

HANDBOOK OF PLASTIC SURGERY

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WILLIAMS & WILKINS
Baltimore/London

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Williams & Wilkins
428 East Preston Street
Baltimore, MD 21202, U.S.A.

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Made in the United States of America

Library of Congress Cataloging in Publication Data

McKinney, Peter.

Handbook of plastic surgery.

Bibliography: p.
Includes index.

1. Surgery, Plastic. I. Cunningham, Bruce Langdon. II. Title.
RD118.M44 617'.95 81-3383
ISBN 0-683-05865-7 AACR2

Composed and printed at the
Waverly Press, Inc.
Mt. Royal and Guilford Aves.
Baltimore, MD 21202, U.S.A.

**Handbook of
PLASTIC SURGERY**

DEDICATION

To our students and colleagues

Foreword

The origins of plastic surgery are lost in antiquity. But at least some of the techniques that are employed today, and certainly some of the basic principles, were known and used hundreds and perhaps even thousands of years ago. Our understanding and application of them have expanded over the years, and our success with them has increased with refinements in technique and advances in our general medical knowledge.

The development of plastic surgery as a distinct specialty within the framework of general surgery, came about during World War I, a mere 65 years ago. Its maturation since then has been a wonder to behold. Likewise, the literature of plastic surgery has grown exponentially from occasional scattered articles and books now and then, to a vast library of reference works, sets of principles, scientific reports, recitations of clinical experiences and technical manuals. All of these have value and utility, but their volume, diversity and, at times inaccessibility can be distressing to the student or practitioner who wants an easily understood introduction to the field and a handy guide to everyday clinical problems. The *Handbook of Plastic Surgery* will serve this function.

It is especially pleasant for me to see this book come from the thought and hands of my esteemed associate of many years, who has earned for himself a respected place in plastic surgery, and one of our former residents whose future in our specialty we view with great expectations. Their sound understanding of this subject and the clarity of its presentation make this a volume with great practical value for students and practitioners in many fields of surgery.

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Chicago 1981

Preface

Few clinical fields have expanded as rapidly as plastic and reconstructive surgery. Advances in technology and increased sophistication in the application of the basic sciences to clinical work have so broadened the specialty that the body of available information has become immense. The authors believe that a fundamental guide which presents and analyzes the basic principles of plastic and reconstructive surgery can help to catalogue this information. It is a mastery of the underlying concepts, rather than a rote memorization of facts, that will assist younger surgeons in developing their clinical skills.

Many excellent textbooks on plastic surgery exist, but most of them are designed for surgeons already working in the field. These publications contain more technical detail than is appropriate for medical students or for members of the surgical house staff rotating on the Plastic Surgery Service. This book is designed for those groups, as well as for physicians in other fields who want a working knowledge of plastic and reconstructive surgery in order to assist them in the management of emergencies or elective incisions, or in counseling patients concerning a plastic surgical procedure.

The concepts underlying the book were developed in a large teaching hospital where input from medical students, surgical house staff and academic plastic surgeons was readily available. Many of the concepts were first presented in a series of lectures given by the senior author to medical students at Northwestern University. It is through questions and responses of these students that many of the explanations have been simplified and refined.

The illustrations, all original drawings commissioned for this work, are designed to clarify and extend many of the principles developed in the text.

Peter McKinney, M.D., F.A.C.S.
Bruce L. Cunningham, M.D.

Spring 1981

Introduction

To obtain maximum benefit from this book, the reader should take the time to thoroughly digest, in a leisurely manner, Section I, Basic Concepts (Chapters 1 through 7) before proceeding to Section II, Clinical Entities (Chapters 8 through 16). In Section I the authors have spared the reader the burden of having to memorize endless detailed data by presenting instead a core of information embodying the basic concepts applicable to all forms of plastic and reconstructive surgery. In spite of our lifting that burden, understanding the concepts presented here will require a certain amount of time and effort, but the rewards will far outweigh the initial investment.

In plastic surgery the technical details vary for each surgical procedure, yet every operation adheres to the same basic principles. The careful reader will come to appreciate that fact when he approaches the second section of the book and comes to see that each specific procedure follows, in its own way, the basic concepts outlined in Section I.

