

EXPERIENCES IN THE USE OF GENERAL ANESTHESIA FOR CORRECTIVE RHINOPLASTY

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GENERAL anesthesia for corrective rhinoplasty is commonly employed in England (1). Matthews (2) stated that general anesthesia is required in rhinoplasty. In the United States, however, local anesthesia is customarily used. Safian (3) said, "General anesthesia should be absolutely interdicted in the performance of intranasal plastic operations. It adds an unnecessary risk and is a great annoyance to the surgeon; the operative field is kept aseptic with difficulty; and finally, the flow of blood into the pharynx adds to the danger of aspiration pneumonia or lung abscess." One of us (J. A. T.) assisted Safian in the preparation of his book in which this statement appears. Padgett and Stephenson (4) stated, "Generally one should not attempt corrective rhinoplastic operations under a general anesthesia, and the risk is less for the patient as the flow of blood into the pharynx is avoided." Seltzer (5) said, ". . . concerning the general question of the best method of anesthesia, the writer's own experience has shown infiltration anesthesia to be the method of choice. General anesthesia is cumbersome and makes operation more difficult. If for any special reason a general anesthetic should be found necessary, ether by intratracheal inhalation is the method preferred. Safian emphasized that the local method should be used without exception. On the other hand, though he recognized the greater advantages of local anesthesia, Joseph considered general anesthesia sometimes necessary, especially, in those children who cannot be treated satisfactorily otherwise." Kazanjian and Converse (6) stated, "Local anesthesia is preferable for simple corrective nasal surgery." Barsky (7) stated, "Local anesthesia is the method of choice, since it is easier for the patient and at the same time enables him to cooperate with the surgeon, thus facilitating the operation." Erich (8), however, said "At the Mayo Clinic for most rhinoplasties we have found it convenient to use general anesthesia for which pentothal sodium and curare are employed as the anesthetic agents and oxygen is administered through an intratracheal tube emerging from the mouth. For hemostasis, however, I employ 0.5 per

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cent solution of procaine hydrochloride with epinephrine (one drop to the dram) which is infiltrated subcutaneously along the side of the nose, and in the nostrils and columella. Packs of 10 per cent cocaine with epinephrine applied within the anterior part of the nasal chambers are of inestimable value in controlling hemorrhage."

One of us (J. A. T.), in the past fifteen years, has performed over 2000 corrective rhinoplasties under local anesthesia. Our experience with the use of general anesthesia is limited to one year, the number of cases (72) being statistically far less significant. On this basis, we are not attempting to evaluate the relative safety of general anesthesia versus local anesthesia in corrective rhinoplasty. The answer to this question, the crux of this subject, is not and probably will not be easily ascertained. In the first place, the relative safety of general anesthesia versus local anesthesia in selected patients who are in excellent condition for other types of surgical procedures is not established. A number of anesthesiologists, independently polled, stated that a well-controlled general anesthesia in a patient who is a good surgical risk carries no more significant hazard than local anesthesia. This philosophy, while not specifically stated in the literature, would seem to obtain in England where the anesthesiologists are very competent. A controlled general anesthesia in corrective rhinoplasty is subject to some difficulty. In the section on the technic of administration of the anesthetic agent, we present these difficulties and their solution.

Our experiences with general anesthesia for corrective rhinoplasty may be considered from three points of view; first, the point of view of the patient; second, that of the plastic surgeon and third, that of the anesthesiologist.

GENERAL ANESTHESIA FOR RHINOPLASTY FROM THE PATIENT'S VIEWPOINT

The most significant finding in this study was noted in the attitude of the patient. In an attempt to evaluate the patient's reaction to general anesthesia, we tried to find the answer to the following question, "How much discomfort did you experience under local anesthesia?" Thus we should discover what percentage of patients suffers very little discomfort, what percentage suffers more and lastly, how many encountered an experience which they found almost intolerable. One hundred patients chosen at random who had been operated on under local anesthesia before December 1949 were asked what their choice of anesthesia would be if they were to undergo the operation for the first time. Finally this question was asked of new patients, "Which anesthesia, local or general, would you prefer?" The findings will be given as objectively as possible.

