GENERAL SURGERY THERAPY

OLIVER H. BEAHRS, M.D., Editor
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Foreword

A surgeon has only to remember the time he started his training to become aware of the constant changes taking place in the field of surgery. In some areas, this change has been rapid and extensive, while in others it has been far less dramatic. It is true that pathologic processes have altered very little, and that operative techniques for many procedures are well established. Even for such diseases, however, incidence rates may increase or decrease markedly, and innovative methods of diagnosis may become available, with preoperative and postoperative management reflecting these new procedures. In other areas—such as craniofacial or peptic-ulcer surgery—new operative techniques are being introduced for both traumatic and elective conditions. Continuing evaluation of various methods proposed to treat the same disease process, such as thyroid cancer, ultimately leads to final acceptance of a particular operation as the procedure of choice.

Not only will the practicing surgeon find this volume valuable in his daily work, but the younger surgical resident and even the medical student interested in surgery will benefit from this complete, authoritative discussion of many common problems encountered in general surgery. Dr. Beahrs has selected a remarkable list of important topics for presentation, each of which is discussed by a widely recognized authority with extensive clinical experience. Each chapter presents a concise, lucid, and practical discussion of pathology, special diagnostic procedures, and preoperative evaluation and preparation. The actual surgical management of each disease is emphasized with a step-by-step description of surgical techniques, supplemented with numerous clear drawings and photographs of the operation as conducted by an expert. The chapters on vascular surgery by Bernatz and Lofgren, and on surgery of the biliary tract, liver, pancreas, and spleen by Braasch, are excellent examples of this complete presentation.

Some of the new surgical techniques discussed—for example, the extensive craniofacial reconstructions discussed in Dr. John Woods's chapter—should be performed only by experienced, specialized teams with extensive support services. Every well-read general surgeon should nonetheless know about these procedures and be capable of discussing them with his patients and their families. In certain unresolved or even controversial areas, each surgeon must select the treatment that he believes will provide his patients with optimal results. Such decisions must be based on a comprehensive store of information—obtained not only from personal experience but also from the work of those with expertise in special fields. Some of these as yet unresolved issues include (1) how one should manage hyperparathyroidism when it is difficult to ascertain if an adenoma or a hyperplasia is involved (discussed herein by Drs. Block and Cerny); (2) when an operation for hiatal hernia should be performed and what constitutes the best type of repair (presented by Drs. Hill and Anderson); (3) how extensively carcinoma of the breast should be excised (reviewed by Dr. Urban); and (4) whether a perforated duodenal ulcer should be treated by suture alone, by suture plus vagotomy, or by resection (delineated by Dr. Jordan).

The discussions by Drs. Beahrs and Wilson dealing with surgery of the lower intestinal tract, by Drs. Pickleman and Freeark on the acute surgical abdomen, by Dr. McVay on inguinal and femoral hernias, by Drs. Peterson and Pruitt on the surgical treatment of burns, and by Drs. Wilson and Walt on shock are universally comprehensive, lucid, and practical presentations by the most experienced sur-

geons in their respective specialties in America. Finally, the chapter by Drs. Cruse and McPhedran reviews common postoperative complications with which all surgeons must contend from time to time.

General surgeons of all degrees of experience will find this volume a most valuable addition to their private libraries—both for obtaining general information on surgical management and for use as an up-to-date reference book.

William P. Longmire

Preface

At some point in time and under a diversity of circumstances—for example, just following a surgical procedure, after a clinical diagnosis has been established, or when a pathologist's report becomes available—most physicians have found it necessary to seek the advice or clarification of a colleague on a specific problem of surgical judgment. Some situations are simple and their courses clear-cut; however, in many other circumstances, the issues at hand are highly complex and controversial. It is in these latter instances that the surgeon most often seeks the counsel of an expert who, because of professional interest or work circumstance, has special knowledge regarding the subject in question. *General Surgery Therapy* has been written to help the surgeon in just such circumstances—when he encounters a problem about which he wishes to obtain information or advice before making a decision regarding the proper course to follow.