The second section provides basic information that physicians in other fields can apply to their own specialties. For example, the portion of Chapter 9 outlining current concepts and techniques in breast reconstruction contains information of value to the surgeon who performs mastectomies, as do the paragraphs on the current controversy over subcutaneous mastectomy. For emergency room physicians, Section II provides information which will assist in the management of fractures and lacerations.

Chapter 1, History and Scope, was included to give the reader a historical perspective on modern techniques. This is especially important in the field of plastic surgery because many of the original ideas have been lost and later rediscovered.

Chapter 2, Legal Aspects, could go anywhere (preferably to congressional reform). It is included because it is important that the reader have some

working knowledge of the present system as it affects the surgeon.

Logically, the part of Chapter 8 on the psychological aspects of patient selection should be included under Basic Concepts rather than under Clinical Entities. It was placed in the chapter on aesthetic surgery because most pertinent psychological studies have been limited to the psychology of patients seeking such surgery. However, the authors cannot emphasize too strongly that the personality types described in that chapter apply to all plastic surgery patients, and an understanding of the personality differences involved and how to handle them will make for a happier physician/patient relationship.

The illustrations are designed to augment the text and are placed as close as possible to the corresponding references.

A bibliography has not been included because isolated ideas, or ideas supported by only one or two authors, have been generally avoided. The authors have attempted instead to present facts on which there is a consensus. A reading list has been provided for those seeking more detailed information in specific areas.

Acknowledgments

From the time this book was in the planning stage, the authors believed that quality artwork would be crucial to the clarity of the text. We are indebted to Sandra Koperski, A.M.I., who spent many hours in research and execution of the illustrations.

Thanks also to Paula Hamilton and Associates, especially Elizabeth Aulenbach, editor, and Sharon Bierman, word processing specialist, for preparation of the manuscript.

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I. Basic Concepts

CHAPTER 1

History and Scope

The word "plastic" is derived from the Greek word "plastikos" which means "fit for molding." Although von Graefe wrote *Rhinoplastik* in 1818, application of the term to medicine has been attributed to Zeis who published *Handbuch der Plastischen Chirurgia* in 1838. He used the term to signify the ability of the surgeon to mold and refashion parts misshapen by disease or injury.

Early Beginnings

Although the term "plastic surgery" is relatively recent, the concept is not. Modern techniques of plastic surgery are rooted in thousands of years of medicine. The earliest known surgery dates from 10,000 B.C. when the Peruvians performed the first craniotomy by creating burn holes. While the reason for this practice is unclear, the technique resembles methods used today to treat subdural hematoma. New bone formation found in these ancient skulls gives evidence of some of those patients surviving. Reconstructive surgery dates from 1,000 B.C. in ancient India where members of the tilemaker caste reconstructed noses and ear lobes lost in battle. This method was described by Hindu surgeon Susruta around 400 B.C. He employed cheek tissue to replace nasal tips and ear lobes. Repair of cleft lips was described by the Chinese of the Chin dynasty (229-317 A.D.). The famous Persian physician Rhazes described the use of animal gut for ligatures in 900 A.D., although the use of ligatures was suggested by Celsus (circa 25 B.C.-50 A.D.), a Roman, many years earlier.

The practice of medicine spread from India to China and westward through Arabia and Egypt to Europe. Celsus (who, incidentally, was not a physician) discussed reconstructive surgery of the face in his eight-book work entitled *De Re Medicina*. The hemostats used today are not unlike those invented by the Romans of Celsus' time, who had a variety of sophisticated

instruments.

In 15th Century Europe, there were reports of nasal reconstructions using arm flaps. This method came to be known as the Italian method because it was popularized by Tagliacozzi of Bologna. He published the first textbook of plastic surgery in 1597 with his *De Curtorum Chirurgia* (Fig. 1-1).

