THE

JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOLOGY.

VOL. VIII. DECEMBER, 1894. NO. 12.

Original Articles are accepted by the Editors of this Journal on the condition that they have not previously been published elsewhere.

Twenty-five reprints are allowed each author. If more are required it is requested that this be stated when the article is first forwarded to this Journal. Such extra reprints will be charged to the author.

The Editors are not responsible for opinions expressed in original Articles or Abstracts in this Journal.

Editorial Communications are to be addressed to "Editors of JOURNAL OF LARYNGOLOGY, *care of F. J. Rebman, Albion Chambers, 11, Adam Street, Strand, London, W.C."*

TURBINAL VARIX.

By WYATT WINGRAVE, M.R.C.S.,

Assistant Surgeon Central London Throat and Ear Hospital.

Definition.—Turbinal varix may be defined as a particular form of hypertrophy which involves the posterior half of the inferior turbinal body, and characterized by a permanent distension of the venous sinuses.

Morbid Anatomy and Pathology.—Nasal obstruction with catarrh is usually referred to under the comprehensive term hypertrophic rhinitis, which embraces nearly all forms of thickening of the mucous membrane. But as there are many varieties of hypertrophic rhinitis, varying in degree from simple swelling to localized accentuations constituting polypi, it will be expedient to classify them according to the predominating morbid changes and in their order of frequency, under four chief forms, viz. :—

1. Vascular.
2. Mucoid.
3. Lymphoid.
4. Glandular.

In the simple and temporary cases, each or all of these changes may be found—it is therefore somewhat difficult, even microscopically, to decide which variety is represented ; but when the disease assumes a chronic or permanent character certain features will predominate and readily determine its nature. It is to a special form of the vascular group that your attention is now directed, which, although occurring occasionally in the middle turbinal, and even in the septum, will be found to constitute a disease almost peculiar to the inferior turbinal itself.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

A glance at a normal inferior turbinal will at once throw some light upon this peculiarity. The anterior two-thirds or half appears perfectly smooth, but the posterior portion and lower border presents a striking and sharply defined contrast, being rough, swollen and wrinkled, even after soaking in spirit.

Serial sectioning equally accentuates the contrast, for whilst the smooth region is characterized for the most part by the presence of glandular and lymphoid structure, the wrinkled part is mainly occupied by cavernous vascular spaces lined by epithelioid plates. These vascular channels, the "Schwellkorpe" of Zuckerkandl, are surrounded by several layers of visceral muscle fibres arranged for the most part in circular and longitudinal directions, whilst some form a series of interlacing bands continuous with obliquely disposed bundles which traverse the intervening connective tissue.

Many writers seem to have entirely ignored these muscle fibres; even so high an authority as Greville Macdonald describes the venous sinuses as "consisting of a thin layer of connective tissue apparently not elastic and lined with endothelium."[1] He further states that he failed to find muscular fibres in the trabeculæ. This oversight is probably explained by the fact that specimens were examined whose walls were already the seat of morbid changes. These cavernous spaces are apparently supplied by thin venous radicles which, commencing in the hyaloid basement membrane, run a comparatively straight course inwards through the lymphoid and connective tissue to open obliquely in the sinus. In some sections the sinuses are distended with blood, whilst in others they are quite empty and tortuous, a condition which has been described as "collapse." This variation doubtless depends upon their condition when removed and the methods of removal. Although their general arrangement does not conform entirely to that of the corp. cavernosa and corp. spongiosum, the slight histological difference does not justify the view that their nature is not erectile, and that they are never erectile in health or disease (as maintained by Bosworth),[2] still less so in the light of the remarkable sympathy which these bodies exhibit with sexual and developmental phenomena.

Your attention is specially directed to these muscular fibres, because in their morbid conditions is to be found an interpretation of the pathology of one form of turbinal disease.