General Surgery Therapy is not presented as a comprehensive review of surgical subjects, but instead focuses primarily on decision-making information. Although it is assumed that all surgeons have a thorough knowledge of relevant anatomy, physiology, pathology, and surgical techniques, it is also assumed that most require updating on new information regarding biologic behavior of disease, on changes in philosophy in surgical management, and on new or improved treatment modalities. Although basic information is included in the various chapters when it is considered appropriate, the volume is *not* intended to serve as an atlas or to present information that is already known to the surgeon.

O. H. B.
R. B.

To answer the demand from surgeons and librarians for a hardcover edition of General Surgery Therapy Update Service, *published originally in loose-leaf format in 1978 and updated semiannually from 1978 through 1980, we offer this updated one-volume edition.*

Contents

Chapter 1

Head and Neck

John E. Woods, MD, PhD

This chapter will present an overview of current management of surgical problems in the area of the head and neck. Advances in the areas of diagnosis, pre- and postoperative management, and more recent ablative, reconstructive, and rehabilitative techniques and aids will be discussed, along with recent developments in combined-modality therapy. These advances will be presented as they relate to congenital, traumatic, and neoplastic disease of the head and neck. Overlap will occur inasmuch as advances in one area may result in considerable spin-off or lateralization to other areas.

As increasingly more complex problems are attacked, the need for the team approach has become increasingly apparent. Perhaps this is best illustrated in two areas of endeavor — evaluation and treatment of craniofacial deformities and treatment of increasingly more extensive malignant disease in patients previously consigned to the category of the hopeless, often without recourse even to palliative therapy. Present approaches in these areas may call for the combined talents of general and plastic surgeons, orthodontists, otorhinolaryngologists, neurosurgeons, ophthalmologists, radiologists, anesthesiologists, speech pathologists, and members of the psychosocial disciplines. Even the most broadly trained head and neck surgeon finds it impossible to encompass all facets of diagnosis and management in his armamentarium because of the tremendous body of knowledge currently available.

CONGENITAL CONDITIONS

Craniofacial Surgery

The surgical management of congenital conditions has undergone revolutionary changes both in concept and in execution, and thus deserves substantial discussion. Tessier of Paris has made landmark contributions in this area with radical attacks on numerous deformities (1). Among the conditions now undergoing correction are midface stenoses secondary to Crouzon's and Apert's syndromes or to cleft palate deformities, orbital hypertelorism, Treacher Collins syndrome, mandibular and maxillary dysostoses, hemifacial microsomia and lipodystrophy, fibrous dysplasia, ectodermal dysplasia, and temporomandibular ankyloses.

Prior to any surgical approach, each patient must be studied intensively, as outlined by Murray (2). In addition to the usual medical assessments, growth patterns and intellectual development should be evaluated. Ophthalmologic parameters should include measurements of visual acuity, visual fields, color vision, funduscopic examination, eye position, and muscle movement. Senses of taste and smell are also tested.

X-ray studies are extremely important but can be properly interpreted only in relation to the physical and photographic findings. There is no routine radiographic approach. Each individual patient is evaluated according to the presenting condition. In addition to routine plain films, polytomography and cephalometrograms are most useful. Stereographic Water's views are particularly valuable in evaluation of midface stenoses, Treacher Collins syndrome, orbital hypertelorism, hemifacial atrophy, and the hemifacial microsomias.

Tomography is utilized only where necessary to limit the radiation dosage, but may sometimes be accomplished in the frontal, lateral, and basal planes to provide a rather precise three-dimensional outline.

Essential to a logical approach to many conditions is the dental evaluation. Among the more severe deformities, dentition is often distorted because of abnormalities of the skeletal base, with resultant severe malocclusion that is not amenable to conservative orthodontic treatment. For appropriate planning, in addition to full-face photographs, lateral-view cephalometric films and panoramic X rays are indicated. Dental models are made and may be sectioned to predetermine the benefits obtainable by surgery. The stage of dentition may play an important part in determining the optimum time for surgery.

In addition, because of their important role in postoperative fixation, arch bars may be wired in advance to cemented orthodontic bands. These may also be used in subsequent orthodontic adjustments, which are usually carried out only after major operative procedures have been accomplished.

