

## EXPERIENCES WITH NASAL INJURIES

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It has been my good fortune to have been associated with Dr. Maurice Cottle for eighteen years in the teaching of Rhinology, and during that time I have had the opportunity to see and care for a good many nasal injuries. Dr. Cottle has stated that injury to the nose is the most frequent injury of man. Since a good part of the rhinologist's time is spent in handling nasal injuries I thought it would be interesting to review all cases of fracture of the nasal bones or nasal septum seen in 1967. I was interested in the causes of the fractures, the treatments given, and the short term results. The final result of the injury is often not apparent for several years.

All of the cases were seen as hospital in-patients or out-patients. The time which elapsed between injury and surgery was a few hours to as long as three weeks. Even after this length of time the parts could be manipulated.

Causes	No. of cases
1. Automobile accidents . . . . .	45
2. Falls . . . . .	21
3. Fights . . . . .	16
4. Baseball injuries . . . . .	14
5. Assailed . . . . .	9
6. Basketball . . . . .	7
7. Hit by objects . . . . .	7
8. Football . . . . .	6
9. Hit by baby's head . . . . .	2
10. Birth injuries in babies . . . . .	2
11. Train accidents . . . . .	2
12. Bumped into door . . . . .	1
Total . . . . .	132

Many of the automobile accidents had associated injuries and two or three were unconscious for several days. The falls were caused by such varying things as bicycles, tumbling, fainting, slipping in the bathtub and slipping on the ice. Baseball injuries accounted for rather severe fractures. The popularity of Little League baseball has produced a good many small boys with severely injured noses. Objects such as as crowbars, horseshoes, surf board, water skis, automobile tire explosion, and rocks, accounted for several serious injuries involving lacerations. Those who were assailed had nasal injuries often associated with facial fractures.

It was interesting to note that only one person stated that she broke her nose

by running into a door. On one day I reduced the fractures on two boys who had broken each other's nose in a fight.

An unusual cause of a nasal fracture is the baby's head. The baby's head, when suddenly thrown backward against the parent's nose, can become a severe, crushing instrument.

Out of 132 cases, 21 cases had other severe injuries. Ten cases had fractures of the maxilla or zygomatic arch; two cases had fractures of the frontal sinuses; five cases required extensive repair of facial lacerations; three cases had severe head injuries and were unconscious for several days, one of these required a tracheotomy.

## **Anesthesia**

General intratracheal anesthesia was given to children, unstable adults, and to those cases who had other facial injuries such as a fractured maxilla. In the cases where a closed reduction was done the nose was infiltrated with 5cc of a solution of hyaluronidase, 150 units in 30cc of saline. If a septal operation was done under general anesthesia the areas of incision were infiltrated with xylocaine 1% with epinephrine 1 : 100,000. The nose was also packed with 1/2" gauze moistened with 1/4" neosynephrine for shrinkage of the mucous membranes.

The use of local anesthesia was different in closed reductions than in those cases where a septal or pyramid operation was done. In closed reductions, topical anesthesia was applied by cocaine flakes on epinephrine-moistened applicators. The pyramid was injected through the cul-de-sac with 5 to 10cc of xylocaine 1% solution which contained hyaluronidase. No epinephrine was used in the solution to be injected since no incision was to be made. The more extensive cases were anesthetized with cocaine and epinephrine topically and xylocaine 1% with epinephrine 1 : 100,000 and hyaluronidase added to the solution, 150 units to 30cc.

The final diagnosis of the fracture could not be made until after the injection of the hyaluronidase solution. After gentle pressure it was apparent exactly what portion of the bones had been fractured, and after shrinkage of the nose with either neosynephrine or cocaine and epinephrine, the final diagnosis of the septal pathology could be made.

## **Care**

Debridement and meticulous repair of the wounds was done in all cases involving-lacerations of the nose or face. The most difficult and time-consuming procedure was to remove paint or grease from a wound. Frequently the paint from a steering wheel penetrated the wound and was actually driven into the nasal bones. All little pieces of paint have to be scraped or curetted from the bone before any other surgery on the septum or pyramid could be completed. There were 45 cases who required a septal operation; of these, 15 cases had lateral osteotomies. Open reductions were done in 14 cases which consisted of doing intercartilaginous incisions and manipulating the nasal bones, or working directly on the bones through a severe laceration, or draining a hematoma of the upper lateral cartilage. The remaining 73 cases had closed reductions.

