from six to twelve hours, rarely eighteen hours after the injection, and lasted twelve to eighteen hours, according to its severity. In no case was it suggested to the patient what he or she might expect in the way of a reaction; the constitutional symptoms were elicited by careful questioning, avoiding all leading inquiries. In 14 of the cases out of the 28, 50%, a definite reaction was obtained after the second dose of 1 mgm. of tuberculin which goes to confirm the statement made above that a dose of 5 or 8 mgm. is often quite unnecessary and, if given as an initial dose, is in many instances very dangerous.

The proper disposal of poor patients who react to tuberculin is not by any means an easy matter. While we are convinced that these are the patients who, if left untrained, are later to become openly tuberculous, it is often very hard to persuade them that there is urgent present need of strenuous measures. If the intelligence of the patient warrants it, in some cases we carefully explain the situation, tell the patient what he must do and keep him under observation in a class for a period of months until he seems to be in perfectly good condition again. All patients are expected to report once a month after they have left the class. We try to get into Rutland, the State Sanatorium for consumptives, those who have no facilities for carrying on home treatment. On their return they report at the class meetings once a month. Of our cases, 9 went to Rutland, 10 were admitted to classes, 3 were lost track of, and the remainder were disposed of as was found best. In an examination of Paris school children, Grancher found 15% to be in what he terms the "pre-tubercular stage." There is no reason to believe that American schools, at least in the city, would make a better showing. It is among this class that the tuberculin reaction in addition to other means of diagnosis is of great value. A few months' treatment at this stage may save many of these from becoming consumptives later on.

In conclusion then we believe:

- (1) That tuberculin is an agent of great value in the early diagnosis of tuberculosis.
- (2) That it should be used only as a last resort after all other means of making a diagnosis are exhausted.
- (3) That it should be used only in carefully selected cases as specified above.
- (4) That it should be given by men properly trained and qualified to do this work.
- (5) That used in selected cases in the initial dose of not over .1 mgm., it is not in any way dangerous.
- (6) That it is perfectly practicable to use tuberculin to advantage and to get good and trustworthy results in an out-patient department among ambulatory patients, but it would be far better to have beds in the hospital for this purpose.
- (7) That it is much easier to get good results and to give tuberculin properly if the patients are handled in groups or classes.
- (8) That if a patient has a history and signs that lead one to suspect tuberculosis and in addi-

tion to this reacts to tuberculin, he should be treated as any other early case of consumption is treated, and furthermore the exact state of affairs should be explained to the patient or to his friends.

TECHNIQUE OF SUBMUCOUS RESECTION OF NASAL SEPTUM.*

BY G. H. POWERS, JR., M.D., BOSTON.

THE purport of this paper is to present to you the technique of the submucous operation as done in the Massachusetts General Hospital Throat Clinic.

Indications. — The primary indication for this operation is nasal obstruction, partial or complete. In cases where there is not sufficient deviation to produce *per se* obstruction to nasal respiration and yet the breathing space is materially encroached upon by the above condition and an hypertrophied lower turbinate, the tendency at the present time is to correct the faulty septum first. The turbinate may later be trimmed that it may more perfectly conform to the resultant change in the size of the affected nasal cavity.

The age of the patient must be taken into consideration. If the cause of deviations of the septum nasi lies, in a great measure, in developmental anomalies of the facial bones (a generally accepted theory), it would seem justifiable to defer corrective measures until the parts in question have attained their full growth, or until about the time of puberty. In cases of obstruction sufficient to cause annoying symptoms, this consideration would naturally be overlooked. Question of operation on the deviation of traumatic origin is not influenced by this contraindication. The existence of any of the acute infectious diseases, secondary syphilis, or active local tubercular processes are absolute contraindications. Decision to operate upon a hemophilic should be guardedly reached.

Anesthesia. — The anesthesia most in use in this clinic is cocaine hydrochlorate 4% to 10% in solution with equal parts adrenaline chloride 1-1000. Pledgets of cotton are dipped into this solution and rubbed over the mucous surface to be cocaineized. The patient will suffer less inconvenience if a hearty meal is eaten a short time before operation.

Preparation. — Very little preparation for the operation is necessary. The face may be thoroughly washed, the surrounding parts scrubbed with soap and water, and the usual aseptic precautions taken. A mask of several layers of gauze with a central opening for the nose will be found very convenient for both patient and operator. This mask is held in place by two strips of tape attached to the inner surface and tied around the head, one at the level of the forehead, the other passing just below the tip of the nose.

Position. — This is purely a matter of preference some operators being accustomed to

* Read at a meeting of the New England Otological and Laryngological Society, March 16, 1906.

operating upon patients in the recumbent or semi-recumbent position, while others prefer to have the patient sit upright in a straight-backed chair with a headrest.