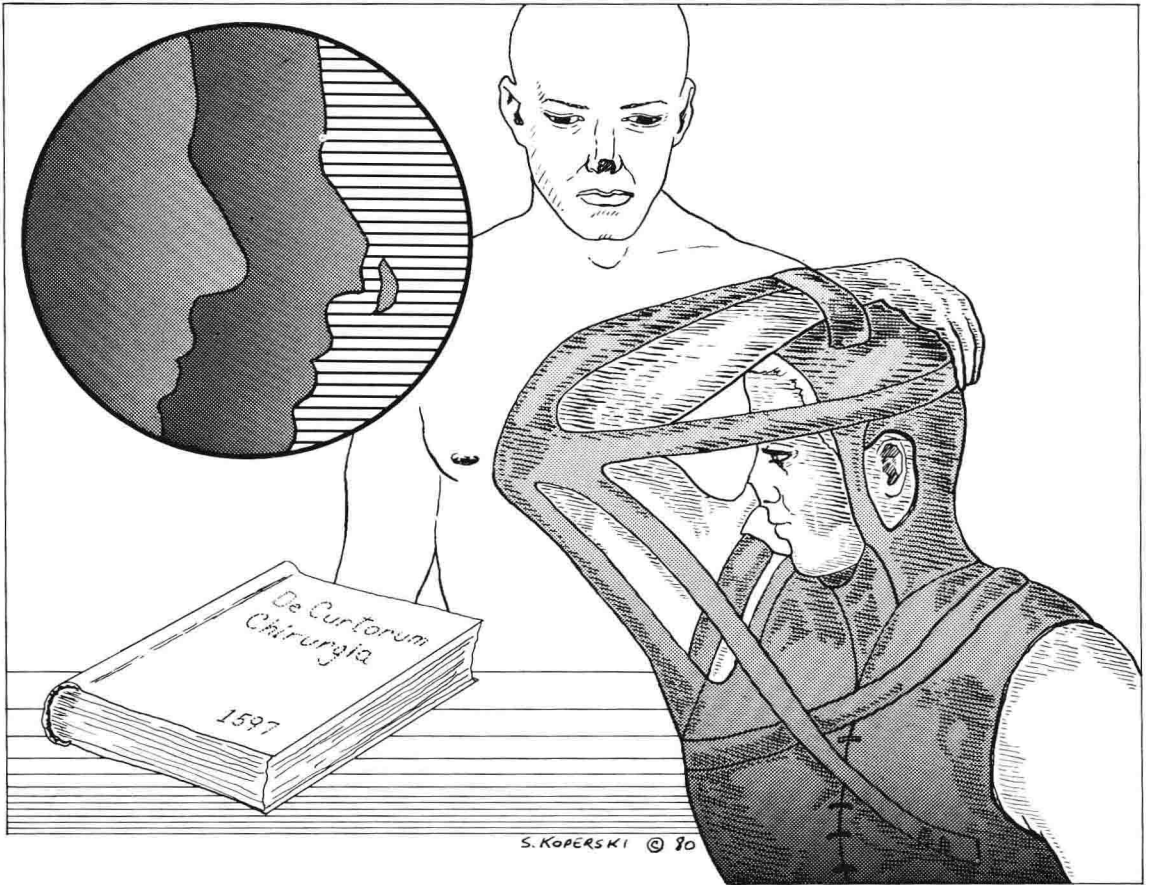


Figure 1-1. **Tagliacozzi's technique of nasal reconstruction.** This method utilized arm tissue and incorporated an ingenious device for immobilizing the arm.

Plastic and reconstructive surgery have not always been eagerly accepted. Although Tagliacozzi's work was in response to a common need (nasal tips were frequently injured in sword fights), it did meet fierce resistance from the powerful church. Tagliacozzi's remains were said to have been exhumed and moved to unconsecrated ground because his work "meddled with the will of God."

The church was not alone in its opposition to reconstructive surgery. The French satirist Voltaire ridiculed Tagliacozzi in a poem, and even Paré, who introduced modern wound care, criticized the surgeon from Bologna.

This same resistance to progress prompted reversal of the first known bone graft for skull reconstruction. In 1668, Van Meekren reconstructed a soldier's defective skull with a bone from a dog's skull. The resultant outcry from the church forced removal of the bone and, ironically, prevented the inevitable failure of this xenograft reconstruction.

