emerging molecules and energy-based technologies are promising, the fundamental principle remains unchanged until long-term recurrence data are published: the treatment of pigmentation is not a procedure but the management of a process.

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Chapter 12

HAIR-RELATED PROCEDURES IN COSMETIC DERMATOLOGY

Abstract

Hair-related concerns include both hair loss and unwanted hair and represent an important component of cosmetic dermatology practice because of their substantial effects on self-image and quality of life. Accurate diagnosis remains essential before initiating procedural treatment. In androgenetic alopecia, established medical therapy can be complemented by platelet-rich plasma, microneedling, and selected energy-based approaches. Low-dose oral minoxidil has increasingly entered clinical practice through emerging consensus-based prescribing frameworks. Hair transplantation remains an important option for appropriately selected patients, with advances in graft harvesting, preservation, and implantation improving procedural outcomes. The introduction of JAK inhibitors has transformed the therapeutic landscape of alopecia areata by providing disease-modifying systemic options. For unwanted hair, advances in laser technology, wavelength selection, and cooling systems have improved both efficacy and safety across a broader range of skin phototypes.

Keywords: androgenetic alopecia, minoxidil, PRP, microneedling, hair transplantation, laser hair removal

12.1. Introduction

Hair is one of the most powerful social markers of human appearance. Thinning of the hair or the presence of hair in unwanted areas, although usually benign conditions medically, impose a heavy burden on identity, self-esteem and quality of life. Consultations relating to hair therefore constitute the largest and most expectation-laden group in cosmetic dermatology practice.

Three important changes have occurred in this field over the past three years. The first is the entry of low-dose oral minoxidil into daily practice through broad international consensus documents, and the standardization of prescribing (1).

with a low level of evidence and exaggerated promises made through social media constitute serious problems for both patient safety and professional ethics. Treatment should not be started in patients whose concern is disproportionate to the objective findings and suggestive of body dysmorphic disorder, and psychiatric assessment should be recommended.

12.11. Conclusion

The most important gains of the past three years in hair-related cosmetic practice are the consensus-based and safe entry of low-dose oral minoxidil into practice, the establishment of microneedling and PRP as evidence-based components of combination therapy, improved graft survival in hair transplantation through advances in devices and technique, and the beginning of the era of disease-modifying treatment in alopecia areata with JAK inhibitors. On the unwanted hair side, wavelength diversity and cooling technologies have made safe hair removal possible in dark skin types.

The fundamental principles, however, remain unchanged: no procedure should be performed without an accurate diagnosis, underlying systemic and hormonal causes should be corrected, combination should be preferred over monotherapy, and treatment should be planned not as a procedure but as a process requiring continuity. Although regenerative technologies, exosomes above all, are promising, they should not replace evidence-based core treatments until standardization and long-term data are published.

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Chapter 13

ETHICS, SAFETY AND COMPLICATION MANAGEMENT IN COSMETIC PROCEDURES

Abstract

Ethical and safe cosmetic dermatology requires a higher threshold for intervention because procedures are frequently performed on healthy individuals for elective aesthetic purposes. Safety depends on an integrated system encompassing appropriate patient selection, psychosocial assessment, genuine informed consent, realistic expectation management, use of licensed and traceable products, practitioner competence, and an adequately equipped clinical environment. The increasing availability of aesthetic procedures outside medical settings and the use of counterfeit or unverified products have introduced additional safety concerns. Clinics performing cosmetic procedures should maintain standardized complication protocols and appropriate emergency preparedness. Transparent communication, careful documentation, and continuity of care after an adverse event are essential components of professional responsibility. Ultimately, technical skill alone is insufficient; ethical decision-making and a structured safety culture are fundamental to sustainable cosmetic dermatology practice.

Keywords: medical ethics, patient safety, informed consent, cosmetic complications, emergency preparedness, aesthetic medicine

13.1. Introduction

Cosmetic dermatology differs from other areas of medicine in one fundamental respect: the patient is often not a patient. Procedures are performed not to treat a medical illness but to alter the appearance of a healthy individual. This fundamentally changes the risk-benefit balance, because every complication occurring in a person without a disease burden is by definition iatrogenic and difficult to defend. The ethical obligation is therefore heavier, and the threshold for indication higher, than in other fields.

Ethically, the fundamental criterion is unchanged: the threshold of acceptable risk in an intervention performed on a healthy individual is low, and not performing the procedure is always a valid option in case of doubt. Managing expectations, describing the limits honestly and being able to say no when necessary are more decisive safety measures in cosmetic dermatology than the most advanced device or the newest product.

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