

NASAL OBSTRUCTION, THE PLACE OF SEPTAL REPLACEMENT OPERATION FOR ITS RELIEF, AND SOME OF THE PROBLEMS

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Introductory remarks

Nasal obstruction may result from obstruction of the nasal orifice, within the nasal passage or at the back of the nose. Obstruction at the orifice is commonly due to the effects of displacement of the septal cartilage: there may be an associated displacement of the nasal bones. Obstruction within the nasal canal may be due to deformity of the cartilagenous or bony nasal septum or to disease of the nasal mucous membrane.

Accepted views in the past

Past generations of otolaryngologists have been content to restrict their clinical observations to the interior of the nose, looking at the back of the cartilagenous septum, the bony septum and the mucous membrane covering the turbinate bones. They thereby were unable to see the front end of the septal cartilage — submucous resections were advocated and performed but in many instances the nasal obstruction continued. The rhinologist was unable to offer an explanation and the patient either sought another opinion or continued to treat himself with nose drops or sprays, but nasal obstruction persisted as would be expected.

It is instructive to enquire why the orthodox S.M.R. operation failed. The following observations are put forward to explain the persistent nasal obstruction:

1. Front end of the cartilagenous septum remains dislocated into 1 nostril so that obstruction continues on that side with drooping of the opposite side.
2. The whole (either the cartilagenous and bony) nasal bridge is deviated to 1 side causing distortion of the nostril and so the nasal airway is reduced.
3. The operation has been too radical, essential supports of the nose have been removed. There may be no support for the columella following removal of the whole septal cartilage. Breathing inwards forces the unsupported parts of the nose to be drawn inwards with consequent persistence of the nasal obstruction.
4. Even when the septum and nose look perfectly straight with a good airway through both nostrils, the patient may complain that he is aware of the septum falling to 1 side whilst patient is lying on that side in bed, with consequent nasal obstruction.

5. Access to the septum may be difficult, there may be sharp bends in the septum with the mucoperichondrium firmly adherent to the cartilage. It may be difficult to elevate the mucoperiosteum from the floor of the nose. Frequently the mucoperichondrium of the opposite side is torn and after the cartilage has been removed, a perforation of the septum may follow. Crusting develops at the margin of the perforation and obstruction follows.

However, the orthodox S.M.R. is a comparatively easy operation to perform and many otolaryngologists continue to do it.

In 1929, 40 years ago, Meitzenbaum wrote that the dislocation of the cartilagenous septum was part of a severe injury to the nasal bridge. The bony framework was fractured, depressed and distorted with dislocation of the bony and cartilagenous septum. Proper correction of the septum required reconstruction of the entire nose. The nasal bridge has been broadened and must be brought together thus raising the nasal bridge.

He also recognized the importance of examining the nasal orifice from below, to see dislocation of the cartilagenous septum from its support of the columella and soft tissues of tip.

Many otolaryngologists performed a complete removal of the septal cartilage believing that this operation would restore the nasal air passages — Unfortunately, by removing the support for the soft tissues, the nose tended to be drawn towards the upper lip. The columella became concave from below upwards, the scar tissue contracts pulling on the nasal tip from before backwards. The septum is straight but the nostril is not patent during inspiration. The drooping tip interferes with the intake of air so that the patient experiences nasal obstruction. The patient enjoys temporary relief whilst supporting the tip of his nose.

It is therefore undesirable and I hope to show, unnecessary, to remove all the support of the nasal tip and orifice.

In Liverpool we have been trying to develop a rational approach to the problems presented by patients suffering from nasal obstruction. Before telling you of our work, I wish to pay a personal tribute to Dr. Cottle who has shown us, by his writings and demonstrations, how to operate on the nasal septum through the premaxilla approach.

The rinologist is, unfortunately, working at a disadvantage. His only guide to the effectiveness of his work is his patient's opinion. Many patients do not understand the purpose of the operation. They experience a variety of nasal symptoms, nasal obstruction, nasal discharge, sneezing and post-nasal discharge. They anticipate that all of these symptoms will be relieved by their nose operation. Straightening a deformed nasal septum or reconstructing a deformed nasal skeleton will restore the nasal air passages but cannot relieve the other nasal symptoms. Many attempts have been made to measure and record the efficiency of the nasal air passages, but so far we do not possess a simple instrument for routine clinical estimation. I was very interested to learn yesterday of the simple method of measuring the efficiency of the nose and hope to introduce it into Liverpool in the near future.

In Liverpool we have learnt much about a patient's air passages by looking at the nose in relation to the patient's face:

1. The bridge may be distorted at its bony or cartilagenous segment.

2. It may be flattened on 1 side, with the opposite nasal bone pushed upwards and outwards.
(These 2 deformities are the result of a severe blow to the side of the nose).
3. There may have been a severe blow to the front of the nose, so that the bridge has become depressed with splaying of the nasal bones laterally.
4. Examination of the nose from the front may show no obvious deformity but gentle pressure on the nasal tip upwards will show that the end of the cartilagenous septum has been dislocated from above the columella into 1 nostril.