Some of these feelings still abound today, especially regarding aesthetic surgery. Actually, Tagliacozzi probably performed the first aesthetic rhinoplasty, albeit for functional purposes. A famous duke had a prominent nasal hump which obscured his vision on that side. Tagliacozzi removed the hump, restoring peripheral vision.

A common punishment for adultery in 18th Century India was the amputation of the nose. Accidental injury to the nose, therefore, was associated with considerable social stigma. In 1794, the *Gentleman's Magazine* published a report of a nasal reconstruction using the skin of the forehead. This technique is still considered one of the best for nasal reconstruction.

In the late 18th and early 19th Centuries surgical activity increased, prompted by the need generated by the military campaigns of the day. Jones introduced techniques of plastic surgery to the American colonies with the publication of his *Plain, Concise Practical Remarks on the Treatments of Wounds and Fractures* in 1775. This was timely information as the Revolutionary War erupted one year later and the book became the military surgeon's bible.

Progress in solving many problems of plastic surgery progressed rapidly. Von Graefe of Berlin performed the first blepharoplasty in 1809. Mettauer of Virginia was the first to repair the soft palate in 1827; and Warren of Boston performed the first hard palate repair in 1843.

Basic plastic surgical research began with Baronio in 1804. He had heard scattered reports of the clinical application of skin grafts in India. He used sheep as a model to experiment with such grafts, discovering that only autografts survived. It is possible that this information was put to use by Bunger in 1823 when he did the first modern skin graft (Fig. 1-2).

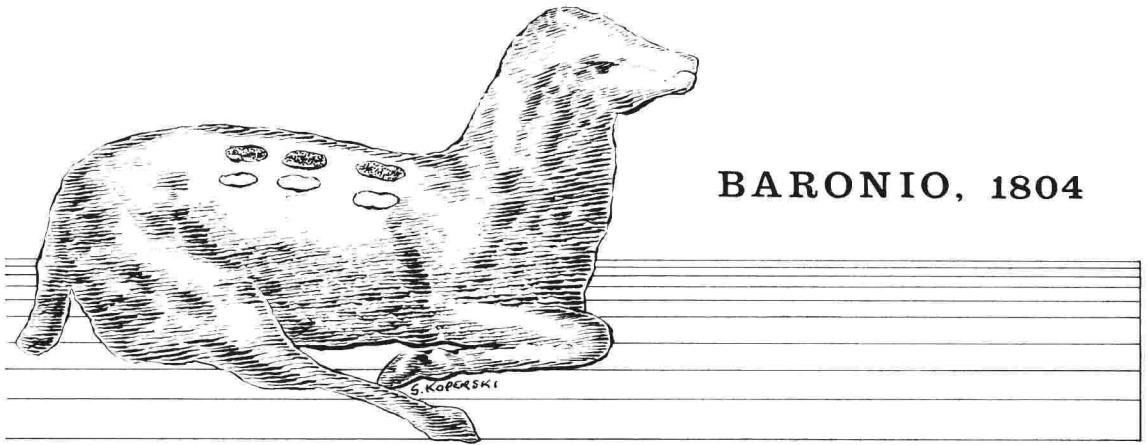


Figure 1-2. **Baronio, in 1804, utilized sheep for the first experiments with skin grafts.** The white grafts from the sheep shown here did survive, a tribute to the principle of autogenous skin grafting. The black grafts are allografts from another sheep and did not survive.

Further advances were made in 1869 when an intern in Paris applied thin sheets of skin to a granulating wound, with subsequent closure of the lesion. This became known as the Reverdin graft in honor of the man who first performed it. Later, thicker, larger grafts were used by Ollier and Thiersch. Wolfe of Glasgow performed the first known full thickness skin graft in 1876, although the ancient surgeons of India had probably used these methods.

Earlier in the 19th Century, Dupuytren (1784-1840) created a classification of burns that we still use today. He also described a contracture of the palm of a hand which bears his name. Hamilton of Buffalo, New York, described a cross leg flap to cover an open fracture of the leg in the mid-19th Century (Fig. 1-3).