

PRESERVATION OF SOFT TISSUES IN NASAL SURGERY

Roland M. Loring, M.D. Chicago, Illinois *

This presentation of a small part of the problems of nasal surgery is actually a large subject and keeps growing in importance and significance, as does every phase of nasal surgery, with increasing experience. I have the conviction that many points of interest should be stressed and elaborated upon. The soft tissues with which we are concerned are the skin, the subcutaneous tissues, the periosteum over the external nasal pyramid, the organ of expression which is the subcutaneous layer of striated muscle and fibrous tissues, fascial "envelopes" of cartilages, muscosae, submucosal structures and the perichondrium and periosteum of the septum.

Preoperative evaluation should include notation of skin disorders of the patient such as acne, lupus, rosacea, allergies, scars, adhesions, contractions, hypertrophy, atrophy, ecchymoses, swellings and so forth. Preoperative preparations such as cutting the vibrissae, washing and disinfecting of the skin of the nose and face and vestibules, sterile draping, and maintaining strict sterile precautions as well as sound general surgical principles are of paramount necessity in the avoidance of soft tissue damage.

The preservation of soft tissue begins with properly placed and well executed incisions which should avoid the cutting or injuring of blood vessels, nerves, and connective tissue fibers which can possibly be spared. Many soft tissues can be spread gently with dull pointed scissors and the columns of fascia containing larger blood vessels and nerves gently pushed aside. One should cut, if he must, neither too close to periosteum or to the surface skin; but this, however, is sometimes desirable; e.g., in rhinophyma. The incisions should be minimal in number and size as both skin and mucosa can be stretched temporarily to a larger dimension. "Ringing" of the os internum with large incisions must be avoided.

The hemitransfixion incision should extend neither too anteriorly nor too posteriorly as entrance to the submucosal spaces and to the base of the nose can be attained by stretching, thus preserving the mucosa and skin. Especially is the preservation of the integrity of the floor of the vestibule important. By properly placing the hemitransfixion an eighth of an inch behind the caudal end of the septum while the columella and the membranous septum are being pulled forward, the latter is completely preserved. In the event of a short

* From the Departments of Otorhinolaryngology, Chicago Medical School and Illinois Masonic Hospital, Chicago.
Presented at the International College of Surgeons Annual Meeting, New York City, September 10, 1962.

contracted scarred membranous septum, extensive freeing of both mucosae and the judicious employment of split-skin grafts may help to restore this structure and its free functioning.

All transfixions should be conservative, either small or medium in size, and practically never complete. The new protected Bard Parker = 15 designed by Cottle has been found very efficient for this purpose. The pre-spine fascia and contiguous fascias can be displaced downward and forward with dull instruments and rarely need be torn or cut.

Vestibular osteotomy incisions should be small and begin at the level of the floor of the aperture just lateral to the lateral border of the pyriform aperture and continued upwards for about five millimeters. A small incision in the periosteum allows its elevation which should be limited to the region of the naso-optic groove or just above as may be indicated for the osteotomy to be done. Avoidance of injury to the endosteum must be meticulously practiced by having the tip of the saw always upon bone while only the rim of the aperture is cut through with the heel of the saw. Completion of the osteotomy is accomplished with chisels and osteotomes and directional fractures.

The length of an intercartilaginous incision is determined by the extent of the lobular cartilages ¹; the location of the incision by the characteristics of the cul-de-sac. Injury to the upper lateral and septal cartilages can be prevented by remembering that the incisions consist of small cuts done in three planes. A gentle to-and-fro sawing or oscillating movement produces not only a well placed incision, but also enhances the healing of the wounds.

Alar incisions are done in the alar-labial groove and may be combined with interstitial thinning incisions. They heal well and with rarely any noteworthy complication. Their use obviates the need for a buccal approach to lateral osteotomies and assists in the narrowing and shortening of the nose when these are parts of the operation objectives. In addition they permit shortening and clocking of the alae. By using the long arm "U" variation, narrowing can be increased without sacrifice of vestibular skin. Both of these methods of incising the alae permit the best use of base sutures which aid in narrowing the base of the nose as well as the nose itself, and assist in the rotation of the columella and tip and the repositioning of the displaced pre-spine fascia. All injuries to the mucosa are harmful. These include manipulation with instruments and pressures from packing and pushing. If an incision must be made in a mucosa, it should be planned in an anterior-posterior direction rather than superior-inferior. Lacerations and perforations should be repaired and if necessary covered by skin grafts. Separation of any mucosa from bone or cartilage, especially from the upper lateral cartilage, should be kept at a minimum.

