# Reconstruction of the Head and Neck

Malcolm A. Lesavoy, M.D.

# RECONSTRUCTION OF THE HEAD AND NECK

*Edited by*

**Malcolm A. Lesavoy M.D., F.A.C.S.**

Assistant Professor of Surgery
Division of Plastic Surgery
U.C.L.A. School of Medicine
Los Angeles, California

Chief, Plastic and Reconstructive Surgery
Harbor General Hospital
Torrance, California

Chief, Plastic and Reconstructive Surgery
Long Beach General Hospital
Long Beach, California




WILLIAMS & WILKINS
Baltimore/London

*Made in the United States of America*

Library of Congress Cataloging in Publication Data

Main entry under title:

Reconstruction of the head and neck.

Includes index.
1. Head—Surgery. 2. Neck—Surgery. 3. Surgery, Plastic. I. Lesavoy, Malcolm A.
RD521.R42 617'51 79-24352
ISBN 0-683-04949-6

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

DEDICATION

*To my wife, Jeannie, and my children, Brian, Jordan, and Nikki*
*for their love, devotion, patience and support.*

*Malcolm A. Lesavoy, M.D., F.A.C.S.*

# *PREFACE*

This book is designed to elucidate the basic principles and techniques of reconstruction of the head and neck region. It is not meant to be a "how to do it" textbook. It is meant to scratch the surface and illustrate to the reader a number of ways of attacking a particular problem. It is by no means a definitive and "only way" textbook. It is meant to pique and stimulate the readers' imagination toward newer and better ways of reconstruction.

Any textbook on plastic and reconstructive surgery can never be definitive. Various other textbooks already published deal with similar problems. This textbook attempts to deal with construction of parts of the human anatomy above the clavicles in a segmental fashion. One has to constantly keep in mind, however, that although various parts of our body are segmental in nature, everything is connected. One cannot contemplate plastic and reconstructive procedures on the "head bone" without considering the "neck bone" to which it is connected.

Reconstructive surgery is a constantly changing field. Newer techniques of microvascular reconstruction and recent advances in the repair and reconstruction of craniofacial anomalies have given plastic and reconstructive surgeons new outlooks for tackling functional and cosmetic parts of our anatomy.

It is with utmost humility that the editor and contributing authors offer this book for use by practicing physicians, residents, interns and medical students interested in imagination in reconstructive surgery.

# *CONTRIBUTORS*


**Thomas C. Calcaterra, M.D., F.A.C.S.**
*Professor of Surgery*
*Division of Head and Neck Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**Andrew E. Choy, M.D.**
*Clinical Instructor*
*Department of Ophthalmology*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**Rollin K. Daniel, M.D., F.R.C.S.(C)**
*Chief, Division of Plastic Surgery*
*Royal Victoria Hospital*
*Montreal, Canada*
*Associate Professor of Surgery*
*McGill University School of Medicine*
*Montreal, Canada*

**Frederick R. Eilber, M.D., F.A.C.S.**
*Professor of Surgery*
*Division of Oncology*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**Henry K. Kawamoto, Jr., M.D., D.D.S.**
*Acting Chief*
*Division of Plastic Surgery*
*Sepulveda Veteran's Administration Hospital*
*Sepulveda, California*
*Assistant Clinical Professor*
*Division of Plastic Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**Malcolm A. Lesavoy, M.D., F.A.C.S.**
*Assistant Professor of Surgery*
*Division of Plastic Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*
*Chief, Plastic and Reconstructive Surgery*
*Harbor General Hospital*
*Torrance, California*
*Chief, Plastic and Reconstructive Surgery*
*Long Beach General Hospital*
*Long Beach, California*

**John William Little III, M.D.**
*Assistant Professor of Surgery (Plastic)*
*and Director,*
*Division of Plastic and Reconstructive Surgery,*
*Georgetown University Medical School*
*Consultant in Plastic Surgery,*
*the National Cancer Institute,*
*National Institutes of Health,*
*Washington, D.C.*

**Timothy A. Miller, M.D., F.A.C.S.**
*Chief, Plastic and Reconstructive Surgery*
*Wadsworth Veteran's Administration Hospital*
*Los Angeles, California*
*Associate Professor of Surgery*
*Division of Plastic Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**Walter R. Mullin, M.D.**
*Clinical Assistant Professor*
*Division of Plastic Surgery*
*University of Miami School of Medicine*
*Miami, Florida*

