short and necessarily sketchy paper as an appeal for the thorough investigation of the condition of the nose and nasal accessory sinus in those cases producing ocular signs and symptoms, the ætiology of which is obscure, and which do not rapidly react to treatment. Indeed, one may well bear in mind the precept contained in those well-known words—

“Defer not till to-morrow to be wise,
To-morrow’s sun to thee may never rise.”

ÆTIOLOGY AND. OPERATIVE CURE OF COLLAPSE OF THE ALÆ NASI.¹

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UNDER normal conditions collapse of the alæ nasi may be produced by forced inspiration; this causes considerable rarefaction of the intra-nasal air, which, as it cannot be sufficiently compensated for by the stream of inspiratory air, allows the external atmospheric pressure to predominate and forces the alæ nasi against the septum. Three factors tend to counteract this force: (1) The normal tension of the tissues composing the alæ nasi; (2) the alar cartilage, which lies with a slight internal concavity in the nasal wing, and possesses an appreciable amount of firmness and elasticity. During normal quiet inspiration these forces are sufficient to maintain a patent nasal aperture, and to guarantee free nasal respiration. Matters are, however, different when, as will shortly be considered, pathological changes are present. In such cases the nasal wings will be compressed even during quiet inspiration, the resulting respiratory disturbances being, according to Schmidhuisen, sometimes so intense that the patient is obliged to open the nasal aperture with his hand.

Considerable embarrassment may, however, be produced by a partial alar collapse. It need only be mentioned that this condition of the alæ nasi is a hindrance to a quick and effective performance of the respiratory function, and that, to compensate for this, mouth-breathing has to be adopted. There is produced a small but persistent negative pressure in the nose, and this, as

¹ The original article appeared in the *Archiv f. Laryngologie* of April, 1910.

previously pointed out by Moritz Schmidt, eventually leads to chronic hyperæmia and secondary hypertrophy of the nasal mucous membrane.

The subjective symptoms vary considerably in different cases, even under similar pathological conditions. Many people afflicted with this form of obstruction suffer considerably, whilst others seldom or never complain. We cannot be altogether surprised at this, seeing that many people never become aware of even pronounced nasal obstruction, because they have accustomed themselves to the condition from childhood, and have never learnt the normal relation of the nose to the respiratory act. Such patients only seek medical advice on account of secondary affections of the larynx, pharynx, bronchi, ear, etc.

Text-books, as a rule, refer only very briefly to the pathological conditions resulting from collapse of the *alæ nasi*. This subject has been almost entirely neglected by Stoerk, Mackenzie, Schech, and others. Moritz Schmidt states that "collapse of the *alæ nasi* is met with in individuals who have been breathing either incompletely or not at all through the nose for a prolonged period. In this manner there is produced an atrophy of the *levator alarum nasi*, which do not at a later date regain their function if the nasal obstruction be overcome. It is also not infrequently observed in those who are seriously ill or dying, and adds considerably to their embarrassment." The condition is likewise briefly referred to by Gaule in Heymann's text-book. The therapy of alar collapse is extensively dealt with by Onodi and Rosenberg, though they say little or nothing of its ætiology.

For some years past I have devoted increased attention to this condition, partly because of some difficult cases that I have met with, and partly because it appears to me to be a condition which merits closer attention. By careful observation I have learned that the collapse may be caused by any of those parts which enter into the formation of the nasal vestibule, that is to say either by the *alæ nasi* or by the cartilaginous or membranous septum. In some cases the floor of the nose and the anterior inferior nasal spine are at fault, whilst in others the ætiological factor may be supplied by an anomalous position of the triangular cartilage.

In the *alæ nasi* the chief factors to be considered in the production of collapse are atrophy of the levator muscles, slackness of the subcutaneous tissues and the alar cartilages, or too pronounced a curvature of the latter from above downwards. Though the first two factors have been often observed I have been unable to find a

single instance where the excessive curvature of the cartilage has been taken into account. In this condition—which may often be appreciated by external examination owing to the deep groove present above the *alæ nasi*—the upper border of the cartilage projects markedly into the nasal vestibule and may often cause the alar and septal mucous membranes to lie in contact. In this region it is frequent to find a serous or muco-purulent secretion which may be responsible for attacks of sneezing or a “running” from the nose. In such cases it is of the utmost importance that the examination of the nose should in the first instance be conducted without a speculum, or if such be used the branches of the instrument should be opened as little as possible, otherwise the existing relations of the parts will naturally be quite altered. If, now, the upper border of the alar cartilage be found to lie in opposition with the septum, a collapse of the *alæ nasi* may often be produced by simply getting the patient to inspire through the nose. Sometimes in a small nose this condition may be brought about by abnormal curvature of the triangular cartilage, the inferior border of the latter projecting sharply below. In these cases, also, secretion—either serous or purulent—may be seen between the approximating surfaces.