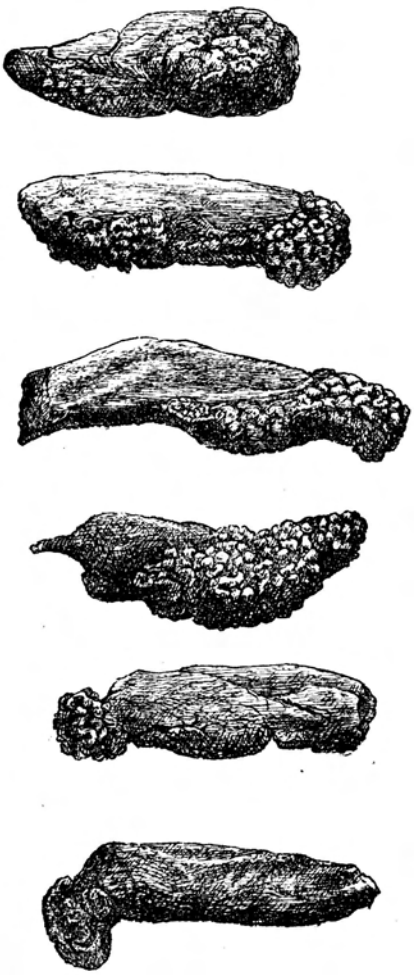
Owing to the courtesy of my colleague, Mr. Carmalt Jones, an abundant supply of material has afforded me an opportunity of tracing the varying degrees of degeneration which this erectile tissue undergoes, and the conditions were so constant in their appearance as to justify the view of a more than merely coincidental connection.

The peculiar villous or brainlike macroscopic appearance of the surface was seen microscopically to correspond with a cystic invagination of the surface epithelium, covering distended loops of vessels with very thin walls, imbedded in mucoid tissue—that is, connective tissue in which the matrix was in excess of the fibrous reticulum and cells.

[1] Greville Macdonald, "Diseases of the Nose," pp. 14 and 16.
[2] Bosworth, "Treatise on Disease of the Nose and Throat," Vol. I.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

The muscular walls of the vascular sinuses presented well-marked atrophy and degeneration, varying from simple thinning to complete disappearance, owing to the fibres apparently sharing the surrounding

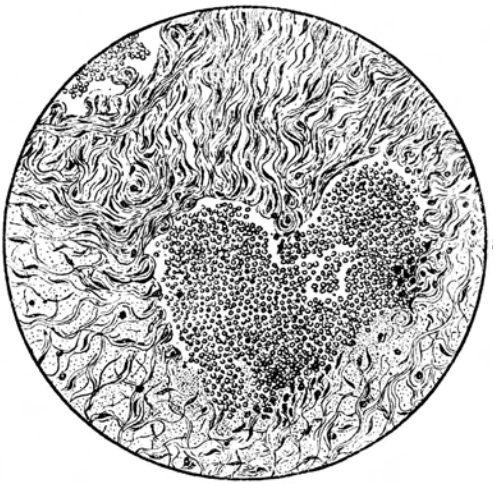


Portions of Turbinals exhibiting different degrees of Varix (*Nat. size*).

mucoid and œdematous changes. In places the intervening mucoid tissue simply formed their boundaries, whilst in other parts the walls seemed to have undergone fibrotic changes. This condition is, therefore, not a mere hypertrophy of the structures, but consists of a true degeneration and infiltration of the walls of these vascular spaces, a morbid process which is responsible for the disease; for the walls gradually losing their power of *active* recoil, the vessels by degrees become more and more distended, and a permanent enlargement ensues, which is in fact a varix.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

Etiology.—The conditions which favour the development of this disease are so gradual and progressive in their influence that it is somewhat difficult to discriminate between the direct or immediate and



Section of the Posterior End of an Inferior Turbinal, exhibiting degeneration of the Muscular Fibres of a Vascular Space (⅛in.)



Section of the Posterior End of an Inferior Turbinal with dilated Vascular Space (*low power*).

the indirect or remote causes. Whilst admitting that a persistent exaggeration of the functions of the turbinal bodies may constitute a predisposing factor, it is difficult to believe—particularly in the light of the histological changes—that simple hypernutrition could be followed by any change other than hypertrophy of the vessel walls. But given a

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

tendency to mucoid degeneration or diathesis, due probably to some tropho-neurotic influences (local or general), excessive erectile activity of the parts must play an important *rôle*. In some instances the presence of an excess of small-cell tissue is strongly suggestive of an inflammatory process preceding the mucoid changes, and from the frequency of this disease among the London east-end aliens it is highly probable that various unhygienic conditions of living, such as prolonged exposure to very dry or very moist atmospheres, more or less charged with impurities particulate and gaseous, must exercise marked predisposing influences, by keeping up constant irritation. That there is an hereditary tendency to hypertrophy of the mucous membranes of the nostrils there can be but little doubt, and this is often associated with a highly emotional temperament. With regard to sex, males appear to be more frequently affected than females, in the proportion of about five to three.