Discomfort under Local Anesthesia

(1) *Anxiety*.—Most patients are anxious before operation. The basis for the anxiety is complex, being compounded of fear of the opera-

tion and worry about the outcome. Since this operation is almost purely elective, these patients are usually very cooperative. Preoperative medication, such as nembital, 3 grains two hours before operation, with morphine sulfate, $\frac{1}{2}$ grain, and atropine sulfate, $\frac{1}{150}$ grain one hour before operation, prepares the average patient adequately and permits him to tolerate the operation. In the average case, the fear of the operation is dispelled by the first needle prick. Just as soon as the patient discovers that he can tolerate the operation, he relaxes and often states that the operation is not as bad as he had expected. In others, however, the anxiety persists throughout the operation. In such instances the operation is notably difficult for all concerned.

(2) *Pain.*—Assuming that the reaction to procaine is normal (our anesthesia of choice for corrective rhinoplasty), the patient's pain sensibility should be blocked by the anesthetic agent. Pressure sensibility, however, is frequently not affected. The patient is aware of touch and of the pulling, rasping and bone fracturing incident to the operation. Most patients tolerate the pulling of the nasal tip, the sawing, and the nasal bone fracturing without undue discomfort; in others, these maneuvers are almost intolerable. Additional local anesthetic agent may be administered without effect. The obliteration of pain sensibility is evidenced by the lack of pain when the incision is made. Nevertheless, such patients will complain of pain on manipulation of the nose and in sawing of the bones, even though the nasal mucous membranes have been well cocaineized.

(3) *Nausea.*—Many patients who do not complain of pain or pressure discomfort complain of nausea induced by the necessity of swallowing the blood that runs down the throat during the operation. It has been our practice to tell patients that there is no blood running down the throat, the fluid being the procaine we have injected. This little game sometimes allays some of the discomfort. Excessive intranasal administration of cocaine will, by anesthetizing the pharynx, make the swallowing of blood more difficult and hence more uncomfortable. Usually, the patient's discomfort can be minimized by distracting him. A calm, pleasant attitude on the part of the surgeon and everyone in the operating room helps a great deal. A lively conversation on some subject other than the operation will often distract the patient.

(4) *Psychic Disorders.*—Hysterical reactions in greater or lesser degree are found in the patients who later regard the operation with abhorrence. In a few instances amnesia, disorientation, and excitement were encountered. Whether these reactions resulted from procaine or cocaine sensitivity, hyperreactivity, or preoperative administration of scopolamine or barbiturate was not established. In each instance the operation was quickly terminated and the effects wore off completely. The use of intravenous barbiturates was not considered in these patients because of the fear of aspiration of blood.

In view of this array of possible discomfort in the course of corrective rhinoplasty, it would seem as though no patient would recommend the operation or admit that he would go through it again if need be. This is not the case, however.

One hundred patients satisfied with the aesthetic and functional result were chosen at random. Fifty per cent stated that they did not mind the operation at all; they were glad they had had the operation performed, and if they were to go through the operation for the first time, they would choose local anesthesia. Twenty-five per cent of the 100 found the operation uncomfortable but stated that they would choose local anesthesia again in preference to general anesthesia. This preference was probably based upon their knowledge of what the local anesthesia was like, general anesthesia being an unknown quantity.

The final 25 per cent found the operation under local anesthesia a disagreeable experience. Five admitted that the operation was an "awful experience" although they were satisfied with the result. Most of this group stated that they would certainly have preferred general anesthesia had they been offered the choice.

New patients, however, when offered the choice of operation presented a significant finding. When told about the percentage experience of the patients who had undergone local anesthesia, 75 per cent chose general anesthesia. The remaining 25 per cent either did not think they would mind the operation under local anesthesia, were afraid of general anesthesia or did not wish to incur the extra expense of general anesthesia. This preference for general anesthesia by the majority of new patients is continuing in our experience. McIndoe (9) stated that the average Englishman would not want local anesthesia. Whether this would be true in the United States would depend upon the availability of the choice of anesthesia, and the accumulated experience.

GENERAL ANESTHESIA FOR RHINOPLASTY FROM THE VIEWPOINT OF THE PLASTIC SURGEON

It has not been possible, in our fifteen years' experience, to evaluate in advance, with any accuracy, the patient's reaction to the operation under local anesthesia.

General anesthesia offers relief from the necessity of allaying the anxiety and other complaints of the patient and is a real advantage to the surgeon. Completing an operation under local anesthesia on a somewhat hysterical patient is a harrowing experience both for the patient and the surgeon.

