Includes DVD-ROM

Edited by **Steven Fagien**

Putterman's COSMETIC Oculoplastic Surgery

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ELSEVIER

FOURTH EDITION

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Foreword

The eyes are the windows to the soul, and are our primary focus in interpersonal contact. As surgical rejuvenation of the aging face has evolved, perhaps no form of facial enhancement has been given so much attention as periorbital rejuvenation. Blepharoplasty techniques have progressed from fairly simple procedures involving predominantly skin and fat resection to complex techniques which are anatomic in their approach, focusing on aesthetic shaping of both the upper and lower eyelid. To this end, the fourth edition of *Putterman's Cosmetic Oculoplastic Surgery,* edited by Dr Steven Fagien, represents a comprehensive analysis of not only periorbital surgical techniques, but also emphasizes the aesthetic precision required to obtain consistent results with these procedures.

Why a fourth edition? The answer obviously is progress. Since the third edition was published in 1999, great strides have been made in oculoplastic surgery and cosmetic blepharoplasty in terms of a more thorough understanding of periorbital anatomy, as well as in a greater appreciation of how the soft tissues of the periorbitum age. These foundations now provide surgeons with the ability to perform not just simple cosmetic enhancement but rather to reconstruct the anatomic changes which occur in aging, producing more natural results for our patients. The procedures illustrated in the text demonstrate methods to individualize shaping of the upper and lower eyelid (while preventing lid malposition), blending the lid–cheek junction, volume enhancement of the aging upper eyelid, as well as creating balance between the forehead, brow, eyelid and upper cheek. With this increased array of surgical options comes the need for increasing technical expertise, as well as developing a more sophisticated aesthetic analysis, all of which are so well discussed in this current edition.

Perhaps no area of cosmetic surgery lends itself to a multidisciplinary approach more than periorbital rejuvenation. Evolving from the functional aspects of orbital reconstruction, in conjunction with the aesthetic concepts well-founded both in plastic surgery as well as oculoplastic surgery, a synthesis of both specialties is required to optimize results in eyelid surgery. This theme is clearly noted throughout Dr Fagien's current edition, with chapters on periorbital anatomy and aging, as well as eyelid aesthetic analysis written by both oculoplastic and plastic surgeons. This text is further augmented by collaborations by oculoplastic and dermatologic colleagues illustrating an array of non-surgical procedures for facial rejuvenation as well as methods of improving the appearance of lower lid skin through chemical peeling and laser resurfacing. In my opinion, the strengths of the current edition lie in this multi-specialty approach, providing readers with a wide spectrum of methods to optimize precision and increase consistency in their surgical results.

In summary, I would like to congratulate Dr Fagien for not only undertaking, but completing this important compendium of knowledge which comprises the fourth edition of *Putterman's Cosmetic Oculoplastic Surgery*. To update an already classic textbook is a major endeavor, but, in my opinion, Dr Fagien has made this textbook not only more current, but has also taken it to a new level of quality. With the plethora of procedures available in cosmetic blepharoplasty, it is refreshing to finally have a resource that brings all of this knowledge together in a single text. My congratulations to Dr Fagien and to all of the contributors of the fourth edition for their worthwhile efforts to educate surgeons focusing on cosmetic oculoplastic surgery.

James M. Stuzin, MD
Miami, Florida

Preface

First, it is a true honor and privilege to have been asked by my mentor and friend, Allen Putterman, to continue his scriptural legacy with the opportunity to become the editor of *Cosmetic Oculoplastic Surgery*, beginning with this fourth edition. At first, I accepted the invitation with serious trepidation as I was unsure of what I could add to this highly acclaimed text book that has earned the distinction of being one of the world's best reference texts on aesthetic periorbital procedures and techniques from the very start and has continued to improve through three editions. I initially agreed to this task simply out of true admiration, appreciation, and gratitude to my teacher, Allen – I realize that without him, I would never have embarked on my career journey that I still, to this day, consider as an enormous gift and am eternally thankful for.