Although considerable enlargement of the turbinals may be seen in early youth, turbinal varix is extremely rare before puberty, but after this period it may appear at any age.

All conditions in which the venous flow is interfered with, such as intemperance with its attendant hepatic troubles, gout, pulmonary and cardiac diseases, with sedentary habits, will naturally be predisposing factors, for in most of the well-marked cases varix was present either in the tongue, legs, anus, or spermatic cord.

The presence of enlarged faucial and pharyngeal tonsils will, doubtless, predispose by favouring nasal catarrh, and by mechanically interfering with the venous flow, but the coincidence of adenoids is by no means frequent, which is not surprising, considering the age.

Excessive use of the nasal douche must not be overlooked, but perhaps by far the most likely exciting or direct cause will be found in the different forms of nasal stenosis, such as morbid states of the septum, collapse of the alæ and general thickenings of the nasal mucous membrane, which not only favour catarrh and the accumulation of its products, but by obstructing nasal breathing cause exhaustion or rarefaction of the air posteriorly and consequent expansion of the venous sinuses, whose muscular walls may be already undergoing œdematous changes.

Thus, nasal obstruction, combined with a predisposition to varix and mucoid œdema, may be considered as mainly responsible for this disease.

Symptoms.—Collectively the symptoms are those of nasal stenosis, such as mouth-breathing and its inevitable sequelæ, parosmia, anosmia and middle-ear troubles, especially distressing tinnitus. But there are several which from their constancy and persistence possess a special significance, viz., a shiny, sanguinolent discharge, generally expectorated in large quantities on waking, and not euphemistically described by patients as "blood and corruption," occasional attacks of severe epistaxis, and either painful tenesmus of the faucial and pharyngeal muscles or paresis of the palate. These constitute a group of phenomena interesting in their striking resemblance to those of piles elsewhere, and are in themselves almost pathognomonic of the disease.

Diagnosis.—Owing to the swollen state of the nasal mucous membrane a view of the posterior half of the inferior turbinal by anterior rhinoscopy

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

is generally difficult, whilst a satisfactory posterior rhinoscopic image is prevented by the frequent faucial tenesmus, but a thorough cleansing followed by the application of cocaine will greatly facilitate an inspection in either direction.

If seen from the front a dull red or purple mass may be found at a varying depth, on one or both sides, which does not shrink much under cocaine, but readily yields to the probe, and does not change its position on forcible respiration—features which will enable an experienced observer to exclude ordinary catarrhal tumefaction and simple polypus. Still it not unfrequently happens that the actual conditions can only be appreciated by a successful posterior rhinoscopy, which will reveal a red or purple brain-like mass projecting into the post-nasal space on one or both sides.

In all instances, however, digital examination will at once afford by far the most reliable and available evidence. A soft resilient yet sharply circumscribed symmetrical mass will be felt on each side of the nasal septum, free all round, except at its attachment to the inferior turbinal bone.

This evidence, together with the existence of varix elsewhere, faucial tenesmus or paresis, blood-stained discharge, and the general history, will sufficiently indicate the nature of the lesion and enable a satisfactory diagnosis to be made from other forms of hypertrophic rhinitis, from polypi, and from other neoplasms, innocent and malignant.

Prognosis.—Should the foregoing description and interpretation of the morbid anatomy be correct, it is obvious that the possibility of a spontaneous cure is most remote, for the tendency will be towards a gradual but certain increase in the size of the varix. The clinical history of these cases amply confirms this view, for although the severity of the symptoms may vary, or even sometimes apparently remain stationary under palliative treatment, the almost inevitable result is that radical measures are demanded sooner or later. But it is quite possible that milder forms may, by judicious treatment, be arrested in the early stage. Should treatment, however, be delayed for several years, the enlargement assumes such proportions that on surgical attention becoming urgent by reason of the profuse bleeding and the stenosis, a diagnosis of angio-myxoma, papilloma, or some other form of nasal growth is often made.[3] General thrombosis of the mass is a somewhat rare termination.

