REMOVAL OF ADENOIDS—A SIMPLIFIED TECHNIQUE

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Of the so-called "minor surgical procedures" in children, the complete removal of adenoid hypertrophies must rank as the most important, and, being a blind manoeuvre, also the most difficult. Those who perform this operation frequently will agree that a certain knack must be acquired in order to sweep the entire adenoid mass out of the rhinopharynx in one clean stroke. The adenoid operation is one of those rare survivals in surgery where a difficult technique has been developed to perfection in order to overcome an inherent structural fault of a stereotyped instrument. Even those who have regular opportunities of performing the operation exhibit a lack of certainty. It is essentially a planing operation, the adenoid mass being shaved off from its broad attachment in one clean sweep. Its ancient label of "curettage," the method used very long ago, describes the modern operation as fittingly as it would the removal of a layer of skin for a Thiersch graft. The instrument used should be called a plane. If an instrument is used as a rake or scraper, it must have a certain shape best suited for this purpose; when this instrument is to function as a plane, however, a totally different set of mechanical factors is brought into play, and the old shape must be modified to suit new conditions.

The "Knack" of the Operation

With the ordinary instrument the cutting blade is $1\frac{1}{2}$ to $3\frac{1}{4}$ inch above the line of force as transmitted through the handle (Fig. 1). In order to "hug the post-

FIG. 1.—Outline of Sir StClair Thomson's modification of the Gottstein curette. A, Cutting edge; B, Axis.

nasal wall," an essential in effecting the complete removal, the cutting edge describes a curved path corresponding to the curvature of the particular post-nasal space which is being operated upon (Fig. 2, (a), (b), (c)). The knack of

FIG. 2.—Illustrating variations of curvature of the post-nasal wall.

the expert operator is that he is able to transmit adequate pressure in such a manner that the resultant, speaking mechanically, of the force he applies and of the opposing force of the blade, which is at a higher level in the post-nasal space, will give the cutting edge the desired curved direction; it also signifies that the blade is always presented at an efficient cutting angle. During the opera-

tion the handle rotates upwards, the centre of rotation being the edge of the blade. The latter must be made to describe a path corresponding to the curvature of the rhinopharynx if complete removal of adenoids is to be achieved. That is the crux of the matter. In Figure 1, A represents the edge of the blade and is the pivot around which the instrument must rotate. There is very little latitude here for an allowable margin of error. The completeness of removal will depend upon how near to point A the centre of rotation has been kept. At A the removal will be complete, whereas the further it gets towards B the more incomplete will be the removal. As B is in line with the axis of the handle there is a constant tendency on the part of the instrument to pivot on this latter point. Furthermore, the curvatures of the different post-nasal spaces (Fig. 2) vary; some are flat, others more recessed, all calling for some slight modification of pressure and rotation. Only one who constantly does this work can be expected to be able to compensate for all these factors.

My attempts at teaching this technique convinced me that the difficulty or inability on the operator's part to guide the blade accurately down the curvature was primarily due to the fact that the blade and handle were in two different planes. It seemed to me that there was no reason whatever why the blade and the handle should not be placed in the same plane. I therefore instructed Messrs. Mayer and Phelps to make the instrument illustrated (Fig. 3) for me. The cutting edge of this adenoid

FIG. 3.—Outline of the author's adenoid plane. Note that the cutting edge (A) is in the axis of the instrument.

plane is in direct continuity with the axis of the handle. In order to clear the soft palate, that part of the instrument between the head and the handle is curved downwards. The major technical difficulties of the operation vanish with this construction. This plane cannot rotate about any point other than the edge of the blade, corresponding to A in Figure 1. There is no need to acquire any knack, because the operation has been converted from an indirect into a direct cutting manoeuvre. The surgeon need not direct the blade. The instrument will guide itself down the post-nasal wall, as it must do, and will adapt itself automatically to the varying curvatures of the different post-nasal spaces. All that is necessary is

to apply moderate pressure throughout the sweeping-down movement. This also means that whatever the position of the instrument the blade is always at the cutting angle. The blade is set at an angle of 45 degrees to the handle, which I have found to be most suitable. In the older types of instrument this angle seems, in some cases, to have been determined by the whim of the

particular maker. I have found varying angles in the different sizes of the same make. In the plane described I have insisted on uniformity in this matter. This instrument has been in continuous use at the Queen's Hospital for over eighteen months, and even those attempting the operation for the first time rarely fail to clear the adenoids out of the rhinopharynx in one sweep.