When it became more obvious to me that this fourth edition was clearly in the works and that I would be taking the helm, I wanted to make it something that continued in the tradition of this book yet could stand on its own and not simply be a revision of prior work. Additionally, I wanted to get back to the roots of oculoplastic surgery (even a re-simplification of the title) that related much to my philosophical beliefs that we, as oculoplastic surgeons, have an enormous advantage in the understanding of eyelid and periorbital anatomy, physiology, surgery, and the recognition and treatment of complications that may occur, and that *this* is where we should focus our educational contributions. As well, my exposure to many individuals outside of our relatively small sub-specialty has helped me realize the large contributions by our colleagues in the other aesthetic specialties, not only periorbital surgery, but also current concepts of periorbital aging and applied practical anatomy, and the non-surgical treatments for aesthetic enhancement of the aging face. Inasmuch, I have recruited and am truly thankful and appreciative for the contributions in this text by our plastic surgery and dermatology colleagues who are also well known in their respective fields and beyond, and add greater depth to the project.

In this fourth addition, you will find that several of the chapters on the classic procedures have been updated by their noted authors to keep current with the history and improvements of these various periorbital surgical techniques. New and never previously published chapters have been added, one on updated concepts of periorbital and facial aging as well as another chapter dedicated to current revelations of detailed applied anatomy that not only reflect a better understanding of the static and functional anatomy but are more relevant to the latest aesthetic periorbital surgical techniques. New chapters demonstrating alternative approaches to upper and lower blepharoplasty have also been added to revisions of existing chapters to illustrate options and add a larger perspective to surgeons depending on the presenting situation and the desired outcome. The attempt was not to include every option for each topic, yet provide the reader with the rationale and current approach by the individual contributors. Another new chapter is dedicated to the use of alloplasts for periorbital aesthetic enhancement that demonstrates that at times there is not an adequate soft tissue solution to a wide variety of patient presentations and desires. A chapter dedicated to decision-making in cosmetic eyelid plastic surgery has also been added that reveals a multitude of pearls that hopefully will assist the novice surgeon to be aware of common pitfalls that are often quite avoidable. And finally, two chapters on injectable agents for facial aesthetic enhancement (one on botulinum toxins and the other discussing a variety of soft tissue augmentation agents) have been completely overhauled with the enormous contributions by the my valued colleagues and co-authors, adding an international perspective that highlights how this component of our aesthetic practices has essentially exploded with the many options, improved agents and techniques now available.

The book has been also graced by a world-class editorial and art staff that has assisted in the format, development, and design for which I am extremely proud of and honored to have worked with. Another exciting and highly welcomed addition is the inclusion of a DVD that highlights many of the surgical procedures and techniques discussed in the book to give the reader a greater perspective of the OR and clinical experience that will add to your ease in acquiring the skills necessary for the decision making and precision surgical/procedural delivery.

Frankly, many (especially outside the medical field) have asked, 'why contribute so much valued time and energy to this book'? There are few (if any) businesses that so freely and selflessly offer to their colleagues (sometimes viewed as competitors) such a display of collective experiences that do not directly benefit the educators. The answer is always quite simple – to

improve patient care and outcomes for all surgeons. This is what my mentor has done through forty years of training residents and fellows and this is what I shall do. It has been my attempt to continue with my love and appreciation of the aesthetic surgery education process with this display of a consortium of world renowned experts that I have organized into this comprehensive offering. If I may speak for them, I believe they also share in this philosophy. It is my sincere hope that you enjoy the fourth addition of this classic text and that it adds to your understanding and performance of aesthetic periorbital surgery so that you gain the proficiency to deliver highly satisfactory results for your patients.

Steven Fagien

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Dedication

I dedicate this book to all of my teachers over the many years who had faith in me and offered their selfless commitment to education . . . and of course, to each of the four beautiful girls in my life – Debra, Samantha, Alyssa, and Kayla – that continue to also make each day a learning experience and a blessing to wake up to.

