

Ophthalmic Surgery

PRINCIPLES AND PRACTICE

Edited By

GEORGE L. SPAETH, M.D.

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Wills Eye Hospital
Philadelphia, Pennsylvania

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Preface

The ophthalmic surgeon really can improve the quality of life. He or she has the ability to restore a productive and enjoyable life by removing a cataract, transplanting a cornea, removing bloody vitreous, or reconstructing an injured person's face; sight can be preserved by repairing a ruptured globe or relieving excessive intraocular pressure; function and appearance can be improved by correcting a deviated eye; and life may be maintained by treating malignant tumors.

It is not surprising that ophthalmic surgeons find deep satisfaction in their work.

The competent surgeon is both knowledgeable and experienced. No novice can be a great surgeon; but experience alone is not adequate. Knowledge is the foundation on which surgical competence is built. The purpose of this text is to bring together in one book those things the ophthalmic surgeon needs to know to practice his or her craft well.

Competent surgeons may not always agree regarding either principles or practice. In order to provide information that is broadly based, the contributors to this text have been selected because they are knowledgeable, experienced, articulate, catholic, and come from different backgrounds. Personal preferences, unintentional omissions, and even idiosyncrasies are not completely avoidable. To provide balance, and to assure that the information given is pertinent, each chapter has been reviewed by another author. In addition, some chapters have been further reviewed by other experts of great skill and experience. I'm grateful to these reviewers for their invaluable contributions. They have added to the final appearance of the work. They should not, however, be held accountable for the final rendering, which is entirely the editor's responsibility. Those to whom particular thanks go include Philip Knapp, M.D. (Extraocular Muscles); P. Robb McDonald, M.D. (Cataract Surgery); Peter Watson, M.D. (Glaucoma Surgery); and Max Fine, M.D. (Corneal Surgery).

Mark Weakley is the principle illustrator for this text. Virtually all of the unsigned drawings were made by him, and he has my thanks for being so deeply concerned with depicting precisely each author's intent. Deborah Randall provided other illustrations; her professional skill and invariable completion of work prior to the time it was expected made it a particular pleasure to work with her.

This text reflects the influence and help of many people: my father, whose surgical text and whose life both are models for me; Otto Krayner, whose personal brilliance and intellectual breadth inspired me at medical school (How will I ever forget his question kindly but seriously posed to me at our first meeting—"What is the purpose of a physician?"); Irving H. Leopold, who keeps asking the right questions; Ludwig von Sallmann, simultaneously a fine clinician, teacher, and investigator; and James Shipman, who understood that the value of knowledge develops only when it is shared. Heartfelt thanks go to

Kate McVay and Mary Ann Sammartino, who, despite many other responsibilities, kept this text going through numerous visions and revisions; to the contributing authors for the thought, effort, and expense of preparing their valuable chapters; to Lisette Bralow and Erika Shapiro of the W. B. Saunders Company, who have been grand to work with; and to all teachers who have enthusiastically shared their knowledge and experience, many of whom have received little reward other than the awareness that they have made the world a better place.

GEORGE L. SPAETH, M.D.
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1

Principles of Ophthalmic Surgery

Chapter 1

Introduction

GEORGE L. SPAETH

THE CRAFTSMAN, THE TECHNICIAN, AND THE
COMPLETE SURGEON
THE CLINICAL TRIAL

TRAINING REQUIRED TO BECOME A
PRACTICING OPHTHALMIC SURGEON

We hope this text will be a practical guide for the ophthalmic surgeon. In reaching our goal — to present a comprehensive treatment of eye surgery in a single volume — we have attempted to be thorough without being exhaustive, as a truly full commentary would fill many volumes.* The subject of cataract extraction alone, for example, requires discussion of suturing details, manufacture and choice of intraocular lenses, rehabilitation of the aphakic individual, management of complications following surgery, and the technique of extracapsular extraction, all of which deserve full coverage. Because of the vast increase in knowledge within each of the subspecialty areas and the difficulty of dealing with the entire subject of ophthalmic surgery, recent years have seen the introduction of much more specialized texts. A selected list of some specialty volumes is included in the references at the end of this chapter.¹¹⁻⁵⁰

The techniques of ophthalmic surgery have proliferated so rapidly and extensively that a single surgeon cannot possibly be

fully competent in all aspects. Those who dispute this are either unaware of the field or unaware of their own limitations. Indeed, one surgeon can probably not be fully competent in all procedures even within a single subspecialty area, such as glaucoma.