Sharpness of the Blade

This is a matter of supreme importance. As the adenoid mass is shaved off, and not curetted, it follows that the blade must be razor-sharp. Actually the metal of the instrument is not an ideal medium to take and retain such an edge. The metal of the blade is in one piece with the rest, and therefore cannot be tempered highly lest the whole should become too brittle. If, however, the edge is set very frequently it will serve its purpose well. The surgeon can do this for himself with a small oilstone. A blunt or jagged edge is liable to tear into and strip the mucous membrane. Copious and often prolonged bleeding occurs when the pharyngeal venous plexus and branches of the ascending artery are involved. If, in addition, excessive force is used, fibres of the superior constrictor muscle may be detached. Unsightly scars and tags, occasionally followed by post-nasal dryness, are then to be expected. Messrs. Allen and Hanbury have made a plane to my design (Fig. 4) where the blades are

FIG. 4.—The author's adenoid plane with removable blades. The figures indicate points of support for the blade.

removable and interchangeable, with six spares carried in the handle. These blades are cut-down commercial safety razor blades, which, being spring steel of correct temper, have a superb cutting edge, and make this an ideal instrument to use. The safety cage is so designed as to hold the blade on both surfaces and all four sides—nine points in all—and is therefore absolutely secure. The spare blades are naturally inexpensive. One can always be certain of a razor edge and a clean operation.

Anaesthetic

It cannot be stressed too strongly that a deep anaesthesia is not only unnecessary, but undesirable; it should be on the light side, and the coughing reflex must have returned before the operation is commenced. The tonsils are usually enucleated beforehand by guillotine or dissection, where anaesthesia must be sufficiently deep to relax completely the musculature of the throat. One can safely wait until the anterior and posterior pillars and soft palate begin to contract, as one is operating behind them and against a firm base. If the bloodless method of enucleation is employed, as described in my paper (*British Medical Journal*, 1929, i, 988), the operative field is clear of blood and the moment of the returning reflexes is immediately seen. Where swabs are being pressed into the throat the commencement of retching and gagging indicates the moment to commence adenectomy. Only where the surgeon intends to control

the immediate haemorrhage by pressure is deeper anaesthesia permissible, when, as soon as the adenoids are removed, the palate is retracted forwards and the post-nasal space is packed with gauze wrung out in sterile liquid paraffin and moistened with ferric chloride solution. This packing is left in for approximately two minutes. When the packing has been removed the soft palate is again pulled forward, and the rhinopharynx can be inspected.

The Operation

With regard to the position of the patient, the important thing is that the head must be at a lower level than the larynx to avoid the aspiration of blood. The following are the stages of the operation (Fig. 5):

1. The post-nasal space is carefully examined with the finger to determine the size of the mass and extensions. Under good illumination the instrument is inserted behind the soft palate and pushed upwards until it touches the vault.
2. The handle is dropped towards the chest, so that the back of the cage rests against the posterior edge of the nasal

FIG. 5.—The simplified operation. Note that the blade "hugs" the post-nasal wall at every stage. (Drawn to scale.)

3. Applying moderate pressure, the blade is swept down septum and the blade engages the upper portion of the adenoid mass in the vault.

the post-nasal wall by raising the handle towards the face.

4. When the cage appears from behind the palate it is swept out of the mouth. This detaches the adenoids, and the whole mass will be found in the cage. The movements are, of course, continuous.

The operator must keep strictly in the mid-line or long axis of the body. There is then no risk of injury to the Eustachian cushions. Never more than moderate pressure is required if the blade is keen. I have seen shavings from the body of the atlas where the operator has been too heroic. This did not seem to be followed by anything worse than a transient feeling of stiffness in the neck. The adenoid mass occasionally extends laterally into the fossae of Rosenmüller. This is ascertained beforehand by palpation. I have found that most of it can be coaxed into a more central position by breaking down adhesions with the finger, and then removing them together with the central mass. I am indebted to Sir James Dundas-Grant for this hint. Where this is ineffective these extensions must be removed by carefully inserting the instrument to one or other side of the mid-line behind each Eustachian cushion, and proceeding as before. The bleeding is usually brisk and of short duration, ceasing spontaneously. Where it appears to be excessive, a blunt instrument, combined with too much force, is usually to blame, and packing may be necessary.