CHAPTER 1

The History of Cosmetic Oculoplastic Surgery

Lawrence B. Katzen and Steven Fagien

Whether regarding cosmetic oculoplastic surgery or life in general, a knowledge of the history that brought us to the present provides many advantages, most of which relate to warnings of potential unfortunate events, or encountering concepts that have been already discovered. If one knows the history, one can benefit from the experiences of others, and even endeavor to improve upon existing methods. Far too often, I read about or watch surgeons display their 'discoveries' only to be disappointed that they were unaware of, or do not acknowledge, those before them who, even many years previously, had authored the same results. So many of the procedures discussed today in the literature, at meetings, and in this text have roots far back in time. In this chapter, I have added to the comprehensive writings of Larry Katzen, who traced back some of the pinnacle historical discoveries of periorbital surgery. For instance, in his research, he found that the first recorded resection of excessive upper eyelid skin was performed over 2000 years ago. Many other procedures performed today such as resection of orbital fat, and the formation of the upper eyelid crease also have a long history, as do the appreciation and value of reviewing preoperative photographs, and cultural-specific attitudes towards cosmetic surgery. In this chapter, we will present some of the historical discoveries and developments of cosmetic oculoplastic surgery that have brought us to the present.

Before the technicalities of cosmetic surgery are presented, we provide a background that further contributes to our appreciation of what has gone into the development and advances of modern cosmetic eyelid and facial surgery, and demonstrate that many of our current techniques are merely modifications of those developed long ago.

This chapter has been updated to include the many new advances in cosmetic eyelid plastic surgery and aesthetic facial rejuvenation over the last 20 years. Not surprisingly, some procedures and techniques have been improvements of existing methods that had fallen out of favor, but have been reintroduced as promises of more recent developments have not lived up to expectations. These include the origins and evolution of some of the more recent technological advances, including laser surgery and skin resurfacing, extended and more sophisticated periorbital and midfacial procedures, the latest devices for improved soft tissue fixation, botulinum toxin, and an update on the advances in injectable agents for facial soft tissue augmentation.

Steven Fagien

Ancient medicine

> *Gather a fold of lid skin between a couple of fingers, or raise it up with a hook, and lay the fold between two small wooden bars or rods as long as the lid and as broad as a lancet. Bind their ends very tight together. The skin between these small pieces of wood, deprived of nutrient, dies in about ten days, the enclosed skin falls off, leaving no scar.*
>
> *The Tadhkirat of Ali ibn Isa of Baghdad*

Cosmetic eyelid surgery today has the benefit of 2000 years of development and refinement of surgical techniques and instruments. Ali ibn Isa (AD 940–1010) described the procedure just quoted more than 1000 years ago (Fig. 1-1), at a time when his medical treatment for 'oedema of the lids' was 'letting blood from the head, and treating the eye with a preparation of celandine, sandlewood, and endives. . . .'[1]

Aulus Cornelius Celsus, a Roman encyclopedist and philosopher in the first century, was probably the first to comment on the excision of skin of the upper eyelids when he described the treatment of 'relaxed eyelid' in his *De re Medica* (AD 25–35).[2] *De re Medica* was not published until 1478, following its rediscovery by Pope Nicholas V.

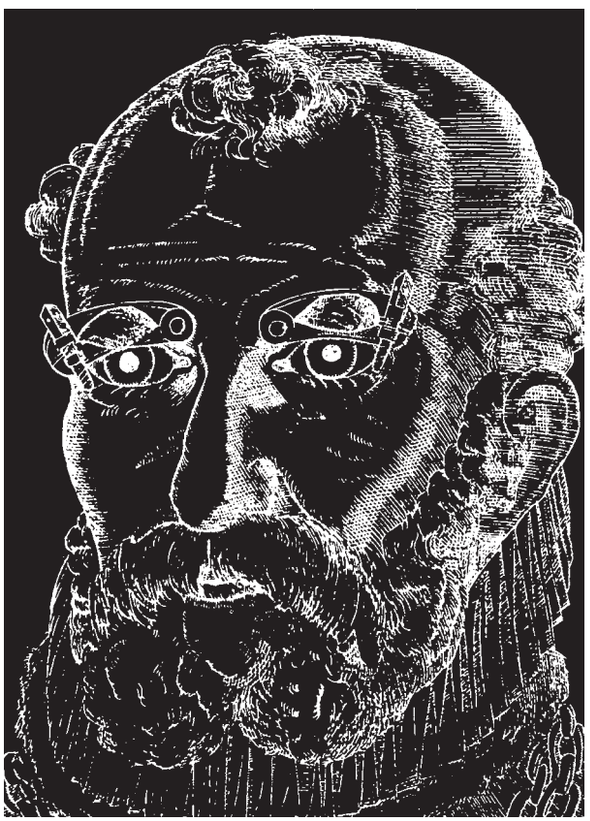

Figure 1-1 Early technique of excision of excess skin of the upper eyelid.