Fortunately for our patients and for our ease of mind, the majority of surgical eye diseases can be properly managed with relatively few procedures. The ophthalmic surgeon need not be competent in every aspect of surgery in order to give excellent care. For example, a surgeon fully proficient in peripheral iridectomy, trabeculectomy, cataract extraction through a clear corneal incision, and cyclocryotherapy can provide most glaucoma patients fine care. It is not necessary to have extensive experience with scleral trephining, iridencleisis, anterior-lip sclerectomy, posterior-lip sclerectomy, and peripheral iridectomy with thermal sclerostomy. These procedures are relatively interchangeable, and familiarity with all of them will not substantially increase the surgeon's ability to treat a great number of patients. By the same token, a surgeon who is competent in all these latter techniques but who cannot properly perform a trabeculectomy will find it difficult to provide optimal care. There is a valid concept of a "core curriculum" in the field of ophthalmic surgery; there is also a body of knowledge of greatest clinical

*Perhaps the first book on ophthalmic surgery was that by Bartisch.² The comprehensive text by E. B. Spaeth was for many years widely used throughout the world.⁸ Other early texts dealing with the full spectrum of ophthalmic surgery included those by Arruga,¹ Stallard,⁹ and Wiener and Alvis.¹⁰ Several comprehensive surgical atlases were also published, including that by Berens and King.³ Few other comprehensive texts have appeared. They include those by Davidorf,⁴ Duke-Elder,⁵ Dorrel,⁶ and Miller.⁷

value. We have tried to include here only material of essential clinical worth.

In this text we have emphasized *selectivity*. For example, peripheral iridectomy with thermal sclerostomy is the only standard filtration procedure described. The choice is not meant to imply that other similar procedures are of lesser worth. It is, rather, a statement that peripheral iridectomy with thermal sclerostomy is probably *as satisfactory* as any operative procedure in its class, and that experience with the other procedures of similar nature is unnecessary for the average surgeon.

We have also included procedures that are infrequently used, not because the techniques are poor, but rather because the conditions for which they are indicated are rare. For example, for the surgical treatment of congenital glaucoma to be satisfactory, the surgeon must be competent in the technique of trabeculotomy. Consequently, trabeculotomy is discussed in detail, despite the great rarity of congenital glaucoma. Though we believe that goniotomy is actually preferred in most cases of uncomplicated congenital glaucoma, the procedure has such limited usefulness and requires such special training and technique that it is described only briefly. Furthermore, trabeculotomy can be used in virtually all cases of congenital glaucoma, whereas goniotomy cannot.

Inclusion of a procedure in the text should not be taken as tacit comment that all surgeons ought to be performing this operation. Obviously, some surgeons are more competent than others, in performing certain techniques: some are better craftsmen, some better technicians; some have better judgment. A few are better than most at all aspects of care.

Thus, many factors enter into the decision of where and by whom a particular surgical procedure will be best performed. A most important consideration is that the patient have confidence in his surgeon. Admittedly some patients will not have confidence in anybody, but such cases are rare.

Whenever feasible, surgery should be performed at a facility close to the patient's

home. The surgical experience can itself be upsetting, and the support that comes from familiar surroundings is an important factor, especially for the very young and very old. For example, when surgery is performed at a distance from the patient's home (in another city, for example) and postsurgical complications occur, the patient finds himself in the difficult position of trying to decide whether it is worth continuing the trips to the operating surgeon or whether it is wiser to return to the local physician. The belief that surgery will be more expensive and inconvenient when performed at a distance also militates against referral for surgery.