There are two main disadvantages, however, to working under general anesthesia. First, the draping of the oral endotracheal tube out of the operation limits the view of the face so that evaluation of the result at the operating table is not as easy as under local anesthesia.

A clearer view of the desired result must be born in mind. We have not, however, found this problem overly bothersome.

The second disadvantage is the increased bleeding encountered in corrective rhinoplasties performed under general anesthesia. Whereas with local anesthesia, the operative field is usually quite dry, under general anesthesia the field may be very wet and the operation must sometimes be performed more blindly than desirable.

For our operations we have routinely used 1 per cent procaine with 10 drops of epinephrine to the ounce. In addition, we routinely cocaineize the nasal mucous membranes even though a combined rhinoplasty and submucous resection is not contemplated. When general anesthesia is employed we infiltrate the nose with saline solution or procaine with epinephrine added in the same fashion as when local anesthesia is used. The inside of the nose is also cocaineized. In spite of this administration we have encountered increased bleeding in approximately 50 per cent of the cases.

Our usual operative time for complete rhinoplasty with submucous resection, when indicated, is about one and one-half hours. In this space of time there have been some instances of loss of over 300 cc. of blood. Whether general anesthesia is desirable when the operation is expected to take longer than two hours is open to question. Certainly, if the patient's attitude is ignored, the technical performance of the operation under local anesthesia is facilitated.

For teaching purposes, general anesthesia would seem to offer an ideal medium. The only drawback is the increased bleeding. Until further advances provide a means of obtaining a comparably dry field, we recommend that the beginner in rhinoplasty develop his technic under local anesthesia. When he becomes sufficiently adept to perform the procedure almost by the sense of touch, he may assay general anesthesia, and obtain a satisfactory result even in the presence of considerable bleeding.

GENERAL ANESTHESIA FOR RHINOPLASTY FROM THE VIEWPOINT OF THE ANESTHESIOLOGIST

As mentioned previously, most American authors mention that local anesthesia is the method of choice. Possibly this attitude has been handed down from textbook to textbook and adopted generally without being adequately questioned and considered in the light of the procedure as a whole. For the past year we have worked out a procedure for general anesthesia, to be described, with which we have been pleased, the patients grateful and the results satisfactory. In discussing the problems of general anesthesia for corrective rhinoplasty two categories should be considered: general problems concerning plastic surgery and those problems peculiar to operations on the nose and mouth.

Factors important in plastic surgery in general:

- (a) Bleeding should be minimized and completely controlled. This is particularly important when dealing with skin flaps, pedicles or grafts. In corrective rhinoplasty, however, the importance of this lies primarily in the fact that the increased bleeding with general anesthesia makes for greater inconvenience to the surgeon during the procedure.
- (b) Hypoxia and carbon dioxide excess must be avoided in the administration of any anesthetic agent, but deserves emphasis here because of the increased oozing either condition produces. These can be avoided only by maintaining an adequate airway together with adequate respiratory exchange.
- (c) Recovery should be fairly rapid with the early return of reflexes.
- (d) Recovery should be smooth, quiet and without excitement and delirium.
- (e) Relaxation is not a consideration here, so the depth of anesthesia need be only that required to allow the patient to tolerate the endotracheal airway. "Bucking" on the endotracheal airway should be avoided since the straining and concomitant increased venous pressure will increase oozing.
- (f) The surgeon must be allowed time after the operation to place the dressing carefully with the patient still lightly anesthetized.
- (g) Carbon dioxide absorption, closed technic must be used. The absorber must be working efficiently and the closed technic allows for more adequate control of ventilation.
- (h) The Meticulous attention to detail is the most important factor.

Factors for consideration in corrective rhinoplasty :

- (a) The anesthesia apparatus must be kept out of the surgeon's field.
- (b) Epinephrine is almost routinely used by the surgeon and legitimately so.
- (c) In rhinoplasty the oral route for tracheal intubation must be used.
- (d) The patient's head is frequently moved during the procedure.
- (e) An endotracheal tube with a well-functioning inflatable cuff is necessary, not only to maintain a closed system, but because of the flow of blood into the pharynx.
- (f) Kinking of the endotracheal airway is an ever-present danger and will occur very frequently if a soft rubber tube is employed. Because of the position of the head and the weight of the connectors and tubing together with the weight of the drapes, a semirigid tube which will not kink is a necessity.
- (g) Because the anesthetist is removed from the region of the head, he needs more than ever to be vigilant.
- (h) The eyes of the patient frequently tend to open and therefore

provision should be made to protect them from trauma and blood.