Instruments. — The necessary instruments are: applicators, probe, specula (ordinary and medium Killian), knife, elevators (Freer and Jansen), Ballenger knife, biting forceps (Freer, Gruenwald, Jansen), chisel, gouge, mallet, hook-needle with sutures, scissors, angular forceps.

Operation. — The single anterior incision is used, the cut being made as far anterior as practical. This incision is occasionally modified to meet the requirements in different cases by a horizontal cut along the base of the septum, and by an extension of the original incision across the floor of the nose, the object being in each instance to afford readier accessibility to the operative field in cases complicated by spurs and basal protuberances.

The incision passes through mucosa and perichondrium and is, in the average case, from 1.5 to 2 cm. long. An elevator is now employed to dissect perichondrium and mucosa over as great an area as indicated. Freer's elevator will be found most useful in starting the dissection, the larger instrument of Jansen being used for the remainder, as with it there is less likelihood of injuring soft tissue. The cartilage is now incised in the line of original incision, care being taken not to perforate the opposite perichondrium and mucous membrane. The latter are now elevated in the same manner and to the same extent as above.

The medium Killian speculum is now inserted, the blades opening against the two layers of perichondrium, having between them the cartilaginous septum.

The removal of the requisite amount of cartilage is now accomplished with the Ballenger knife, punch or gouge, the former being preferred whenever practical. According to the advice of Menzel¹ a bridge of cartilage above from 1 to 1.5 cm. in width should always be left for support to the integument in preserving the external contour of the nose. In using the Ballenger knife, the first stroke is made upwards and backwards, the downstroke following along the synchondrosis of the cartilage with the ethmoid plate and the vomer, the final direction being along the lower border of the quadrangular cartilage. The excised portion of cartilage is readily removed through the anterior opening with a pair of forceps.

In case of basal protuberances, chisel gouge or biting forceps may be employed for their removal. For deviations of the bony septum the biting forceps of Jansen, Gruenwald and Freer are the most serviceable instruments. In removing portions of the ethmoid plate and vomer, the support afforded the nasal bones must always be borne in mind, and while we do not know just what proportion of this structure may with impunity be removed, it seems safe to remove

one half. Future experiment may justify us in removing more than this, but at present the tendency is to allow at least one half of the bony septum to remain intact. The usual location for spurs in the posterior portion of the septum is along the border of the vomer. Such ridges are readily removed with a gouge, chisel, or biting forceps. When the gouge and chisel are employed great care must be observed in tapping with the mallet not to exert sufficient force to fracture the vomer.

Having removed the obstructing portion of the septum, the field of operation must be carefully inspected and probed in order to detect loose fragments of bone and cartilage which have been overlooked. Their removal is essential to insure a smooth surface of the mucosa and perhaps primary union.

Coaptation of the edges of the wound may be maintained by sutures or by packing. Sutures are inserted with the hook needle of Jansen, holding the loose flap of soft tissue with forceps, the needle passing through mucosa and perichondrium not less than one sixteenth of an inch from the free border and again through the anterior mucosa and perichondrium which have been left undisturbed. Silk, silkworm gut or horsehair may be used for suture material. A pair of forceps will be necessary in tying the suture.

The nose is now packed, usually with cargile membrane wrapped around a tampon of absorbent cotton. Strips of sterile gauze or plugs of cotton may be used for this purpose. The object of packing is two-fold: (a) to retain the layers of perichondrium in apposition and (b) to prevent secondary hemorrhage and the filling up of the operative field with blood. It is necessary to lightly pack the side opposite to that operated upon for the same reasons, though in this instance a lesser amount of packing is necessary, as it is possible to attain the desired result and allow at the same time for breathing space. A few strips of narrow gauze placed between the lower turbinate and septum will suffice, and if it does not reach to the floor of the nose will not obstruct the breathing. The medium Killian speculum should be used to protect the operative wound during the process of packing.

The after-treatment is very simple, consisting merely, in uncomplicated cases, in removing the packing at the end of twenty-four hours and keeping the nasal cavity clean. Aristol powder is usually insufflated for the first two days in order to reduce as much as possible post-operative hypersecretion which is very apt to follow when packing is omitted. Sutures as in other locations are removed in from three to five days. For any subsequent swelling Argyrol 10% to 15% or Protargol 4% proves very efficient. Primary union insures recovery in three to five days, a longer after-treatment resulting from granulations forming in the space left by imperfect coaptation of edges of the wound, or other complication.

The result of a successful resection is sufficient and equal breathing space in both nasal cavities,

¹ See White on Resection of Nasal Septum, BOST. MED. AND SURG. JOUR.

in so far as the septum is concerned. The untoward results are:

(a) Permanent perforation. This may be due to accidental removal of a portion of one or both layers of perichondrium and mucosa, or to subsequent sloughing from infection, etc. Sloughing has been known to follow the application of 1-1000 adrenalin chloride when the nose has been packed with saturated pledgets before operation.