Though it is commonly recognised that subluxations and deviations of the cartilaginous septum are frequent causes of collapse, the anomalies of the membranous septum are seldom considered in this respect. Under normal conditions the latter forms a tense fold of skin which stretches in a straight line from the point to the floor of the nose. In its posterior inferior part it frequently broadens out so as to assume an almost conical shape. With regard to the latter there occur very considerable variations. This conical thickening sometimes starts immediately behind the point of the nose, and attains such dimensions that it causes an appreciable diminution in the width of the nasal vestibule on both sides. This thickening is rarely due to hyperplasia of the subcutaneous or submucous tissues. More frequently it is caused by a broadening and anterior superior projection of the antero-inferior nasal spine. In other cases it is due to an abnormal position of the short or septal crus of the alar cartilage, which normally curves round in the membranous septum and runs in a sagittal plane. Should this spur happen to have a marked lateral projection, it forms together with the subcutaneous tissues (which in such cases are usually in excess) a considerable thickening of the membranous septum, and in this manner causes so marked a

diminution in the calibre of the nasal vestibule that the distance between the alæ nasi and the thickened cartilage may not exceed 1-2 millimetres.

Alar collapse is more rarely due to exostoses which spring from the floor of the nasal aperture.

This affection has up to the present been most often treated by getting the patient to wear some sort of support. Of such the nasal dilators of Feldbausch and Schmidthuisen have proved themselves most generally useful. Guye uses small pieces of drainage-tube, while Jankau recommends an olive-shaped support made of vulcanite, with openings at each end. Kafemann uses as an obdurator an oval conical metal tube which is provided with an arrangement to regulate the air-current.

None of these apparatus are efficient in removing the disturbance, and though they serve more or less as an orthopædic help, they are unable to ensure the normal play of the nasal wings, whereby the inspiratory air is regulated at the nasal aperture during the respiratory act. The nasal wings are converted into a tense covering for the obdurator. The supports of Feldbausch are the only ones which leave the alæ nasi tolerably free to act; they are, however, visible externally, and patients refuse to wear them except in very severe cases. Heermann sought to overcome the difficulty occasioned by the want of a suitable apparatus by dilating the navicular fossa at the anterior part of the vestibule with a conical piece of wool soaked in vaselin. But none of these methods render adequate aid, and should only be employed when the patient is ready to endure any amount of annoyance rather than subject himself to the most insignificant operative interference. In my opinion, however, it is the surgeon's duty to permanently rid the patient of his trouble, and I believe that this is never a difficult matter.

When examining the nose it is of primary importance to determine which of the structures surrounding the aperture is responsible for the alar collapse. Deficient action of the levator muscles can only be remedied when the nasal aperture is free and the muscle can be functionally exercised; it therefore is only of secondary consideration. When the obstruction is caused by excessive curvature of the alar cartilage, so that the upper border of the latter approximates the cartilaginous septum, I operate as follows: Having carefully incised the alar mucous membrane down to the cartilage by an incision running slightly below the approximating edge, and having then carefully dissected the

membrane and perichondrium from the edge, I remove so much of the upper edge of the alar cartilage that the upper part of the latter comes to lie at a sufficient distance from the septum. The mucous membrane may either be stitched up or opposed by means of a tamponade. If the piece of cartilage removed is unusually large, it may be advisable to remove a slender strip of mucous membrane in order to avoid a subsequent redundancy. In a similar manner I have removed the inferior edge of the alar cartilage if it happened to be in apposition with the septum. In the description of this little operation it is to be noted that the incision is not made in the free border of the cartilage, but a little bit removed from the latter, since the cartilaginous border is always firmly embedded in the mucous membrane. By working from below upwards the separation of the structures is almost as easy as separating the muco-perichondrium from the quadrangular cartilage when performing the subperichondrial resection of the latter.