Because of the magnitude and length of major craniofacial procedures, special anesthesia problems may be encountered, and oral or nasal endotracheal tubes are often wired to retain their position. A central venous pressure line and another good venous line are placed in addition to an intraarterial catheter for blood-gas monitoring. When the brain is to be exposed, lumbar spinal fluid and urinary catheter drainage are employed. Steroids and diuretics are utilized for brain volume control. Blood replacement can range up to twice the normal volume, especially in younger patients. Fresh blood or plasma with calcium supplementation is given in addition to banked blood. Anesthetic methods which are commonly employed include induction by Pentothal with subsequent nitrous oxide, muscle relaxants, and narcotics. Mild hypotension is often employed.

Psychosocial assessment is especially important in the case of severe deformities, requiring the involvement of trained psychiatric personnel. Patients with marked deformity are often perceived as retarded because of their appearance, and thus they respond accordingly. With operative correction and appropriate direction, these patients may achieve dramatic increases in intellectual achievement. Needless to say, surgery of such magnitude to correct non-life-threatening conditions is not undertaken lightly. To date, however, the psychological benefits have appeared to justify the risks involved in numerous patients. Whether severely retarded children should undergo such corrective procedures is still very much a subject of debate. Parents and child (when of an appropriate age) must be made aware of the potential risk of major complications in such procedures, including blindness and even death, though the incidence of such complications has generally been very low.

The operative approach has been systematized by Tessier with the objectives of achieving a posterior-anterior movement of the whole facial mass, with the twin purposes of establishing normal dental occlusion and of increasing orbital capacity (1). It has been found that the entire useful orbit can be safely moved transversely, sagittally, or vertically, or in a combination of these directions with the additional movement of rotation. These displacements can be tailored to the individual deformity. In addition to the skeletal alterations, major restorations can be carried out with bone grafting of defects.

Tessier bases this type of treatment on several simple concepts (1):

1. Careful dissections of the periorbital and pericranial regions make all osteotomies and displacements possible without destroying ocular, oculomotor, palpebral, or lacrimal functions.
2. One-stage correction of all malformations and defects of the frontal, facial, and maxillary skeleton is possible.
3. The simplest and safest approach to the orbital roof is intracranial, so long as the dura is undamaged or reparable.
4. It is appropriate to consider orbitocranial and maxillary problems together, because their primary malformations or sequelae often occur simultaneously.
5. Surgical orthopedics of the face may be appropriately considered prior to the achievement of full growth.

Several important aspects should be emphasized in the performance of major craniofacial surgery, such as

advancement of the middle third of the face. The bitemporal incision provides primary exposure but is combined with two long oblique infraorbital incisions and two transoral posterior vestibular incisions. These incisions provide adequate exposure for all the necessary osteotomies and bony alterations. The osteotomies performed include interpterygomaxillary disjunction through the oral route, and malar-step and orbital-floor osteotomies via the infraorbital route. Upper-lateral and lateral-orbital-wall cuts are made in the frontomalar area. In the fronto-naso-orbital area, vertical osteotomies of the medial orbital wall to the floor are carried out, followed by the infrabasal, intercraniofacial, keel-shaped osteotomy (under the cribriform plate). The vomer is the final bony obstacle that is cut.

At this point, if properly accomplished, the osteotomies will allow disjunction and projection of the facial mass with an attempt to achieve an overprojection of 10 mm. The resulting five crevasses — one frontonasal, two frontomalar, and two interpterygomaxillary — must then be maintained by the placement of bone grafts. When the midface is advanced, the relative recession of the frontal area becomes obvious. This defect can be corrected by remodeling with bone grafts. Frontonasal and frontomalar fixation, along with fixation on the malar grafts, is important in prevention of displacement or retrusion of the advantage gained. In addition to interosseal wiring, orthopedic frame appliances are used for this purpose.

After bony remodeling is completed, suture of incisions is carried out to complete the operation. There are, of course, numerous variations in the operative procedures employed. In addition, subsequent complementary operations can be carried out to correct less major deformities.