Preservation of the mucosal reflections under the entire dorsum is of extreme importance and is accomplished in many ways. Intraseptal medial osteotomies preserve the reflection of the mucosa under the nasal bones and also under the upper lateral cartilages. Medial osteotomies started anterior to the nasal bones can also preserve the mucosal attachments beneath. A proximal osteotomy preserves the bone-cartilage union. By using the right hemitransfixion for septum surgery ², the left mucosal flap is maintained in intact continuity with the membranous septum and columella. A properly placed right

hemitransfixion combined with a limited intercartilaginous incision (right) preserves a "tongue of uncut tissue" between the two which can hold up the right septum mucosa flap. When these precautions have been planned and observed, an intact cylinder of mucosa persists in each nasal chamber and a well placed internal dressing or packing can be used as a supporting mold about which the pieces of bone and cartilage of the external pyramid may be draped, shaped and held in place until the healing processes adequately take over. The canopy of muscle and connective tissues over the upper lateral cartilages as well as the lining mucosa can be successfully separated from the cartilage itself if the latter alone requires surgical correction.

The preservation of the mucoperichondrium of the septal cartilage is of the greatest importance. Too often the mucosal elevation appears correct but the innermost layer of tissue may still remain attached to the cartilage. We have color photographs that illustrate the two possibilities. Scraping the cartilage with a sharp stiff knife assures the complete detaching of the whole perichondrium.

More could be said on the subjects of lobular incisions, medial and lateral osteotomies, V-Y incisions, lengthening of membranous septum, retracted columella, and other procedures all designed to avoid soft tissue injuries.

Replacement and repair of connective tissue over the dorsum of the nose must be given thorough and careful attention as well as irregularities and deformities of the dorsum surface. Implant materials of all types and varieties have been used for many years for these two purposes and include autogenous and preserved bone and cartilage. At the present time we are using processed bovine cancellous bone prepared by the Squibb Institute for Medical Research. Seventy patients in whom this bone was used are the basis for a report recently presented at the American Rhinologic Society meeting. We believe that processed cancellous bone engenders the formation of new fibrous tissue as well as it enhances the healing of injured connective tissues and yet with almost no possibility of antigenic reaction. Many major and minor deformities of the dorsum have been corrected successfully and the procedure, therefore, represents a great advance in the handling of otherwise difficult challenging situations.

Postoperative tissue reactions and swellings proceed through various stages and these must be evaluated for proper care of the patient. They are:

1. Edema with ion migration.
2. Protein transudation.
3. Mucinous substance exudation.
4. Cellular infiltration especially by white blood cells of all kinds.
5. Hemorrhage with pressure and necrosis of tissue.
6. Elaboration of fibroblasts, mast cells, and collagen leading eventually to scar tissue formation.
7. Allergic and infectious inflammatory responses.

The consequences of these tissue changes can be noted externally as:

1. Hypertrophies.
2. Atrophies.
3. Minor and major deformities of varying degrees.
4. Significant functional changes.

The postoperative care of the patient should include an effort to cope with these complications. Adequate treatment includes proper use and timely removal of suture materials, the preserving of the lining and cover over implanted materials, gentle contact dressings of the nose internally and externally, delicate handling of surrounding tissues, and frequent observation and changing of all dressings. Healing continues for a long time and judicious use of tape to prevent ecchymosis and swelling, as well as medications such as premarin, enzymes, ascorbic acid, steroids, and heparin will all enhance the rate of recuperation of the soft tissues and their further preservation.

Disturbances of the functions of the nose are most difficult to estimate, but must surely be in proportion to the injuries and the persistence of distress of the soft tissues. Most insidious sequelae occur months and years after nose operations and their causal relationships may be obscured by the elapsed time, but there is no gainsaying the logic and the inevitability of the conclusion that preserving the soft tissues of all parts of the nose will ensure the preservation of all of their functions that can possibly be saved.

25 East Washington Street

REFERENCES

- ¹ Cottle, M. H.: The Structure and Function of the Nasal Vestibule, Arch. Otolaryngol. 62: 173-181, 1955.
- ² Cottle, M. H., Loring, R. M., Fischer, G. G., and Gaynon, I. E.: The "Maxilla-Pre-maxilla" Approach to Extensive Nasal Septum Surgery, Arch. Otolaryngol. 68: 301-313, 1958.