Treatment.—The treatment will be palliative and radical. Palliative remedies, such as alkaline and astringent douches with general depletion, can only afford temporary relief, and must only be considered as preliminaries to a more thorough and permanent treatment.

The radical measures will be directed first towards the removal of obstructions in the anterior regions of the nostrils, afterwards to the treatment of the varix itself. Should any mucous polypi be present they must be removed, and any localized hypertrophy of the anterior end of

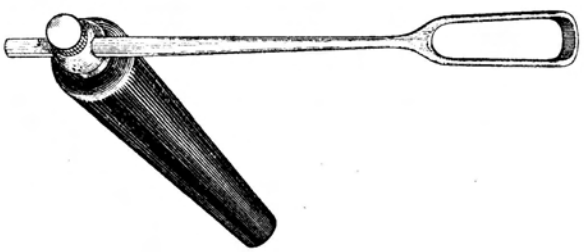
[3] Sandford, "Transactions of the British Laryngological and Rhinological Association," vol. iii., p. 13; Luc, "Archives de Laryngologie," Dec., 1890; Spencer Watson, "Journal of Laryngology," July, 1893, p. 329. Coincidence of Lingual with general Varix, Paretic Velum and Tenesmus.—*Vide* "The Throat and Nose": Lennox Browne, London. Baillière, Tindall & Cox, 1893, p. 573.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

the turbinal bodies or septum should be reduced by galvano-cautery, chromic acid, or snare. Activity of collapsed alæ may be restored by massage and wearing short pieces of rubber tubing, or the nasal rings made by Hawkesley. The portal system should be depleted by a mild course of mercury and chalk, or saline aperients.

Direct treatment will be determined by the size and duration of the varix, and its response to the action of cocaine, for should it be small, and of probably only a few years' duration, it may more readily contract. This degree of hypertrophy will most likely yield to the galvano-cautery, which should be applied either by plunging a fine point well into the substance of the cavernous tissue, or by deeply scoring it with the fine edge of a flat point. Fused chromic acid, if applied *secundum artem*, is often very satisfactory. A slough generally separates about the fifth day, and cicatricial fibrosis, with strangulation of the enlarged vascular spaces, soon follows. Both nostrils should on no account be cauterized at the same sitting. When the swelling, however, is very large, and does not shrink under cocaine, caustics are absolutely useless, and complete removal is necessary. This may be effected either by means of a snare or a cutting instrument. Of the former the cold snare or écraseur is preferable to the galvanic, for it will, if necessary, cut through a portion of the bone, and if gradually tightened will not be followed by much hæmorrhage, nor will it cause any subsequent sloughing, as is often the case with the galvanic loop.

If only soft tissues are to be removed Krause's snare succeeds admirably, but either Jarvis' or Wilkin's is preferable when it is decided to include the bone. As a rule, there is no difficulty in engaging the swelling if the wire is directed by a finger in the post-nasal space. But by far the most satisfactory results, as far as complete enucleation is concerned, are to be obtained by the ring or draw-knife as introduced by



Carmalt Jones' Improved Ring Knife.

Spencer Watson in 1881, and greatly improved by Carmalt Jones. It has the great advantages of being effective, rapid, safe, and painless, only ordinary dexterity being demanded by the operator.

The operation is conducted as follows :—The patient is seated on a chair in the usual position for nasal inspection, the head being steadied by an assistant. After freely cleansing the nostrils with an antiseptic

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

douche and applying cocaine (a mouth prop being introduced at discretion), the knife is introduced into the nostril, with its cutting side directed towards the diseased turbinal; the guarded index finger of the disengaged hand is passed by the mouth into the post-nasal space, and directs the ring into its proper position around the varix. The shaft is then directed slightly towards the opposite side of the face and sharply but firmly withdrawn in that direction, cutting its way through the turbinal body, which either escapes at the same moment or is subsequently removed by forceps should it not be dislodged by patient blowing down the nostrils.