The complications that may occur can be divided into intraoperative, early postoperative, and late postoperative (2,3). Death is an ever-present possibility in the intraoperative and early postoperative period, but fortunately it is very rare in reported series of experts in the field. Next to death, blindness is the most catastrophic of complications.

Complications occurring during surgery include hemorrhage, cardiac arrest, pneumothorax, and loss of airway control. In most cases these respond to the usual appropriate measures, and with increasing experience they are less frequently encountered.

Early postoperative complications include prolonged cerebral edema, seizures, epidural hematoma, bleeding from iliac donor sites, lacrimal system obstruction, and airway obstruction. Late complications include infections, partial loss of bone grafts by resorption or chronic sequestration, cerebrospinal-fluid leak, loss of position after removal of fixation, residual exophthalmos, and psychological maladjustment.

The results of craniofacial advancement procedures are difficult to assess accurately inasmuch as most authors tend in their publications to present their more fa-

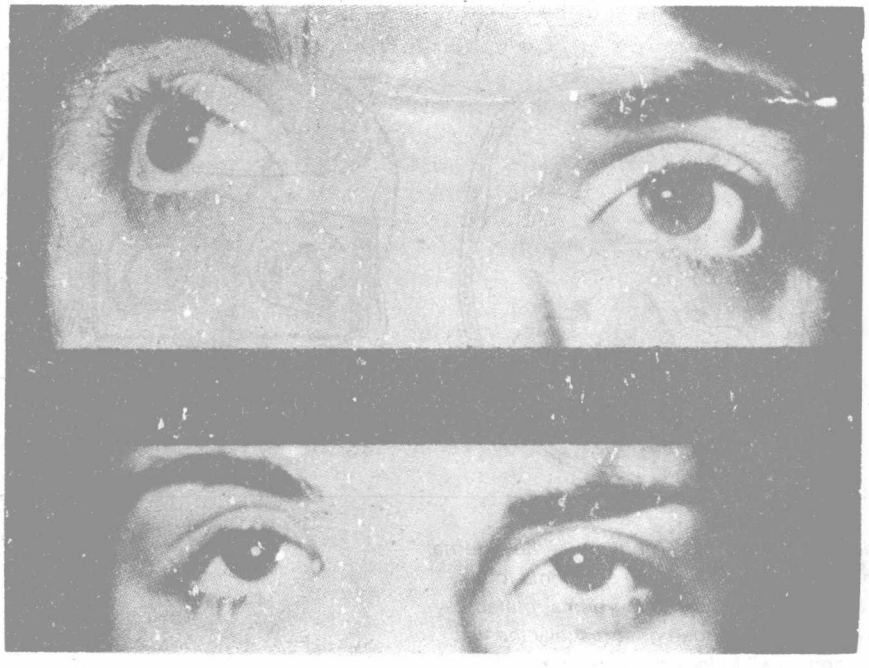

Figure 1
Cranio-orbital correction of orbital hypertelorism-teleorbitism. A composite photograph of a patient with severe hypertelorism in which the orbits were moved medially. The patient had severe exotropia that was corrected with the medial translocation of both orbits. The upper part of the photo is the patient's orbit before the corrective procedure, and the lower part of the photo is the orbit after the corrective procedure. We used the transconjunctival incision for the exposure of the intraorbital region. (Courtesy of Dr. Mutaz Habal, University of Florida, Gainesville.)

vorable results. Certainly some striking improvements have been achieved. One such case is illustrated in Figures 1-4 (courtesy of Dr. Mutaz Habal). It is equally certain that in a very significant proportion of cases, the objective changes are rather minor. As in other types of corrective surgery for severe defects, however, patient or parents are often most grateful for any change for the better, no matter how small. In many instances, the psychological benefits can far outweigh the measurable alterations.

Recently, Edgerton and coworkers suggested that an early approach, even before the completion of skeletal growth, is appropriate in certain types of craniofacial malformations (4). In some instances this would possibly prevent secondary deformities or disturbances in growth. The length of follow-up in a substantial group of patients is insufficient to draw any firm conclusions.