Even before Celsus, the Hindus were known to have referred to cosmetic and reconstructive surgery about the face. The accepted form of corporal punishment in India 2000 years ago was amputation of the nose. The surgeons of this time became so skilled in reattaching this appendage that officials began to throw the amputated nose into the fire to ensure their goal of disfigurement. It is interesting that the skilled surgeons who were able to reattach the nose successfully were actually members of the lowly tile makers' caste.[3]

Modern cosmetic eyelid surgery

Blepharoplasty (Greek *blepharon*, meaning eyelid, and *plastos*, meaning formed) was originally used by von Graefe[4] in 1818 to describe a case of eyelid reconstruction that he had performed in 1809. This meaning prevailed for the next 150 years.

In the 1913 *American Encyclopedia of Ophthalmology*,[5] blepharoplasty is defined as the reformation, replacement, readjustment, or transplantation of any of the eyelid tissues. In contemporary usage, blepharoplasty refers to the excision of excessive eyelid skin, with or without the excision of orbital fat, for either functional or cosmetic indications. The cosmetic indications have been recognized by physicians only since the turn of the 20th century, but are now the most common reasons for such surgery on the eyelids. This change followed the development of improved operative techniques, better surgical results, and control of sepsis as well as changing social mores.

It is difficult to determine whether the 'relaxed eyelid' described by Celsus was a true ptosis or an excess skin fold. In any event, by the late 1700s, reports began to appear in Germany[6] specifically identifying the excess fold of the upper eyelid. Beer's 1817 text is credited with providing the medical literature with the first illustration of this eyelid deformity.[7] Many different authors from the first half of the 19th century began advocating excision of this excess skin, including Mackenzie,[8] Alibert,[9] Graf,[10] and Dupuytren.[11]

The first 'accurate' description of 'herniated orbital fat,' written in 1844 by Sichel,[12] did not create a wave of surgical excisions because surgery at that time was performed only for functional reasons. The case of *Fetthernien* reported in 1899 by Schmidt-Rimpler,[13] which described herniated orbital fat, was clouded by the later report by Elschnig,[14] who called the same patient's condition a lipoma.

Near the turn of the 19th century, Ernest Fuchs[15] attempted to decipher the confusing terminology that had developed in the literature. 'Ptosis adiposa,' the

misnomer used by Sichel, and 'ptosis atonica,' used by Hotz,[16] had been introduced earlier in the 19th century. Sichel[12] had claimed that the excess upper lid fold was filled with fat, which caused it to hang down over the lid margin. Hotz believed that the skin was normally attached to the top of the tarsus, and that the loss of this attachment created an excessive upper lid skin fold with a pseudoptosis. It was Fuchs who recognized the importance of the weakening of the fascial bands connecting the skin and orbicularis with the tendons of the levator in the development of the excess skin fold. In his 1892 text, Fuchs[15] wrote:

> *So also the ptosis adiposa of Sichel, which consists in the fact that the covering fold of the upper lid is of unusual size, so as to hang down over the free border of the lid in the region of the palpebral fissure, does not belong under the head of ptosis proper. It was formerly assumed that this enlargement was caused by an excessive accumulation of fat in the covering fold, for which reason the name of ptosis adiposa was given to it. Its true cause, however, depends upon the fact that the bands of fascia connecting the skin with the tendon of the levator . . . and with the upper margin of the orbit are not rigid enough; consequently the skin is not properly drawn up when the lid is raised, but hangs down in the form of a flabby pouch (Hotz). Except for the disfigurement it causes ptosis adiposa entails no disagreeable symptoms. It can be removed by simple ablation of the excess of skin, but it is better, although also more tedious, to attach the skin to the upper border of the tarsus by Hotz's operation, and thus prevent its drooping.*

And so Fuchs was the first to recognize the cosmetic value of reformation and elevation of the eyelid crease. Fuchs[17] is also credited with originating the often misused term *blepharochalasis* in 1896. Sometimes used to describe the changes associated with herniated orbital fat, this term should be reserved for those cases of thickened and indurated eyelids, most often found in younger women, and associated with recurrent episodes of idiopathic edema.[18,19] The term *dermatochalasis* was introduced 56 years later by Fox[20] to describe the apparent excess eyelid skin associated with aging.