The decision on what to do for a given patient rests on these observations. In several instances the nasal septum was replaced and displaced nasal bones replaced by formal rhinoplasty operation during the same operation.

The indications for septal replacement operation

1. Dislocation of front end of cartilagenous septum from its support of columella in adult.
2. A similar deformity in a teenager. The youngest patient on whom I have performed this operation was 13 years old. I have avoided the operation in a younger child because it might be impossible to secure co-operation necessary for a smooth and successful operation using local anaesthetic. I have not attempted such an operation under a general anaesthetic, bleeding might be troublesome, increasing the technical difficulties.
A child suffering from nasal obstruction due to deflection of the front end of his septum, has usually been advised to await until he was 18 years old before an S.M.R. operation could be performed. Such an operation performed in a teenager would remove the natural supports of the nose and a deformed nose would result.
3. As part of reconstruction of the nasal skeleton during a rhinoplasty.

Anaesthetic

Pre-medication. Phenergan, pethidine and largactil.

Local anaesthetic

1. Surface application of 20% cocaine with adrenaline 1. 1.000 — using fine wire probes tipped with cotton wool.
2. Injection
 - a. Over the line of the incision on both sides of the septum.
 - b. Into the subcutaneous tissues of the membranous septum and columella.
 - c. Into the cartilagenous septum opposite to each middle turbinate bone.
 - d. Into the axilla where the upper lateral nasal cartilage is joined to the cartilagenous septum.

The incision is made through the right nostril irrespective of the direction of the dislocation. The septal cartilage is steadied with a finger on the left side of the nose and the membranous septum is retracted forwards and to the left, so as to outline the anterior border of the septal cartilage. A long nose has a septal cartilage which projects beyond the pre-maxilla, so that the maxillary spine is at the bottom of a deep hole. Two additional incisions at the right

angles to the original incision, so that after under-cutting the centre of the upper lip, at the level of the periosteum, the columella can be retracted to the left and the upper lip retracted downwards.

The operation may be made difficult by dense adhesions to the front of the maxillary spine. The surgeon will then have difficulty to construct the lower channels. The operation field is narrow and troublesome bleeding follows manipulations in the wrong place.

Partial mobilization of the septum at its lower border, can be achieved, by dividing the adhesions between the septal cartilage and the upper border of the maxillary spine. The maxillary spine is then isolated from above, elevating the periosteum on both sides of it from above downwards, towards floor of nose.

The fragment of maxillary spine has been useful to restore the contour of the nasal septum when the nose has a saddle shaped depression as well as septal dislocation.

Complete mobilization of the septal cartilage is achieved after dividing its articulation with the vertical plate of the ethmoid and the vomer posteriorly. It is also essential to divide the attachments of the septal cartilage to the upper lateral cartilages on each side. Then the septal cartilage can move freely from side to side within the nose, being attached only to the mucoperichondrium on the right side of the nose.

Frequently the cartilage is prevented from returning to the midline of the nose, despite adequate mobilization. We have found 2 difficulties requiring special attention.

1. The posterior border of the septal cartilage may overlap the vertical plate of the ethmoid. There is a tendency for the cartilage to overlap the bone, preventing accurate alignment of the 2 structures. Removal of a small strip of cartilage from its posterior border helps to bring the 2 structures together.
2. The septal cartilage itself is often twisted following the injury, thus preventing accurate replacement in the mid-line. Hunter Fry of Melbourne has studied the problem experimentally and clinically. He has brought forward the view that there are within the septal cartilage forces pulling in opposite directions. These forces are balanced, so that the flat surface of the cartilage on both sides of the septum is not disturbed. Injury to 1 surface allows the forces acting on the opposite side to continue unopposed. The result is that the cartilage bends gradually towards the uninjured side. He considered the process was a gradually progressive one, the resulting septal deformity did not become manifest until a long time after the injury. He demonstrated this process experimentally by removing a fragment of septal cartilage injuring the mucoperichondrium on 1 side and then observing the deformity which followed. In another experiment. he attached a weight to the end of the cartilage and showed that the unopposed force within the cartilage could be overcome and the flat surface maintained.

When both sides of the cartilage were incised, the tendency to deformity was avoided completely and he used this knowledge in overcoming the difficulties due to deformity of the septal cartilage.