The trend toward earlier performance of craniofacial reconstructive procedures continues. Whitaker has reported results from 40 patients operated on at less than one year of age. One-year follow-up was available on 23 of the 40; 10 of these 23 had been followed for two years. To date there has been no evidence of growth disturbance in these children; growth has followed the normal patterns and complications have been almost non-existent. There have been no deaths and no instances of blindness in this group (4a). Recent work by Munro in young pigs has shown little or no effect on bone growth by Le Fort III-type osteotomies, tending to confirm this clinical impression (4b).

Another interesting application of craniofacial surgery has been the correction of the large and grotesque deformity associated with longstanding untreated hydrocephalus. Habal has reported a 64% reduction of cranial volume in a six year old who had a head circumference of 74 cm; this was accompanied by a loss of over two liters of fluid. This reduction was accomplished by removing the neurocranium in one unit and reducing it to an appropriate size. The two-year follow-up revealed that for the first time the patient was able to hold up his head and wheel his chair to school (4c). An additional outgrowth of craniofacial experience is the increasing utilization of primary treatment of severe craniofacial injuries by a multidisciplinary team. This treatment appears to yield the best possible results (4d).

Cleft Lip and Palate Surgery

Little in the way of striking advance has been made in this area. There is increasing concern on the part of some experts in this field with regard to the late sequelae of early push-back or other more radical corrective procedures for palatal clefts (5). Midface retrusion and malocclusion have been attributed to the disturbance of maxillary blood supply by such procedures performed early. As a consequence, closure of the soft palate only, at one and one-half to two years by conservative palatoplasty, has been advocated by some, along with correction of the bony palatal defects at a later date. Opponents of this view feel that development of abnormal

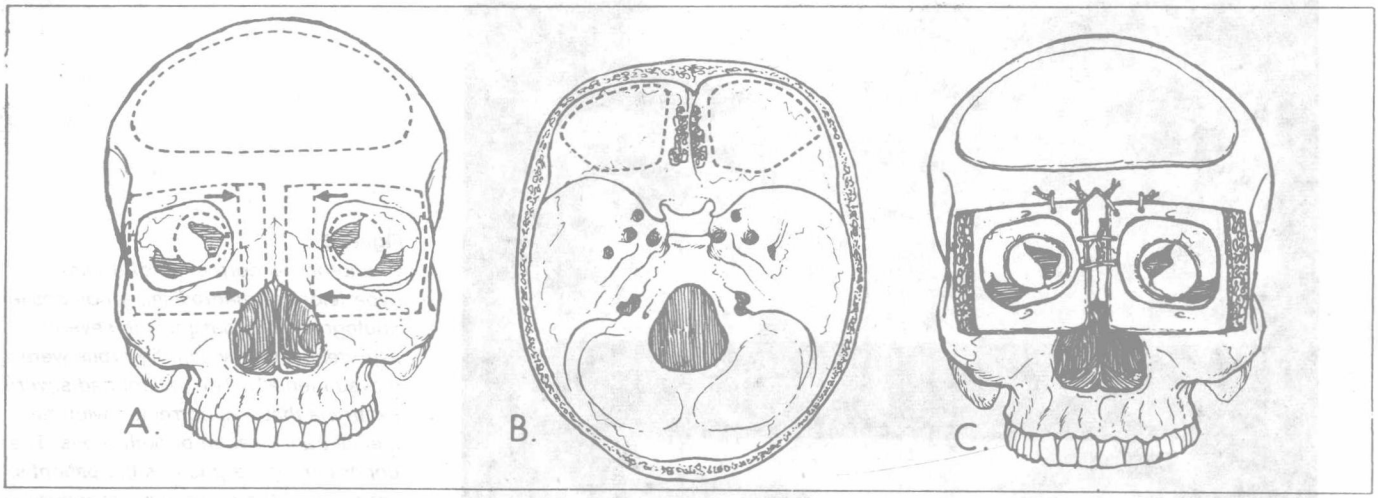

Figure 2

*A diagrammatic view of cranio-orbital correction procedure. **(A)** An outline of the external and intraorbital circumferential osteotomies. Note the two paramedian segments to be removed. **(B)** The intracranial corresponding osteotomies. **(C)** With the orbits rotated medially, a gap is created laterally in which a large piece of bone graft (usually the iliac bone) is used. The bone graft is used as a "friction lock" to lock the osteotomized segments in place. The bone between the forehead and osteotomized segments is the frontal bar, which is used as a guide to position the osteotomized orbits into their appropriate place, based on the preoperative plan. (Courtesy of Dr. M. Habal.)*