In the early 1900s, the historical focus on cosmetic eyelid surgery shifted to the United States, where Conrad Miller,[21] in 1907, produced *Cosmetic Surgery: The Correction of Featural Imperfections*, the first published book on cosmetic surgery. This edition, which covered many aspects of plastic surgery, contained the first photograph in medical history to illustrate the lower eyelid incision for removing a crescent of excess skin. It is interesting to note Miller's surgical technique. In his discussion of the lower eyelid incision, Miller stated that 'just sufficient skin is left along the margin of the lid to permit the stitches being passed in closing. The line of union is brought in this way under the shadow of the lashes, and is entirely invisible.' On excision of the fold above the eye, Miller wrote that 'the fold above the eye after infiltration is picked and trimmed away. The line of closure here is at the upper extremity of the lid so that the slight line of the union is hidden in the fold between the lid and the brow when the eye is open, and only shows slightly when the eye is closed.' Miller's enlarged text,[22] which followed in 1924, provided diagrams of incision sites for upper and lower eyelid blepharoplasty that are remarkably similar to those commonly used today (Fig. 1-2).

Frederick Kolle,[23] in a 1911 text on plastic and cosmetic surgery, wrote about wrinkled eyelids in a chapter on blepharoplasty. He probably was the first to recognize and note the safety and value of marking the skin preoperatively to determine the amount of excess skin to excise.

Adabert Bettman[24–26] added to the contributions by Miller and Kolle in his publications in the 1920s, in which he described precautions, specifically related to surgery about the eyelids, to be taken in minimizing postoperative scarring. He emphasized gentle treatment of the tissues, exact apposition of wound edges, elimination of tension on all wound edges, and timely suture removal. These, of course, are concepts that are still important today.

The first work in English devoted solely to oculoplastic surgery was written by Edmund Spaeth.[27] *Newer Methods of Ophthalmic Plastic Surgery*, published in 1925, deals entirely with eyelid reconstruction and does not mention cosmetic surgery.

By the late 1920s, still no mention had been made in the United States of the excision of herniated orbital fat for cosmetic reasons. Although advances and progress in medicine (including antibiotics, finer suture materials, improved technology, and better control of sepsis) allowed for the beginnings of the public desire for and acceptance of cosmetic surgery, it was still frowned on by the majority of physicians.

In the same decade in Europe, Julian Bourguet[28] was also developing new techniques in cosmetic eyelid surgery. In 1924, he was probably the first to describe transconjunctival resection of the pockets of herniated orbital fat. In the following year, he published probably the first before and after photographs of patients who had undergone cosmetic lower eyelid surgery (Fig. 1-3).[29] In 1929, Bourguet[30] described the two separate fat compartments of the upper lid and advocated their removal. Many surgeons followed his lead, including Claoué[31] and Passot.[32] Passot[32,33] is also credited as