(b) Hematoma with resultant fibrous tissue formation or subsequent abscess formation between the perichondrial layers.

(c) External deformity. Depression following too extensive removal of the bony septum or possibly in those cases in which no bridge of cartilage is left superiorly as previously mentioned.

VOCAL NODULES IN CHILDREN.*

BY A. COOLIDGE, JR., M.D., BOSTON.

I BRIEFLY report this case, not because it is unusual, but because similar cases occur not very infrequently, and are often overlooked. The larynx in children is not always easy to see, and the hoarseness is ascribed to inflammatory conditions, adenoids, or some other similar trouble, resulting in a wrong prognosis or unnecessary treatment.

A girl, ten years of age, was brought to the Out-Patient clinic on account of hoarseness of some years' duration. It was first noticed five years ago, after she had acquired a habit of speaking in a loud voice on account of the deafness of a companion. At about this time her adenoids were removed, but without changing the character of her voice. This hoarseness varies much on different days, and even at different times on the same day, but the voice has at its best a slightly harsh sound. This harsh or cloudy character of the voice is noticeable in the speaking voice even more than in the singing voice. These are practically all the symptoms. On examination nothing essentially pathological is to be found except two pearly white nodules one on the border of each vocal cord between the anterior and middle thirds, a typical picture of so-called singer's nodes, or vocal nodule.

It is not my purpose to say anything about the nomenclature, etiology, pathology, or treatment of the nodules as seen in the adult, for an account of which I need only refer to F. I. Knight,¹ Chiari,² C. H. Knight,³ Miller,⁴ Cordes,⁵ and especially to a discussion on the subject at the International Medical Congress of 1900 in the section of Laryngology.

In the description of singer's nodes in our textbooks, and in papers on the subject, their occurrence in children is often not mentioned, and it is implied that they are found almost exclusively in adult singers. On the other hand in the discussion mentioned above, Chiari says that they are not uncommon in children; Garel and Bernoud from a study of 144 cases conclude that they are very frequent in children. C. H. Knight

quotes one of Murray's cases as only seven years of age.⁶

In my experience vocal nodules are not infrequently seen in children, and they may appear as early as four or five years of age. The symptoms vary from slight huskiness to distinct hoarseness of the voice, varying at different times as the size of the nodules vary, becoming worse with fatigue, excessive use of the voice and with colds or other local inflammation.

The etiology is undoubtedly similar to that in adults, — a faulty use of the voice, except that, whereas in adults it is frequently due to an abuse of the singing voice, in children it is probably caused by constant shouting and loud talking. If we listen to some children at play, it is surprising that their vocal cords stand the strain as well as they do. As in the case of adults, nodes are an infrequent result of abuse, but when they once appear they tend to persist. In children they get little chance for rest, and are themselves a source of irritation. They may be due to enlargement of glandular tissue, similar to the enlargement of the tonsillar ring, disappearing with the involution of this structure.

The diagnosis is easy if the vocal cords can be seen. The nodes are generally bilateral, and situated at about the junction of the anterior and middle thirds of the cords. They appear as small white excrecences on the free edge of the cords, exactly opposite each other. As the straight line of the cords is broken by these projections, their proper apposition in phonation is interfered with, with a resulting lack of clearness in the tone. If the larynx is inflamed or strained the nodules may become temporarily larger, with resulting increase of hoarseness.

Of the prognosis, I cannot speak with any degree of certainty. The nodules often persist for years, but I am inclined to believe that they often disappear during adolescence, especially in boys at the time of the change of voice. At this period the larynx grows, and the local conditions change, so rapidly that it is very probable that these local points of thickening disappear in the process. I have certainly seen the nodes much more frequently in boys than in men.

For treatment, rest and the proper use of the voice are the essential points. Even if the nodes do not entirely disappear, they become less prominent and the voice is improved. Rest of the voice with many children is not easy to enforce. I doubt whether anything is accomplished by local applications. Removal of the nodes, which may be indicated in an adult, is much less frequently so in children; not only is it much more difficult to do without danger of injury to the cord, but as there is a hope of the disappearance of the nodes in adolescence, it is well to wait until after this period before undertaking it.

A SCHOOL of malingering has been discovered in Rome in the course of inquiries made by insurance offices in regard to claims for injuries said to be the result of accident.—*American Medicine*.

* *Loc. cit.*

* Read at a meeting of the New England Otological and Laryngological Society, March 16, 1906.

¹ New York Med. Jour., Dec. 1, 1894.

² Arch. für Laryngol., xi, 415.

³ Laryngoscope, November, 1901.

⁴ *Ibid.*, November, 1902.

⁵ Arch. für Laryngol., xiv, 215.