**Jon A. Perlman, M.D.**
*Chief Resident in Plastic Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**F. Kristian Storm III, M.D., F.A.C.S.**
*Assistant Professor of Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

**S. Anthony Wolfe, M.D., F.A.C.S.**
*Clinical Associate Professor*
*Division of Plastic Surgery*
*University of Miami School of Medicine*
*Miami, Florida*

**Harvey A. Zarem, M.D., F.A.C.S.**
*Professor and Chief*
*Division of Plastic Surgery*
*U.C.L.A. School of Medicine*
*Los Angeles, California*

# *ACKNOWLEDGMENTS*

No medical textbook can be written alone. Aside from the numerous contributing authors that appear in print, many extremely important people behind the scenes carry out the tasks that make the completion of a book successful. It is here that the editor and contributing authors would like to acknowledge secretaries, medical illustrators, patients, medical students and residents, and family that have enabled thought and hard work to come to fruition.

I would personally like to acknowledge the long hours and tremendous work contributed by Mrs. Patty Lindsly, Mrs. Juanita Navarette, and Mrs. Janet Lewis. Their collation, typing, efficiency, and patience contributed greatly to the successful completion of this book. I would also like to thank Mrs. Hermina Kavanah for her excellent medical illustrations and her professional expertise in being able to put on paper what is in one's mind.

I would like to thank our residents and medical students who constantly stimulate our minds to deeper thought, our patients who allow us to care for them tenderly, but efficiently, for relief of disease, pain, and disfigurement and who allow us to continue to learn.

Gratitude and acknowledgment must be given to Mrs. Susan Vitalle and Mr. George Stamathis of Williams & Wilkins. Their cooperation, professional expertise, and consistent patience have made the publishing of this book a true cooperative venture.

Finally, I would like to thank my parents, Harry and Rae Lesavoy, who stimulated and supported my early medical education.

*Malcolm A. Lesavoy, M.D., F.A.C.S.*

# CONTENTS

*CHAPTER 1*

# Evaluation and Examination

**Malcolm A. Lesavoy, M.D., F.A.C.S.**

In any reconstructive problem, evaluation of the deformity by taking the history and doing a physical examination is of utmost importance. One's evaluation is made up of many factors. The reconstructive surgeon must always keep in mind that beauty is definitely not in the eye of the beholder, but in the "beholdee." The patient's needs and desires should be foremost in the surgeon's mind, not the reverse. Many an experienced plastic and reconstructive surgeon has entered the examining room for initial consultation with a patient and is confronted with the visual impact of a large nose. The first words out of his mouth are, "Mrs. Jones, I am Doctor Smith, and I'll be glad to take care of you and correct your nasal deformity." Mrs. Jones then replies, "Doctor Smith, what is wrong with my nose? I think it is quite nice, as does my husband. It is the small mole that I have behind my ear that I would like removed." This principle is then re-enforced to the surgeon that beauty is not in the eye of the beholder, but in the eye of the "beholdee." The constructive surgeon should spend large portions of time conversing with his patient so that information can be gained about his patient's wants, desires, and expectations. This is the appropriate time for elucidating a patient's possible unrealistic wants on how he or she will look after the "magic restorative surgery."

It is important to stress to the patient differences between function and cosmesis. There has to be a marriage between these two factors in any discussion of facial reconstruction. The patient must understand that a surgeon should never jeopardize function for cosmesis. A sunken and enophthalmic globe can be improved and better symmetry attained with the contralateral normal globe, but the procedures are limited by good functioning extrinsic muscles and a somewhat chronically contracted and fibrosed optic nerve of the affected eye. The patient must completely understand the anatomical limitations and become an active and participating member in the restorative process.

The discussion with the patient preoperatively will save heartaches on both sides of the operative scalpel postoperatively. If patients are fully aware of their particular deformity and taking an active role in planning and understanding of the staged reconstructive procedures, they will then have realistic and satisfied results. The day of the doctor saying, "Don't worry Mrs. Jones, I understand the problem, so leave everything in my hands and I'll take care of it," is long gone. The patient should be considered sophisticated, intelligent, and should be given the opportunity to take an active part in their own care.