On the other hand, certain factors favor referral even in cases where the patient has confidence in the local surgeon. If the local surgeon believes another surgeon to be more competent in the procedure required, the consideration of referral should arise. In this regard, a recent study has found substantially fewer postoperative complications in referral centers than in more peripheral institutions.¹³ It is our impression that most patients are aware that complete success is not an invariable product of surgical treatment and are prepared to accept results less desirable than hoped for. However, the entire foundation for such acceptance on the part of the patient is unwavering faith that the care received was of at least standard quality. Moreover, there are a number of individuals who will be unable to cope with a poor result unless they profoundly believe that they have had what is typically called "the best care." Surgeons caring for patients who demonstrate a lack of confidence are courting catastrophe for themselves and their patients when they decide to proceed with surgery. The local surgeon is not obligated to perform surgery when referral services are reasonably available.

Where the facilities or personnel for competent surgery are not available, it is often better to avoid surgery completely. A patient with useful vision but uncontrolled glaucoma will not be helped by a botched filtering procedure; nor will the person with 20/200 vision due to keratoconus or

vitreous hemorrhage be benefited by a poorly performed corneal graft or vitrectomy.

In some regions of the world, whatever care is present is the best care because it is the only care. There are many other situations in which referral is considered unwise, for one reason or another. We hope that this text will be of adequate assistance to surgeons operating in such circumstances. We also hope that it will provide information that will help ophthalmologists everywhere make reasonable decisions regarding what type of ophthalmic surgical care is currently optimal.

THE CRAFTSMAN, THE TECHNICIAN, AND THE COMPLETE SURGEON

The development of technology is one of the most characteristic features of the history of the last hundred years. In this period the scientific method became accepted as a fundamental aspect of medical care. During the last half of the nineteenth century, the image of the surgeon started changing from that of a compassionate but often ineffective prognosticator to that of an effective medical scientist. Prior to that time, the surgeon was revered and rewarded primarily because of his ability to support his patient during difficult times; this required mastery of the craft of medicine. Of course, many individuals benefited as well from the mechanical skills of surgeons, but all too often the limitations of the technology of the time predetermined that the result would be of limited help. Thus, the great surgeon of the past was fundamentally a great craftsman.

Craftsmanship requires knowledge of the tools and materials used in performing one's craft. In the craft of surgery, these include surgical instruments, anesthesia, knowledge of the treatment of injury and disease, and the indications for and techniques used in many different types of operative procedures. The surgeon must also understand the patient — his nature, needs, and wishes, and the unique qualities of each patient and each interaction.

The craftsman is personally involved with his or her work, which therefore carries with it a subjective component. The craftsman recognizes that each work created is unique. The technologist, on the other hand, attempts to remove himself as much as possible from his work. Technology implies objectivity, standardization, and uniformity of results. The results of the technologist are relatively easy to measure, and hence performance is relatively easy to evaluate. On the other hand, the quality of the craftsman's product is difficult to measure. Is, for example, Cellini's Rococco salt cellar a "better job" than the Cro Magnon man's flint arrowhead or Calder's starkly simple mobiles? Furthermore, the *process* of creating is as important to the craftsman as the product itself. The surgeon as a craftsman learned by apprenticeship. He taught by example. His major activity was demonstrating care. His product was not so much "cure" as it was "care."

Great surgeons today are still great craftsmen, but the technological revolution changed the surgeon's role dramatically. It provided the means for him to be more effective. No longer did the surgeon study the arts, but rather physics, chemistry, and statistics. Truly astounding improvements in the surgical product resulted from this technological revolution. Unfortunately, the benefits are still not adequately taken advantage of. For example, the methodology of the scientifically designed clinical trial (see the following section), so widely accepted by academicians as the proper way to assess treatment, is as neglected in the practice of surgery as it is in the field of medicine. As a result, the surgeon does not have as much scientifically valid information to answer his basic questions as could be hoped for. Which suture is best for cataract extraction? When should a hyphema be drained? Does peripheral iridectomy cause cataracts? Is cystoid macular edema less common following extracapsular cataract extraction? These are among the hundreds of still unanswered questions. They are unanswered because the surgeon has not brought to his craft the lessons of the technological revolution. Clinical impres-