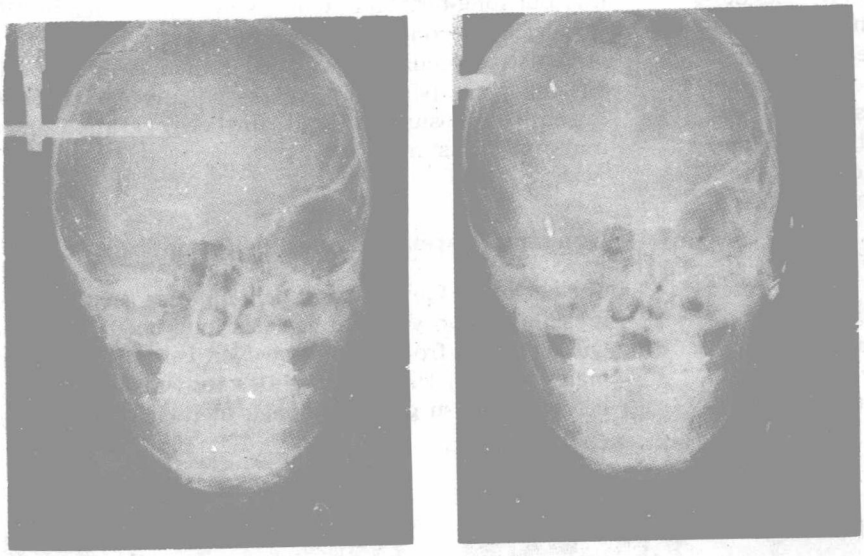

Figure 3
(A) Preoperative cephalogram. The interorbital distance was 42 mm in this patient (same as Figs. 1 and 2). The small black "dots" represent the site of measurements, which is usually between the two dacryons. (B) Postoperative cephalogram. Note the site of the osteotomies and the intensive interosseous wiring that is used to stabilize all osteotomized segments in place. (Courtesy of Dr. M. Habal.)

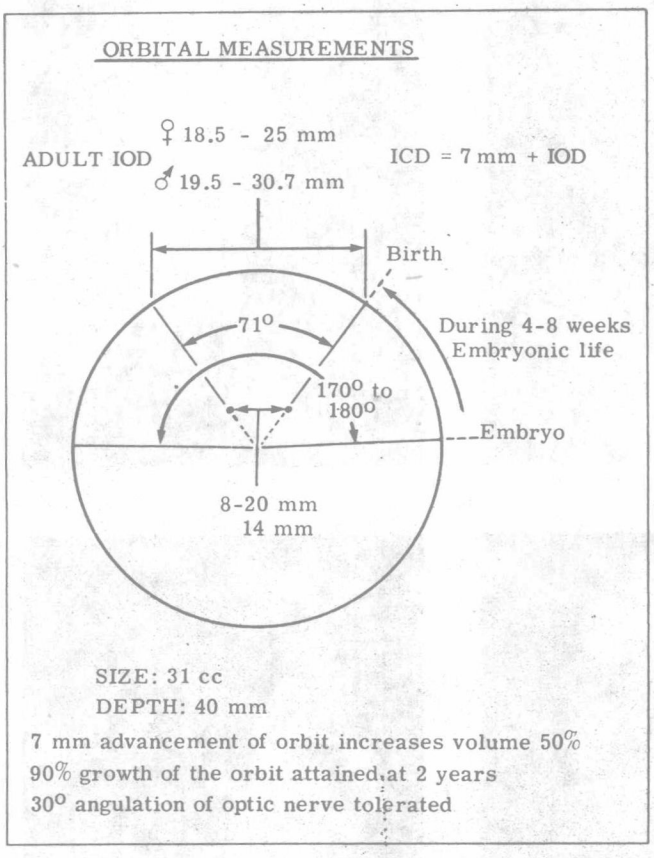

Figure 4
A diagrammatic scene of the rotation of the orbits during embryonic life. The operative procedure used reintroduced a similar rotation with the fixed center that represents the optic foramina. (Courtesy of Dr. M. Habal.)

speech patterns as a consequence of palatal defects outweighs the risk of midface deformities, and that definitive palatal closure should be accomplished by the time speech-pattern formation is approaching (6). Whether performed early or late, the more conservative von Langenbeck palatoplasty has gained additional support as being accompanied by the lowest morbidity and minimal facial growth deformity with a reasonable rate of velopharyngeal competence (6a,6b).