## PRINCIPLES

As in anything in life, there are certain rules and regulations one must live by. In this relatively new field of plastic and reconstructive surgery, some principles of care have been elucidated by the father of modern plastic surgery, Sir Harold Gillies. These principles have subsequently been documented, expanded, and flourished by one of his disciples, D. Ralph Millard, Jr., one of the most prolific and imaginitive surgeons in the last few decades. A recounting of these principles as described by Gillies and Millard in their book, *The Principles and Art of Plastic Surgery* should be read and applied by all who cherish plastic surgery. Overemphasis of these principles cannot be done and a recapitulation is definitely in order. The first principle and most basic is "observation is the basis of surgical diagnosis." The surgeon must observe and look, not just with his eyes, but with his mind. He must observe, not just his patients, but patients of other surgeons, and learn from past and present mistakes. Another part of this "observation principle" is to "know the normal."

To "know the normal" is not an easy task. All human faces have two eyes, two ears, one nose, two nostrils, one mouth, etc. Understanding the relationship of these structures to one another and to themselves is something that requires great study. Once the normal is known, the next principle can then be delineated.

The second principle of Gillies and Millard is "diagnose before you treat." This can have many ramifications, however, basically one must determine what the true defect is. Looks are definitely deceiving, and an apparent small defect can be converted into a much larger, truer defect when this principle is appreciated.

Once the true defect is found, the third principle of "making a plan and a pattern for this plan" can apply. To exercise one's gray matter and to mentate to make a plan is one of the greatest intellectual challenges and stimulations one has in reconstructive surgery.

The fourth and fifth principles are "documentation," and "the life boat." Obviously, without good record-keeping, preoperative photographs, appropriate sketches and diagrams, one's fantastic ideas, and moments of genius will be past and forgotten once the flap settles. We must learn by successes as well as failures, therefore, documentation is of utmost importance. Most importantly, one plan is not enough, one must have a number of plans preoperatively, so that various "life boats" can be used if so needed. The sixth principle of "good style" can only be appreciated if one pays attention to details, applies principles of surgery to the gentleness and dexterity of handling tissue.

Seventh, and high in priority in this order of principles is, "replace what is normal in normal position and retain it there." Healthy wounds heal by scar contracture and normal structures can be shifted and transposed by the mighty myofibroblast. In time, this action can be used to the patient's benefit, but after severe traumatic deformities, normal tissue can be displaced from their normal anatomic positions, and the true defect subsequently masked prior to soft tissue or bony reconstruction. The visions of one's plan should be made to retain the new transposed normal tissue in its normal position, otherwise, this tissue will migrate back to its abnormal home.

The next principles laid down by Gillies, and enumerated by Millard, were to "treat the primary defect first," and to "borrow from Peter to pay Paul, only when Peter can afford it." One should not be unnecessarily concerned with a secondary defect, but keep in mind the main goal and mission of the reconstructive exercise. The patient is in need of reconstruction of a particular organ, and if the secondary defect is acceptable after transposition of tissue to the primary site, go for it. Add to this the ninth principle of "losses must be replaced in kind." An example is that thin ruberous skin should be replaced with similar skin. Obviously, to the contrary, thin ruberous skin should not be used to reconstruct thick pale skin. The principle of "never throwing anything away," is an extremely important one and emphasizes that every

little bit counts and can be used at sometime during any particular reconstruction. There always is a piece of tissue that had been excised and thrown away, but later on was needed and could have been used as the final piece of the puzzle. A plastic surgeon's mind must always remain young and "never let routine methods become your master": a rule we should all keep in mind. One should never "always" do a particular procedure one way or the other. Being stuck in a rut is when the imaginative mind falters. Having the constant stimulation of new tracks or new procedures, is limited only by one's imagination. It does not mean, however, that if a particular procedure has worked satisfactorily in a similar case, that it should not be tried again. The second time it is done, efforts should be made to improve that same procedure.

"Consulting other specialists," as suggested by Gillies and Millard, can be most helpful. Discussing procedures and problems with colleagues can pique interest and stimulate further imagination. Using a colleague's mind as a sounding board can be most productive. Finally, "never do today what can honorably be put off till tommorow": scars in need of revising, flaps in need of thinning, and defects to be reconstructed. Tincture of time will heal and soften many wounds, and the more of this tincture, the better the stage is set for further reconstruction. The surgeon who is interested and compulsive, always striving for perfection, and who pays great attention to detail, will never be finished with any particular reconstructive case. That surgeon will always be wanting to "thin this" or "defat that" and eventually will come close to the ideal.