## Closed reductions

In doing closed reductions a Boies elevator or McKenty elevator was used to manipulate the bones. Often it was necessary to disimpact the nasal bone-maxilla complex, out-fracture, and then mold into position. It was found to be helpful to mold the nose over a heavy Killian speculum using the screw to hold the blades apart and thus not injure the septum.

Frequently the bone was in-fractured from the injury, thus bringing the upper lateral cartilage close to the septum. If this is allowed to heal there will be formed an obstruction in the valve area and the patient will, from then on, have breathing difficulty on that side.

When the nose is in good alignment it is packed with 1/2" gauze soaked in cod liver oil. A tape dressing and stent mold are applied. The dressing is usually left on two to five days, depending on the case. It is changed and reapplied in the office.

## Septal surgery

All surgical explorations of the septum were done using the surgical techniques that were developed and taught by Dr. Maurice Cottle. The premaxillary approach was used in most cases. It was interesting to note that in the majority of cases the septal pathology consisted of a fracture-dislocation of the inferior border of the septal cartilage to the side of the premaxilla. There was frequently hematoma present in this particular area and this was often organized and tenacious. Injuries from below often produced fractures of the maxillary spine, premaxilla, and even the vomer. Posterior fractures of the septum due to a crushing blow only on the nasal bones consisted of fractures of the perpendicular plate of the ethmoid and of the vomer, and these would often cause a marked obstruction by contact with the turbinates.

The nasal bones were elevated by manipulation with a blunt elevator through the septal space. If this did not produce the proper result lateral osteotomies were done. Lateral osteotomies were done in 13 cases. This procedure helped greatly in mobilizing the pyramid and in equalizing the lateral walls. In some cases where only a small portion of the nasal process of the maxilla remained intact, a single lateral osteotomy was done in order to mobilize the entire nose.

The repair of the septum after surgery has been found to be most important. As usual, an internal dressing is inserted of 1/2" cod liver oil gauze. Any bone that has been removed is replaced in the septum. All lacerations of the septum are closed using chromic 4—0 suture on a sabrelot needle, and this is best effected by using the Cottle septal perforation instruments.

There is a tendency for the caudal end of the septum to sag if an inferior strip or the premaxilla has been removed. To prevent this, a plain catgut 2—0 suture is placed through the anterior-inferior border of the septal cartilage. Then both ends of the suture are placed through one needle. The needle is then passed through the dorsum of the nose and the sutures are used to hold up the caudal end of the septal cartilage while it is being fixed into position. The incision is often closed by apposition of the two portions of the hemitransfixion or it can be closed by through-and-through septal columellar sutures. At the end of surgery the ends of the septal-dorsal suture are

taped on the nose. Base sutures and trans-septal base sutures helped in holding the nose in position.

### **Complications and results**

There were no complications in the series of cases which involved the nose. One victim of a robbery developed an acute urinary retention in the hospital and had to have a prostatectomy. I feel that I had poor results in three closed reductions out of 73 cases. These cases will probably need a rhinoplasty at some future date. Of the 43 cases who required septal surgery, two cases had poor results. In both cases they were teen-agers who tore off their dressings several times. One girl who had been in a severe automobile accident and had a severely torn and depressed fractured nose required a skin graft in order to repair a stenosis of the internal osteum of the nose. It is too early to evaluate the long-term results of a patient's injury and subsequent surgery, however, most cases seemed to get along very well and were rehabilitated in a relatively short time.

### **Medical legal aspects**

It has been increasingly evident that more and more of these cases of nasal injuries result in litigation. Whether we, as doctors, like it or not, we are often called upon to testify. A careful history and documentation of our physical examination is very important. X-rays have not been mentioned but they are important to substantiate our diagnosis at the time of trial. Pictures are most important both preoperative and post-operative. A camera with color film should always be at the hospital. Progress notes are most important and the patient should be followed for two years after the injury. In evaluating a person who has had a nasal injury, and there is a possibility of litigation, the nasal pressure test serves as a valuable method of testing the nasal function. Therefore, in any cases of severe nasal injury, and all cases where there is a possibility that a law suit may result, it is important to be prepared and keep the best records possible.

### **SUMMARY**

Causes, care, and results of 132 nasal fractures seen in 1967 have been reviewed. The type of anesthesia used and the care of nasal fracture have been emphasized. Particular emphasis has been placed on the pathology of septal fractures and repair of the septum. The advice to be prepared for subsequent medical legal involvement in nasal injuries should be heeded.

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