Complications

1. Bleeding
 - a. During the operation bleeding has not posed serious problems. Adequate pre-medication and local anaesthesia helps to reduce bleeding. Attention to operative technique also assists considerably — Holding the nasal septum in the retractors at first by the surgeon himself and later by a trained assistant, helps to define the anterior border of the septum. The surgeon can then find a bloodless plane between the cartilage and the perichondrium. He holds the sucker in his left hand and the elevator in the right so as to define the tissue planes. The same technique is very helpful when exposing the maxillary spine.
 - b. After operation. Bleeding has not presented a serious problem apart from 1 patient in our series of 50 septal rhinoplasties, who required to have his nose packed to control the bleeding.
2. Swelling of the columella may cause temporary nasal obstruction. The front end of the septal cartilage is secured to a pocket in the columella by 2 silk sutures which pass through the mucoperichondrium and cartilage deeply and are brought out through the skin of the membranous septum superficially and tied in the nostril opposite to the dislocated side. Reactionary oedema or infection through the sutures may cause swelling of the columella.
3. Recurrence of nasal obstruction. This could be due to the caudal end of the nasal septum becoming detached from its position above the columella or to the deformity of the cartilagenous septum being too severe to be corrected.

The advice given yesterday by Dr. Cottle to remove the cartilagenous septum and replace it with a bone graft taken from the back of the nose might be useful in such cases.

When the problem of a twisted septal cartilage has arisen preventing adequate replacement of the septum in the mid-line, incisions through the mucous membrane and mucoperichondrium on the concave side of the cartilagenous septum help to overcome the deformity. The incision may need to be in a horizontal or vertical plane according to the direction and extent of the concavity. Bearing in mind the view of Hunter Fry, I have found that multiple incisions are more effective than a single incision to achieve a flat cartilage surface.

RESULTS

We have performed the septal replacement operation on 52 patients using the technique discussed. Many of our patients were teenagers, the youngest was 13 years old.

The success or failure of each operation was judged by 2 clinical criteria, the subjective improvement of the patient's nasal obstruction and the improved appearance of the nose both inside and outside.

In another 8 patients it was necessary to combine the septal replacement with a formal rhinoplasty operation. The group of 50 septal replacement operations

gave complete relieve in 48 patients. 4 patients were not improved and examination showed that the septal cartilage had slipped from its insertion into the columella.

Of the group of 8 patients in whom the operation was combined with a formal rhinoplasty, 7 were greatly improved, 1 was a failure.

SUMMARY

Nasal obstruction is a very common symptom in an E.N.T. Clinic. It is often caused by deformities of the bony or cartilagenous skeleton especially the septum.

Sub-mucous resection of the septum has usually been advocated but it has several limitations and many patients continue with nasal obstruction after operation. It failed to deal with obstruction by dislocation of the front end of the septal cartilage or by a deviated bony bridge. It often left a floppy septum and sometimes it removed the support of the nasal bridge causing it to fall. Children had to wait until they reached 17 years of age, early resection of the septal cartilage might interfere with normal growth of the nose.

The importance of inspecting the nose from in front and below was stressed in order to make accurate preoperative assessment of the nasal deformity. The nasal speculum exposed the inside of the nose but hid the orifices.

The septal replacement operation is more difficult than the sub-mucous resection. It leaves a straight septum with minimal removal of cartilage, thus not interfering with the growth of the nose in adolescence. It can be combined with a rhinoplasty operation. The operative details are discussed and stress was laid on complete mobilization of the septal cartilage. Permanent bends or twists of the injured cartilage were corrected by incising the mucoperichondrium on the concave side.

The results of 60 such operations were discussed.

RÉSUMÉ

L'obstruction nasale est un symptôme très courant dans les services d'oto-rhinolaryngologie. Elle est souvent causée par des difformités de squelette osseux ou cartilagineux, en particulier du septum.

La résection sous-muqueuse de la cloison est généralement recommandée, mais les résultats en sont restreints et beaucoup d'opérés continuent à se plaindre d'obstruction nasale après l'opération. Elle ne peut résoudre l'obstruction par dislocation de la partie antérieure du cartilage ou déviation de la voûte osseuse. L'opération laisse souvent le septum sans attache et parfois, supprime le soutien de l'arête nasale, entraînant sa chute.

Les enfants doivent attendre l'âge de 17 ans, car la résection prématurée du cartilage septale risque de gêner la croissance normale du nez.

Il est important d'observer la pyramide nasale de face et vue de base afin d'analyser la déformation avant l'opération. Le speculum nasal permet l'examen de l'intérieur de la fosse nasale mais en masque l'entrée.

L'opération qui consiste à reposer le septum est plus difficile que la résection sous-muqueuse. Elle permet d'obtenir un septum droit, avec une perte minime

de cartilage, sans gêner la croissance du nez chez les adolescents. Elle peut être complétée par une opération de chirurgie esthétique du nez. Au cours de la discussion sur les détails opératoires, on insiste sur la mobilisation complète du cartilage septal. Le bombement et la torsion permanente du cartilage sont corrigés par l'incision du mucopérichondre du côté concave.

La discussion porte sur les résultats de 60 opérations de ce type.

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