## PHYSICAL EXAMINATION

Once a historical recounting of the particular problem by the patient has been accomplished and the principles of plastic and reconstructive surgery understood, one must then lose all abandon and examine the patient. In the examination of the face, one should concentrate on the particular defect at hand after all other normal structures are inspected and examined. Underlying bony structures of the neck, face, and skull can be easily palpated. Almost the entire inferior border of the mandible can be felt for deformity. Intraoral examination for masses and abnormalities is extremely important and bimanual palpation can easily be done. Occlusal relationships of the mandibular to the maxillary teeth are important to document and understand. The relationship between the two jaws is the key to the underlying facial bony contour. For that reason, an understanding of dental occlusion should be accomplished. Functional movement of the mandible should be examined in all six positions: opened, closed, right and left lateral movement, anterior projection, and posterior projection.

Observation and palpation of symmetry of both malar bones and their confluent zygomatic arches should be made. Similar palpation of the infraorbital rim under the thin lower eyelid skin should also be done as well as the lateral and superior orbital margins, visual acuity, and extraocular movements of both eyes. Palpation of the nasal bones along with their cartilaginous extensions should also be made. Intranasal examination for septal deviations, nasal polyps, tubinate hypertrophies, or assymmetries should be noted.

Examinations of the soft tissue of the face and neck are relatively self-explanatory. Knowledge of "knowing the normal" comes from experience and close observation. Basic courses in sculpturing or line drawing are most helpful to a surgeon's powers of true meaningful observation.

If the particular reconstructive problem involves underlying bony structures, x-rays can add to one's basic information. It is not the purpose of this chapter to elucidate the 15 or 20 various types of facial and skull x-rays. These can be gathered from any number of other textbooks, however a few selected x-rays are most often used. A posterior, anterior, and lateral

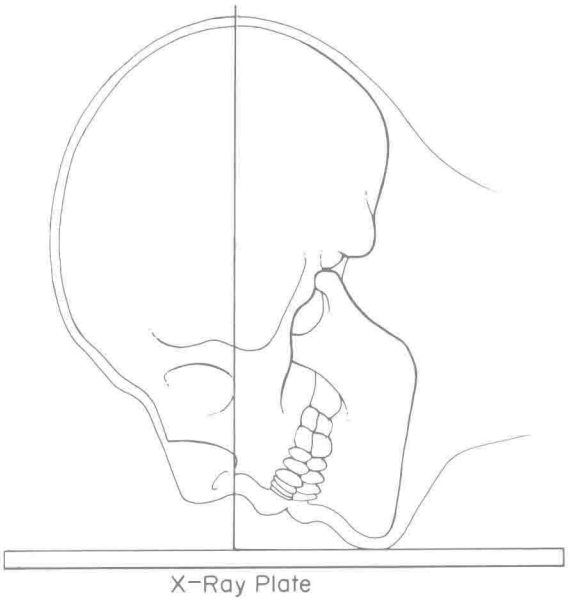


**Figure 1.1** Waters' view—the face is placed on the x-ray plate so that the mastoid process and mandibular condyles are shifted out of the x-ray path; thus, the maxillary sinus and inferior orbital rim can easily be seen.

view of the face, along with a Waters' view (Fig. 1.1) are ostensibly the main x-rays from which one gleans the most basic information. One should constantly keep in mind that the facial bones are membranous in structure and heal by fibrous union. Previous osteotomies or prior fractures can be seen on x-rays for many years. Facial bones do not heal by callus formation as do the long bones of our anatomy. This is quite fortunate, because it would be difficult to imagine a large callus forming in an orbital floor fracture. A large callus in this region would not only hamper the extrinsic muscles of the eye, but may increase the intraorbital pressure by decreasing the intraorbital volume and cause severe functional impairment on the globe. Aside from this near disastrous sequela on the eye, a terrible cosmetic deformity would result. Teleologically the good Lord figured this out quite well. For functional weight bearing the long bone fractures produce bulky calluses contrary to a lack of bulk in the fibrous union of the much more delicate facial bones.