- (i) The anesthetist must ascertain beforehand precisely where the surgeon and his assistants will stand; where the suction machine, instrument table and floor lamp will be situated in order to fit himself and anesthesia machine into a harmonious arrangement.

Considering the problem as a whole and taking into account our experiences and the factors mentioned above, it is our opinion that a satisfactory method of general anesthesia for corrective rhinoplasty is as follows.

After customary preoperative study, premedication, which is not routine, is administered hypodermically approximately one hour before induction of anesthesia. Inasmuch as the patients are excellent operative risks in the younger age groups, the premedicants are usually Morphine sulfate, $\frac{1}{2}$ grain, and atropine sulfate, $\frac{1}{150}$ grain. In the operating room, induction is accomplished with 0.5 per cent pentothal intravenous drip which provides a smooth, pleasant and fairly rapid induction. When the desired depth of anesthesia is approached, which usually requires between 50 and 100 cc. of the solution, syncurine, 3 cc., is given intravenously through the tubing of the veno-tube delivering the pentothal. Approximately two minutes later, after a brief period of oxygen inhalation, and preceded by spraying the vocal cords with a 2 per cent solution of pontocaine, orotracheal intubation, using an anode tube bearing an inflatable cuff, is accomplished under direct vision. The anode tube is the most desirable because of the danger of kinking with other tubes as already mentioned. We prefer the closed circle absorption technic to the to-and-fro technic. The circle type allows for a minimum of equipment in the operative field and the machine and rebreathing bag are away from the field and near the anesthesiologist.

After intubation, the tube is fixed with adhesive tape to that side of the face and chin which will be farthest removed from the nose so that there will be no distortion of the patient's features. It is connected to the circle conduits and the cuff inflated to the point where gentle pressure on the bag fails to produce leakage around the tube. Oxygen at a flow of approximately 300 cc. per minute is delivered from the machine.

Boric acid ointment, 5 per cent (ophthalmic), is inserted in the patient's eyes to protect them and serve as an adhesive in maintaining the lids closed. A few pieces of gauze tied together are loosely placed in the pharynx and serve to absorb blood which must necessarily flow down from the nasopharynx. Frequently it is desirable to introduce ether into the system while stopping the pentothal in those cases in which large doses of pentothal are required to maintain the proper depth of anesthesia (to avoid "bucking"). Otherwise continuous

slow drip of pentothal is the primary anesthetic agent. In such instances a change is made to ether which allows for a smoother course during, and a more rapid emergence from anesthesia.

At the conclusion of the operation, after the dressing is applied, the gauze packing is removed from the pharynx and thorough suctioning through a urethral catheter (number 18 French) is done. When the pharynx has been suctioned, a smaller catheter (number 12 French) is passed into the endotracheal tube for tracheal toilet. After deflating the cuff the endotracheal tube together with the suction catheter within it is withdrawn. Following this the pharynx is again suctioned with the wide bore catheter. The patient at this point reacts sufficiently to refuse an oropharyngeal airway, and frequently is awake enough to open the eyes or move slightly.

There has been no morbidity and the patients are up and about the evening of the day of operation. Post-operative nausea and vomiting have been absent and the patients universally agree that the experience was surprisingly free from discomfort and displeasure.

SUMMARY

General anesthesia for corrective rhinoplasty is commonly employed in England, but in the United States it is employed in only a few clinics. According to the American literature local anesthesia is the method of choice.

Our experiences with general anesthesia in the past year are presented, with special note as to the reaction of the patient when given a choice of anesthesia. Twenty-five per cent of patients preferred local anesthesia. Seventy-five per cent of *new patients* preferred to have general anesthesia.

Because bleeding is increased during general anesthesia, the operative technic is more difficult.

In our series of 72 cases the morbidity, both in percentage and degree, was no higher than in those cases in which operation was performed using local anesthesia.

The pertinent factors to be considered in the administration of general anesthesia for corrective rhinoplasty have been discussed.

The importance of the anode endotracheal tube and the closed circle absorption technic are emphasized.

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