SURGICAL ANATOMY OF THE OCULAR ADNEXA
Ophthalmology Monographs

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SURGICAL ANATOMY OF THE OCULAR ADNEXA

A Clinical Approach

SECOND EDITION

David R. Jordan, M.D., F.A.C.S., F.R.C.S.C.
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David R. Jordan
Louise Mawn
Richard L. Anderson
I am pleased to write the foreword to this text, *Surgical Anatomy of the Ocular Adnexa*. What should be included in a valuable anatomy book written for surgeons? How about:

- A concise description of the clinical anatomy
- An correlation of how the anatomy relates to the pathophysiology of the disorders we see daily
- How surgical manipulation of the anatomy can correct an abnormality

This information is exactly what Dr. Jordan outlined in his preface to this text. You, as a reader and surgeon, will be happy to see that David and his coauthors, Louise Mawn and Rick Anderson, have provided this information and more.

Why is a new anatomy text important? After all, anatomy hasn’t changed for millennia. Anatomy, of course, is the foundation of our surgical practices. As unchanging as anatomy is, the pertinent complexities of the periorbital and facial anatomy change as we ask new and more detailed questions about existing clinical problems and face new clinical challenges. For example, the recent descriptions of the osseo cutaneous ligaments of the face have given us a new understanding of the lid cheek junction improving lower blepharoplasty results. Work on the motor innervation of the eyelid has explained why the standard external DCR incision can decrease blinking in the early post operative course. As we learn to develop new clinical tools and techniques, areas of less traditional anatomic interest become more important. Prior to botulinum toxin, there was not much interest in learning the anatomy of the glabella including the individual contributions of the eyebrow elevators and depressors. As the field of ophthalmic plastic surgery evolves, new areas of clinical interest are developed, such as the facial cosmetic surgery and complex skull base procedures. The authors have nicely incorporated these anatomic areas in the text making the anatomy and clinical correlates accessible and applicable to all readers.
I am pleased to say that each of the authors is a friend, a colleague and a mentor. The authors share common traits:

- Passion for their work
- Curiosity and innovative spirit
- Active incorporation of scholarly work into busy clinical practice
- The generosity to share their experience and skill with others

We can all benefit from emulating these ideals in becoming better clinicians and scholars.

Each of us has our own style of learning. With a densely packed text such as this, I prefer to skim the text to get a feel for the content and the organization. I will go back to an area that I am interested in, or perhaps start again from the beginning reading a section several times over a period of a few days. I like to learn in layers, making sure that I have the overall principles in mind before moving into the details. For me, this technique works especially well for anatomy. Finally, I might follow up on the suggested readings for other details. Whatever your style of learning, you will benefit from a study of this text.

Congratulations to the Drs Jordan, Mawn and Anderson on an excellent book that will be of great use to clinicians for years to come.

Jeffrey A. Nerad
An appreciation of the anatomy of the eyelid, orbit, nasolacrimal system, and periocular region is essential to an understanding of the wide variety of diseases and conditions that occur in these areas. The second edition of this monograph is organized into seven chapters highlighting the major adnexal structures and systems. In each chapter, there are drawings of important areas to help the reader conceptualize the anatomy. These are supplemented with cadaver photographs to illustrate a more lifelike situation. Salient anatomic features are correlated to real clinical situations in succinct vignettes entitled “Clinical Application.”

The educational objectives of the monograph are as follows:

- develop a thorough understanding of the anatomy in the eyelid, orbit, nasolacrimal, and periocular regions;
- foster an appreciation of how knowledge of the anatomy leads to a better understanding of the pathophysiology of various disease processes involving the eyelid, orbit, nasolacrimal, and periocular regions; and
- convey the importance of anatomy in the surgical approach to various disease processes in the eyelid, orbit, nasolacrimal, and periocular regions.

David R. Jordan, M.D.
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The authors wish to acknowledge their appreciation of the efforts of many persons who contributed to the development and production of the monograph, including editors Catherine Barnes and Catharine Carlin. Special thanks for the tireless efforts of Tim Hengst for providing all of the outstanding illustrations. Gratitude is extended to the late A. Gardner Watson, M.D. (1918–2003), who provided anatomic dissection notes that he had accumulated during his distinguished career. Dr. Watson organized these notes into a dissection manual for ophthalmology residents, which has been in use at the University of Ottawa for more than 45 years and which formed the basis for the first edition of this manual. Appreciation is expressed to my co-authors (Louise Mawn and Rick Anderson) for their chapter contributions and editorial comments, as well as to the ophthalmology residents at the University of Ottawa for their cadaver dissections; the photographs in this monograph are a product of those dissections. Special thanks for the inspiration offered by the late Dr. Ronald E. Jordan (1931–1994) for suggesting a pathway in medicine and ophthalmology. Tremendous gratitude is extended to Dr. D. Tse, Dr. J. Nerad, and Dr. R. Anderson for sharing their knowledge and skills in oculoplastics surgery during my fellowship years and for providing so much encouragement. Last but not least, the hours upon hours of editing, re-editing, updating, and reorganizing this monograph over 12 months could not have been carried out without the never-ending support of my dear spouse, Judith Allen.
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This book is dedicated to my spouse, Judith Allen, without whose support it could never have been written; to my children, Ryan, Jeff, and Tyler, who have had less of my attention because of it; and to my parents, Ronald and Wilona Jordan.
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SURGICAL ANATOMY OF THE OCULAR ADNEXA
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Numerous oculoplastic surgical procedures are performed on the forehead, eyebrows, eyelids, and canthi. An understanding of the anatomy of these structures, as well as of the nearby temporal artery and facial nerve, is essential for the surgeon working in this region. In this chapter, the surface anatomy is described first, followed by a more detailed description of the tissue beneath.

1-1 FOREHEAD

The skin of the forehead and cranium, or the “scalp,” is traditionally considered as five layers (Fig. 1-1): skin, subcutaneous tissue, galea aponeurosis, loose areolar tissue, and periosteum. These layers are present consistently throughout the head, with some slight modifications in certain areas (e.g., the brow area). These layers can be easily remembered with the mnemonic “SCALP” (S = skin, C = subcutaneous tissue, A = galea aponeurotica, L = loose areolar tissue, P = pericranium). The skin of the forehead and temporal region is usually relatively thick and rich in sebaceous glands. However, in some elderly individuals the skin of the temporal forehead can be quite thin and consequently requires a greater degree of care during surgical procedures (e.g., endobrow lift) and resurfacing (e.g., laser or chemical).

1–1-1 Eyebrows

Although the eyebrows are technically part of the scalp rather than of the eyelids, they have important functional and surgical relationships to the lids. The eyebrows lie at the junction between the upper eyelids and the forehead. They lie over each superior orbital rim, are separated by the glabella, and are formed by thick, strong, skin-bearing hairs. The underlying muscle fibers, with