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Preface: Facial Skin: Contemporary Topics for the Surgeon **xv**

David B. Hom and Adam Ingraffea

Biology and Function of Fetal and Pediatric Skin **1**

Alice King, Swathi Balaji, and Sundeep G. Keswani

The development of the integumentary system is a series of events that starts in utero and continues throughout life. Although at birth, skin in full-term infants is anatomically mature, functional maturity develops during the first year of life. Pediatric skin transitions again with the onset of puberty. At each stage, there are changes in transepidermal water loss, skin hydration, and skin acidity that define the specific period of development.

Update on Techniques for the Quantitation of Facial Skin Characteristics **7**

Marty O. Visscher and Brian S. Pan

The purpose of this article is to review the strategies and methods for quantifying treatment outcomes, perhaps defined by the consumer/patient as a “decrease in perceived age.” The demand for the rejuvenation of facial skin is expected to increase as the population ages and seeks optimal outcomes from the array of available treatment modalities. This information will be of value to the plastic surgeon in collaborating with patients on evaluation and treatment strategies.

Benign Skin Neoplasms **21**

Adam Ingraffea

Benign neoplasms of the skin are commonly seen by all physicians. It is vital to distinguish these proliferations from malignant lesions. Despite their benign nature, many of these neoplasms cause aesthetic or symptomatic distress and require removal. Some of these benign neoplasms may serve as markers for internal disease or genetic syndromes. Multiple forms of therapy, including excision, cryotherapy, curettage, laser therapy, and pharmacotherapy, are available. This article discusses the epidemiology, clinical presentation, and recent advances in the management of these benign lesions.

Melanoma **33**

Adam Ingraffea

The incidence of cutaneous malignant melanoma continues to increase worldwide. It is the deadliest form of skin malignancy. This article focuses on the epidemiology, diagnosis, prevention, and new staging criteria of melanoma. The author presents the latest information on melanoma staging, non-invasive diagnostic techniques and new targeted therapies for metastatic melanoma.

Nonmelanoma Skin Cancer **43**

Lauren E. Dubas and Adam Ingraffea

Nonmelanoma skin cancer (NMSC) is the most common form of malignancy in humans. The incidence of NMSC continues to increase despite increased awareness

and sun-protective measures. If neglected or mismanaged, NMSC can cause significant morbidity and even death. The most common forms of NMSC on the head and neck include basal cell carcinoma, squamous cell carcinoma, sebaceous carcinoma, eccrine porocarcinoma, Merkel cell carcinoma, atypical fibroxanthoma, and microcystic adnexal carcinoma. Surgery is the mainstay of treatment (standard excision, Mohs micrographic surgery, curettage); however, other modalities exist, including radiation, topical immunomodulators, photodynamic therapy, and new systemic medications.

Effects of Topicals on the Aging Skin Process

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J. Regan Thomas, Tatiana K. Dixon, and Tapan K. Bhattacharyya

This article summarizes the antiaging properties of retinoids, glycolic acid, ascorbic acid, and peptide topicals. The supporting evidence is taken from the literature and the primary author's research, consisting of previously published data and new results from ongoing projects.

Photodamage: Treatments and Topicals for Facial Skin

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Marty O. Visscher, Brian S. Pan, and W. John Kitzmiller

This article provides an overview of current therapies for photodamaged facial skin and their efficacy, with particular focus on studies that use the objective, quantitative evaluation methods discussed in the previous article. The role of topically applied agents including prescription drugs and cosmetics is discussed. From this information, a schema for the relative effectiveness of therapeutic modalities in reducing perceived age is presented. This information assists the facial plastic surgeon in evaluating patient expectations and selecting the most effective program.

Stem Cells and Molecular Advances in the Treatment of Facial Skin

77

Anthony P. Sclafani

Stem cell technology has been discussed chiefly in terms of organ replacement in end-stage diseases. However, improved understanding of adult stem cells and a more nuanced appreciation of aging skin as a disease state has focused greater attention on the potential for truly regenerative and rejuvenative skin therapy with autologous cells. Through enhanced understanding of the normal processes of wound healing, systems of treatment and avenues of therapy are emerging based on modulation and amplification of the natural processes of wound healing. This article presents skin-specific developments in stem cell and growth factor science and suggests further avenues of investigation.

Approaching Delayed-Healing Wounds on the Face and Neck

81

Jeffrey J. Houlton and David B. Horn

This article provides a general approach to the assessment and treatment of poorly healing dermal wounds of the face and neck. When poor healing occurs, it can produce significant functional and cosmetic impairment. A systematic framework for treating these wounds is provided, which focuses on identifying the systemic and local factors contributing to poor healing; provides an overview of the basic tenets of wound treatment; and focuses on a general approach to preparation of the wound bed. In addition, approaching the challenge of an irradiated dermal wound and adjunctive measures to help "jump-start" a wound are discussed.

- Cutaneous Lasers** 95
Fred G. Fedok, Frank Garritano, and Antonio Portela
- There has been a remarkable development and evolution of laser technology, leading to adaptation of lasers for medical use and the treatment of skin problems and disorders. Many treatments that required incisional surgery and other invasive methods are now preferentially treated with a laser. Although laser advances have resulted in the availability of some amazing tools, they require the clinical skill and judgment of the clinician for their optimal use. This article provides a clinically oriented overview of many of the lasers valuable in facial plastic surgery. Basic science, clinical adaptations, and patient management topics are covered.
- Cutaneous Vascular Lesions** 111
Ravindhra G. Elluru
- In 1982, vascular anomalies were classified as either vascular tumors or vascular malformations. Hemangiomas were identified as benign tumors that undergo a phase of active growth characterized by endothelial proliferation and hypercellularity, followed by gradual tumor regression over the first decade. Vascular malformations were described as structural congenital anomalies derived from capillaries, veins, lymphatic vessels, arteries, or a combination of these. Unlike vascular tumors, vascular malformations were shown to have normal levels of endothelial turnover and to grow proportionately with the child. This article describes the most common types of vascular anomalies and available treatment modalities.
- Rosacea: Pathophysiology and Management Principles** 127
Nitin Chauhan and David A.F. Ellis
- This article presents an overview of the pathophysiology, epidemiology, and clinical presentations of rosacea. It also presents the therapeutic spectrum for effective management of this challenging and often confusing clinical entity.
- The Use of Negative-Pressure Therapy in the Closure of Complex Head and Neck Wounds** 137
Graham Michael Strub and Kristen S. Moe
- The evolution of wound care has seen much technological advancement over many decades. Most recently, negative-pressure therapy, by which a vacuum pressure is applied through a wound bed, has dramatically improved the surgical outcomes of complex wounds. Although initial studies focused on wounds to the abdomen, torso, and extremities, more publications are appearing that demonstrate the efficacy of negative-pressure wound therapy in the head and neck. This article reviews the history and evolution of negative-pressure therapy, highlights the current opinions on its mechanism of action, and summarizes its use in complex head and neck wounds.
- Periorbital Rejuvenation: Reticular Vein Treatment** 147
Nitin Chauhan and David A.F. Ellis
- The safety profile of certain techniques, such as sclerotherapy, is questionable in a region as precarious as the periorbital region, where complications related to vision would be catastrophic. Other safe techniques such as phlebectomy can be performed with successful outcomes but are operator dependent, require a reasonable

degree of technical ability, and can result in scarring and other complications. The aim of this article is to explore newer, laser-based treatment of these periorbital veins, discuss the physiology and the therapeutic efficacy, and better delineate the safety profile and evolution of the technique that has led to the present treatment paradigm.