The recent use of computerized axial tomography (CAT) scans has also been helpful in evaluation of various congenital and traumatic bony deformities. The use of CAT scans and cephalometrograms can be extremely helpful in the annual monitoring and documentation of growth in congenital deformities of the skull and face. The results from Panorex x-rays for mandibular deformities is unparalleled, but these have limitation at the temporomandibular joint areas, which can be separately viewed if so desired on special projections.

## PLAN

Once appropriate history, physical examination and x-rays are accomplished, a diagnosis of the defect has to be made. This is not always easily done. One has to determine whether there is an underlying bony defect, and overlying soft tissue defect, or both. It is not always necessary or desirable to return normal bony tissue to its normal position if the functional occlusion is satisfactory. There are, therefore, exceptions to the rules and principles of Gillies and Millard. An example is a patient who had a traumatic LeFort III fracture (suffered by being stepped on by a bull) and has had two or three reconstructive procedures at outside hospitals to

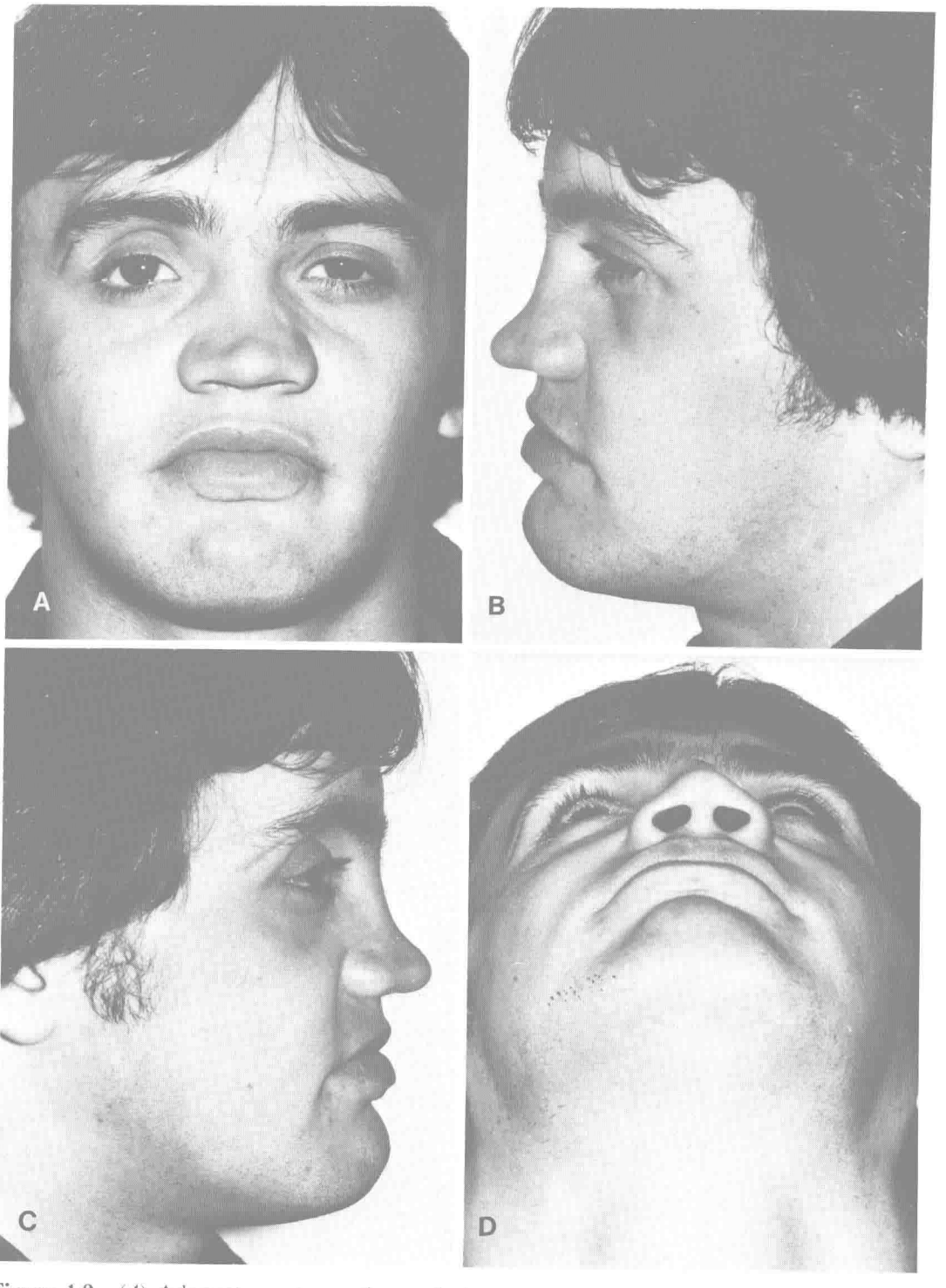


**Figure 1.2** (*A*) Adequate postoperative occlusion status post-traumatic LeFort III fracture with unsatisfactory facial contour—frontal view, (*B*) left lateral, (*C*) right lateral, and (*D*) mental view.

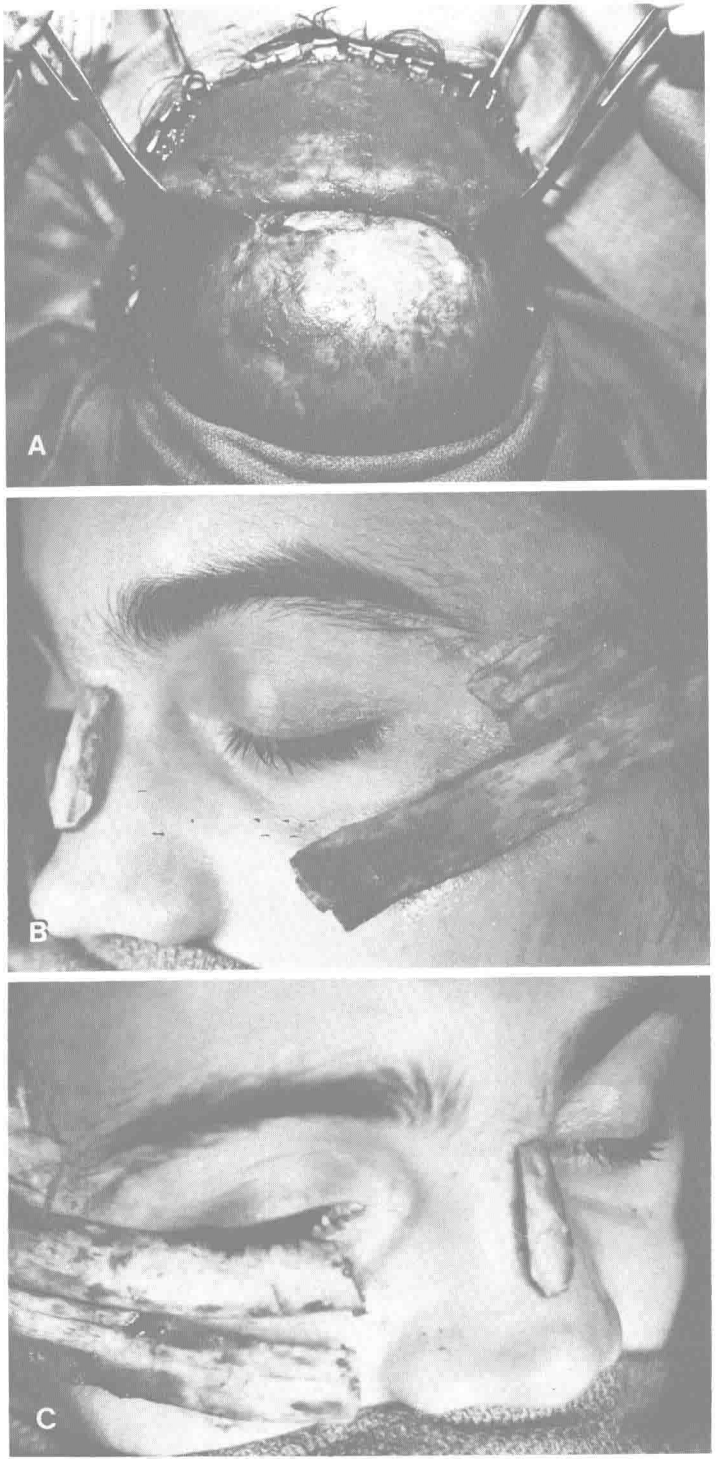


**Figure 1.3** (*A*) Bicoronal flap is elevated for easy access. (*B*) Split autogenous rib grafts on left lateral. (*C*) right lateral views.