The traditional approach of staged repair of lip, palate, and nasal deformity is being challenged by the respected group of Ortiz-Monasterio in Mexico City, where a large series of patients have undergone early simultaneous repair of lip, palate, and nose, the latter by means of an external approach and incision. Early results are promising, but long-term follow-up is not yet available. With respect to secondary palatal surgery, when postoperative fistula occurs, use of a palatal vinyl appliance during the early postoperative period appears to be followed by closure without further operation in the majority of instances (6c).

Congenital Arteriovenous Malformations

The occasional problematic hemangioma that fails to regress after two years of age has long been recognized. Quite distinct from these, however, is the arteriovenous malformation, which sometimes represents a threat to life and is a surgical challenge of the greatest magni-

Figure 5
Frontal (A) and profile (B) views of patient with a massive hemangioma of tongue, lips, and oral cavity, with compromise of her airway.

Figure 6
Postoperative views (A and B) after incomplete resection utilizing the technique of excision and oversewing of wound edges.

tude. Arterial and venous ligation alone is known to be futile. Embolization of muscle (7), or Gelfoam bits, adhesives (8) or small spheres, as practiced by the surgeon or arteriographer, is being used increasingly and with better success. Although eradication may not be achieved, a dramatic decrease in vascularity may make surgery much less formidable. This procedure may also be used before operation on other vascular tumors, such as juvenile angiofibroma (8a). Such procedures are not without hazard, however, and a misdirected embolic fragment can cause cerebrovascular complications.

If there has been any significant change in the treatment of this entity, it is the increasing frequency with which a frontal surgical attack has been made with the objective of total ablation of the process. Even with massive growths in the head and neck region, surprisingly good results have been achieved (9). In some instances, limited resections have been appropriate and helpful where excision and oversewing of the transected margins have been possible (Figs. 5 and 6). Recently, operation on very large vascular formation has been carried out under cardiopulmonary bypass using hypotension and hypothermia (9a,9b).

The longstanding challenge of portwine stain is being met with increasingly encouraging results with use of the argon laser for treatment. Both Apfelberg and colleagues (9c) and Ohmori (9d) have reported large series with good but not uniform improvement. The response is said to vary according to histologic classification — constricted, intermediate, or dilated — the last being the most responsive.

HEMIFACIAL ATROPHY

Classically, hemifacial atrophy affects the skin, subcutaneous tissue, and muscle, with occasional involvement of the bones and cartilage in cases in which onset of the disease occurs prior to full development of these structures. Traditionally, a number of approaches have been used in the correction of this disorder, also known as Romberg's disease.

Previous attempts at corrections have included utilization of dermal and dermal-fat grafts, implantation of alloplastic materials, and subcutaneous implantation of de-epithelialized deltopectoral or other flaps. These methods have yielded good to indifferent results. Some of the best results, however, appear to have been achieved by injection of medical-grade silicone, in small amounts and on several occasions, over a prolonged period of time (see Figs. 7 and 8, courtesy of Dr. Ralph Blocksma). In the hands of approved investigators, this has resulted in some superior improvements (10), and it may well be one of the few good indications for the use of injectable silicone. With the present controversy over long-term complications with silicone, however, medical-grade silicone is not available for clinical use and may not be for some time. Another approach to this problem has been the use of the omentum as a revascularized free flap anastomosed to neck vessels and transplanted under facial skin.

Figure 7
Preoperative views (A, B, C) of patient with severe hemifacial atrophy. (Courtesy of Dr. Ralph Blocksma, Grand Rapids, Michigan.)