By keeping the axis of the instrument across the median line and by varying the angle, it is possible to remove only the particular part which is diseased, so that the anterior and healthy portion is left intact, and the possibility of laying open the maxillary sinus is reduced to a minimum. The opposite side is then treated in the same way. Bleeding is generally profuse for a few minutes, but is easily controlled by dry tannin and lint plugs. These should be followed by plugs of boric lint firmly packed and left in for twelve or twenty-four hours, absolute rest in the semi-recumbent position being insisted upon. The plugs are removed at discretion on the second day, when the nostrils should be gently cleansed with Dobell's solution.

Owing to the rapidity and almost painlessness of the operation, the major anæsthetics are neither necessary nor are they expedient, cocaine proving quite sufficient; still, in the case of very nervous patients, gas may be exhibited with advantage, for the operation is easily completed during its influence.

The use of the ring knife has one advantage in particular over the snare, in that it removes all the diseased tissue at once; for it often happens that the varix extends for some distance along the inferior border of the turbinal, and is very difficult to include in the snare.

Complications.—Two important complications are to be guarded against, viz., septic changes and secondary hæmorrhage. The first of these need not be feared if ordinary antiseptic precautions are taken, especially with regard to local cleansing before and after the operation, for, beyond a slight elevation of temperature, in upwards of 200 cases of turbinotomy, at the Central London Throat and Ear Hospital, there is no record of any trouble of this kind, which is somewhat remarkable, considering the dirty domestic surroundings of many of the out-patients.

With regard to secondary hæmorrhage, this may occur as late as fourteen days after operating, and as it is generally occasioned by the patient's disregard of the instructions as to absolute rest and removal of the dressings, whenever practicable he should remain in bed for three or four days, and under observation for at least a fortnight. Although sometimes the bleeding is alarming, ordinary measures are quite sufficient to stop the flow.

Results.—The swollen anterior end of the inferior turbinal soon shrinks, and free breathing is quickly established, with a corresponding amelioration of the symptoms. But are the results always so satisfactory.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press

Certain undesirable sequelæ have been advanced as likely to follow turbinotomy, viz. :—

1. Increase in size of the nasal cavities, anosmia, general atrophy of the mucous membranes of the nose, naso-pharynx and larynx, with the usual troubles attendant upon imperfect filtration of the atmosphere.

2. Opening up of the maxillary sinus, and subsequent suppuration.

3. Falling in of the nostrils and deformity.

Having personally investigated the subsequent history of over 200 cases, some of which were operated upon as far back as three years, none of these evils were found to have occurred. That atrophy of the mucous membranes may follow it would be unreasonable to deny, but it is only reasonable to assume that it occurred in patients who were subject to atrophic rhinitis, which was not recognized in its early stage, and for which milder measures would have sufficed. Permanent deformity due to collapse of the nostrils I firmly believe to be a phantom, for it not unfrequently happens that, instead of an unnaturally roomy nostril, a distinct reproduction of the mucous membrane follows, in the form of a ridge extending backwards from the anterior vestige of the turbinal crest which remained, and presented the appearance of a normal inferior turbinal. This was so remarkably shown in a case treated by Mr. Carmalt Jones that he removed a portion of the new turbinal two years after turbinotomy, for microscopic examination. I found that it consisted of normal mucous membrane complete in its details. In two instances this turbinal spur was sufficiently prominent to require reduction by cautery.

It is quite possible that the hiatus maxillaris may be enlarged, but that does not necessarily entail any serious results—at all events, I am not aware of its having occurred in the practice of my own hospital. It is easily avoided by confining the portion removed to the region which is diseased—a restriction which is not sufficiently observed.

In conclusion, it is not surprising that there should be some diversity of opinion regarding the pathology of a structure whose normal histology is the subject of so much dispute. It was, therefore, with the hope of obtaining some further histological evidence, both normal and morbid that I availed myself of the plentiful supply of material at my disposal. This investigation has, I venture to advance, established not only that visceral muscle fibres do exist in the walls of the venous sinuses, but that their morbid changes are responsible for the form of vascular hypertrophy which I have ventured to call Turbinal Varix.

https://doi.org/10.1017/S1755146300155672 Published online by Cambridge University Press