In cases where the alar cartilage is very delicate and yielding it is unable to offer sufficient resistance to the atmospheric pressure. In order to increase the resistance of the *alæ nasi* Menzel advises the injection of paraffin into the nasal wings. Such a proceeding does not appear to me to be justifiable, because the parts in question are so thin and delicate that even the smallest quantity of paraffin more than is absolutely necessary would cause a bad result cosmetically, and a paraffin syringe may sometimes prove a very unreliable instrument even in experienced hands. Eckstein, on cosmetic grounds, has proposed an operative method for dealing with retracted scars of the *alæ nasi*. He makes a small incision at the lower part of the sulcus alaris. From this he passes a fine silver wire along the free edge of the nasal wing, passing underneath the retraction and emerging near the tip of the nose. The suture is then re-introduced at its joint of exit and carried in a direction upwards and outwards in proximity with the upper border of the lateral cartilage, and, as the case may be, beneath the retraction; the wire is now re-introduced at its second point of exit and carried subcutaneously to its original point of introduction, where the two ends of the suture are twisted, cut short, and buried. The original wound is now stitched up. In this manner a triangular suture of silver wire is buried in the tissues, and I have been able to satisfy myself that it serves its purpose well. There is scarcely any external scar left after this operation. To attain the same object, however, it appears to me to be more practical to make an incision on the internal surface of the nasal wing, and from this.

working with a fine scalpel, to form a small pocket on the lateral aspect of the alar cartilage. In this pocket it is possible to place a fine silver support shaped somewhat like the hand of a watch. This support, which should have a slight outward convexity in conformity with the shape of the nasal wing, had best be specially prepared for each case. The primary incision is finally sutured.

If the alar collapse is due to subluxation or deviation of the septal cartilage the latter should be resected by one of the methods now generally adopted. It is also possible by working from the anterior nasal aperture to remove exostoses of this region as well as thickening of the antero-inferior nasal spine. The lower bony margin is freed by an incision made at the junction of the skin and mucous membrane, the mucous membrane and the periosteum reflected, and the disturbing bony projection removed with chisel and bone forceps.

The method of procedure is slightly more difficult when the nasal aperture is obstructed by the thickening of the membranous septum described above. In such cases I proceed as follows: The incision is made at the juncture of the skin and mucous membrane, parallel to the free edge of the membranous septum (if the cartilaginous septum is to be resected at the same time, the bow-shaped incision recommended by me, and reaching forwards may be used for the double purpose). The lower part of the membranous septum is now turned outward, and the thickened parts (subcutaneous tissue or cartilage as the case may be) excised and the incision sutured. If the cartilage is also prominent on the other side the same operation may be repeated to a greater or lesser extent on this side. At the conclusion of the operation I pass a suture through the postero-inferior part of the membranous septum, then carry the needle over a piece of vioform gauze to the point of the nose piercing the latter, and tying the two ends of the suture over a second piece of gauze on the other side. The purpose of this suture is to prevent the stitches from cutting out, and to keep the two sides of the reduced membranous septum firmly in apposition. The stitches may be removed in from two to four days. The result is always excellent, both cosmetically, and having regard to the object for which the operation is performed.

During the six years that I have devoted my attention to these disturbances I have not been very often compelled to have recourse to the small operative manipulations just described. They have, however, given me surprisingly good results in a number of severe cases. I have never found it necessary to subsequently

recommend the patient to wear a dilator, and in some cases patients who have previously reluctantly worn these appliances have been able to quite dispense with their use. Intra-nasal irritation and increase of the sneezing reflex are often cured by the operations described. I believe that the conformity of the anterior nasal aperture demands considerably more attention on our part, and I warmly recommend in suitable cases the insignificant but often very useful operative methods described above.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

May 5, 1911.

DR. P. WATSON-WILLIAMS, *President, in the Chair.*

CASES ILLUSTRATING THE TREATMENT OF FRONTAL SINUS SUPPURATION.

CASE 1.—SHOWN BY DR. STCLAIR THOMSON.

Mrs. M——. This patient was exhibited before the Section on December 4, 1908, fourteen days after a radical Killian operation on the left frontal sinus.¹ The left antrum was operated on at the same time, and a suppurated ethmoidal region cleared away; the sphenoidal sinus was explored and found healthy. A radiograph was useful by showing that the left frontal sinus crossed the middle line, and that there was an orbito-ethmoidal gallery running outwards behind the bridge. The patient begged to have the operation done on account of persistent headache. She has not been up for inspection until the present occasion.

The case is shown as a sample of an excellent result, both in regard to the cosmetic result and the cure of all symptoms.

CASE 2.—SHOWN BY DR. STCLAIR THOMSON.

Mrs. W——. This patient was operated on some years ago for suppuration in all the accessory sinuses of the right side. Her head symptoms were at one time so severe that she was first admitted to the Queen's Square Hospital.

The case is exhibited to illustrate the complete cure of suppuration, and the relief of all symptoms. But the cosmetic result has been somewhat marred owing to the accidental fracture of the Killian bridge during operation. The opening into the sphenoidal sinus is well seen.

¹ JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, vol. xxiv, p. 35.