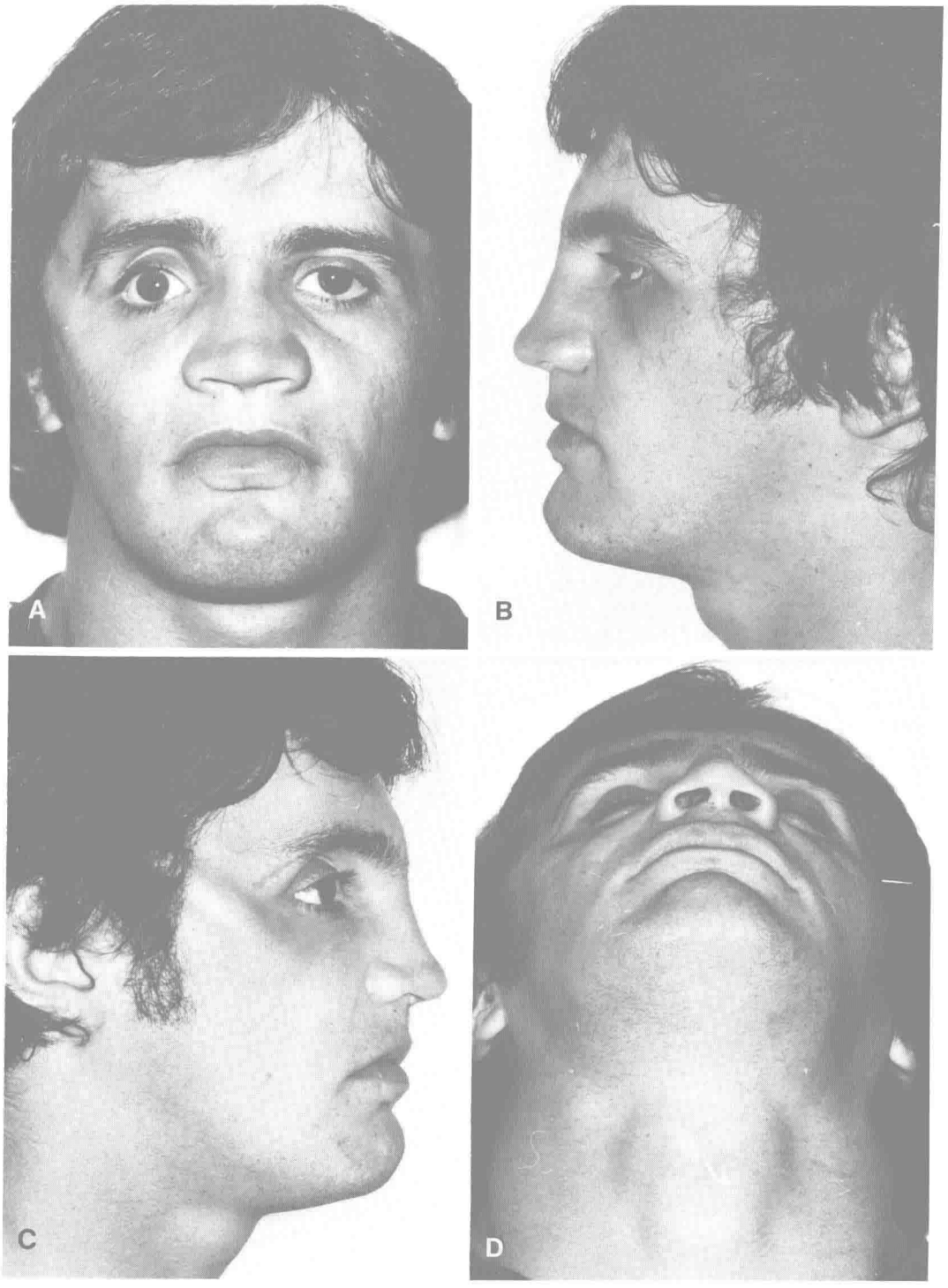


**Figure 1.4** (*A*) Status post autogenous rib grafts through bicoronal approach—frontal view. Revision of right anophthalmic-enophthalmic global prosthesis is planned. (*B*) Left lateral, (*C*) right lateral, and (*D*) mental view.