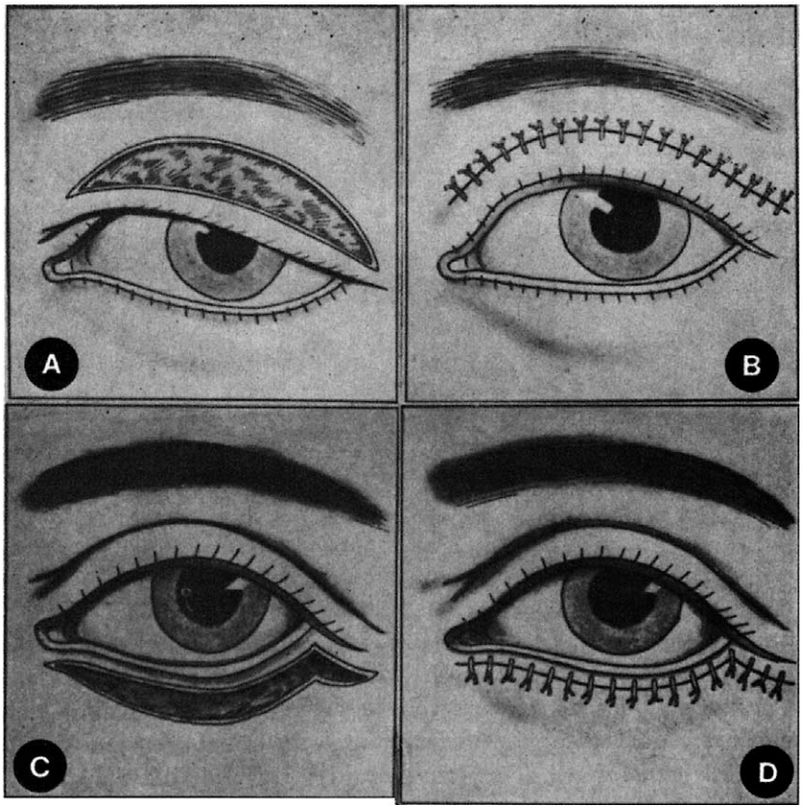

Figure 1-2 **A**, An upper eyelid incision. **B**, An upper eyelid closure. **C**, A triangular resection modification to lower eyelid incision to prevent ectropion. **D**, A lower eyelid closure. From Miller CC: Cosmetic Surgery: The Correction of Featural Imperfections. Philadelphia, FA Davis, 1924. With permission.

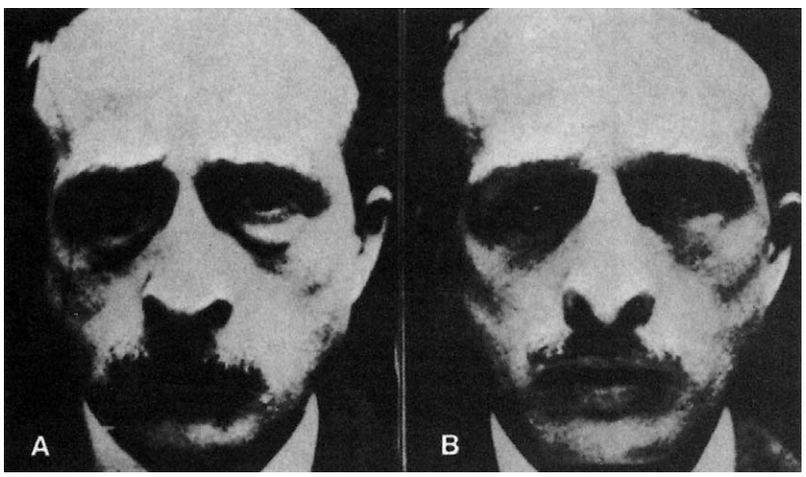

Figure 1-3 Earliest photographs illustrating preoperative **(A)** and postoperative **(B)** appearances of lower eyelid blepharoplasty. From Bourguet J: Chirurgie esthétique de la face: Les nez concaves, les rides et les 'poches' sous les yeux. Arch Franco-Belges Chir 1925; 28:293. With permission.

being the first to name the supraciliary brow incision for the correction of brow ptosis. It is also quite interesting that Passot expressed his objections to the secrecy of techniques practiced by some of his contemporaries: 'By keeping their methods secret, they allow a certain suspicion to exist about their procedures.'[34,35] These 'suspicions' for many procedures can be related to the present.

At the same time, one of the first female surgeons to appear in the history of cosmetic surgery was perfecting her techniques in Paris.[36,37] Suzanne Noel's 1926 book on cosmetic eyelid surgery[38] was the earliest to include numerous preoperative and postoperative photographs.[36] Noel also initiated the emphasis, for the benefit of other surgeons, on the advantages and the importance of looking at these photographs and showing them to one's patients. She was also the first to be photographed performing a blepharoplasty. Thanks to the contributions of Noel and others and to the development of photography as an art and science,