THE
JOURNAL OF LARYNGOLOGY
AND RHINOLOGY.

VOL. IV.

DECEMBER, 1890.

No. 12.

The Editors do not hold themselves responsible for opinions expressed by contributors.

ON DEVIATIONS AND SPURS OF THE
NASAL SEPTUM.¹

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DEVIATIONS and spurs of the septum of the nasal fossæ, although described long ago by most anatomists, have really only had the attention of clinicians drawn to them during the last few years, from the time when the pathology of the nasal cavities assumed the importance due to it. We can therefore assert, without fear of contradiction, that the question which occupies us to-day is one of those which we owe to rhinologists, who alone have demonstrated the clinical importance of these alterations of the skeleton. If you have done me the honour to nominate me to open a discussion upon a question so full of interest, I do not think that the intention is that I should describe to you the different forms of deviations of the nasal septum, and the various spurs and excrescences which are met with every day, and with which specialists are perfectly familiar. It will suffice for me to recall to you that these lesions have been the subject of numerous works in France (Loewenberg, Duplay, E. J. Moure, Miot) and abroad (Zuckerkindl, Michel, Bresgen, Fraenkel, Moldenhauer, Jurasz, Schech, Welcker, Bosworth, Bryson Delavan, Jarvis, Morell Mackenzie, etc.), so as to dispense with my entering beforehand into the anatomical dispositions of these various pathological conditions. I shall not discuss the origin of these lesions, as to whether they are congenital, whether they occur at a certain age (six or seven), or whether they are the result of an error of nutrition, or a traumatism which often passes unnoticed. It is incontestable that excrescences from the anterior portion of the nasal fossæ often have their origin in a fall upon the nose, or a blow upon this organ. It is recognised with what facility children fall upon this prominence, and we cannot forget that they also often receive blows from the fists of ill-humoured or mischievous companions. It would not be extravagant to claim that the traumatisms of

¹ Read by M. Moure, at the International Congress of Berlin, 1890.

infancy could have their share in the pathogeny of these productions or malformations. However, I shall not dwell upon this part of the subject, having especially the aim in this communication of (a) the operative indications for these cartilaginous or osseous outgrowths, and (b) the manner of performing the operation.

(a) *Operative Indications.*—As it is conclusively proved that the septum of the nose is never strictly perpendicular, and that from birth (Duplay) or from the age of seven (Zuckerkindl) the septum inclines to one side or the other, it will be well to guard against considering as pathological every malformation, even slight, of the septum, and from wishing to redress a curvature often quite normal. This is an anatomical condition against which we have not to struggle, since it does no harm to the subject in whom it occurs. It is only when the deviation or projection is really pathological that we are authorized to interfere by one of the means which we indicate further on. Such are, for example :

1. *Stenosis of one or both Nasal Fossæ*, impeding respiration from being properly performed by these cavities, and putting the entire organism under conditions of defective vitality. I have no need here to remind you of the rôle of the nose in the physiological act of respiration ; we all know too well its importance to underrate the troubles which result from obstruction of these air channels, and consequently the formal indication for limiting this state of things within the limits of possibility.

Nasal stenoses, whether congenital or acquired, have, moreover, the inconvenience of very often causing mischievous effect upon the organ of hearing, either by causing a nasal catarrh of which the propagation to the Eustachian tube or middle ear is very fatal to this organ, or in causing complications of tubal affections or pre-existent affections of the tympanum.

Not only does impeded nasal respiration constitute a bad condition as regards the hearing of the patient, but malformation of the cavities very often makes treatment (catheterism) difficult, impossible, or even ineffective. I well know that it is rare to find both fossæ equally obstructed, and that one is generally narrowed and the other enlarged.

The catheter may thus be introduced through the side opposite to that obstructed, and insufflation is still possible, but it is none the less true that benefit obtained in these conditions is of short duration so long as the stenosis has not been modified by energetic treatment. We cannot hesitate to make certain nasal affections (Eustachian catarrhs, middle ear catarrhs, sub-acute or chronic, moist or dry) enter into the indications for operation upon deviations or spurs of the nasal septum, but only when they are sufficient to constitute a possible cause of the lesion, and are hindering cure or favouring recurrences.

Chronic catarrhs of the pituitary membrane, with affections of the nasopharynx or pharynx consecutive to stenosis of the nasal fossæ, enter also into the category of stenotic indications which I have just mentioned.

2. *Reflex Neuroses.* When the outgrowths, spines or asymmetries of the septum, without being large enough to impede nasal respiration, become the point of departure for those nervous affections so various and so well known to-day, thanks to the works of Voltolini, B. Fraenkel,

Koch, Hartmann, Sommerbrodt, Joal, Duplay, Cartaz, Ruault, E. J. Moure, J. Mackenzie, etc.—to mention only some—when these septal spurs are evidently the cause of these reflex neuroses (migraines, neuralgias, glottic spasms, spasmodic cough, etc.), it is necessary to remove the spine which causes so much trouble, or at least which acts as a determining cause.

3. A last indication is *æsthetic*. When the malformation is the result of a traumatism (blow or fall upon the nose) which has occasioned either a fracture of the septum and the formation of a vicious callus, or an enchondroma or exostosis consecutive to a perichondritis or periostitis; when a depression of the nasal skeleton, or a considerable deformity of this organ results, we may then, in certain cases and subjects, interfere surgically if we may hope to remedy this condition of things, and to obtain for the patient a sufficiently proper nose. I hasten to add that these extremes are pretty rare. We shall see a little further on what treatment is called for in such cases.

Such is the *résumé*, briefly, of the different cases in which we ought to interfere, and we shall now study the *modus faciendi*, which constitutes the second part of this study.

(b) *Treatment of Deviations or Crests*.—When the deviation is simple and relatively easy to correct, the finger may be employed as recommended by Michel, or the different prothetic apparatus of MM. Jurasz of Heidelberg, or Delstanche of Brussels. These apparatus, the form of which should always be adapted to each case, can only be really efficacious in adolescents and in the case of simple incurvation and recent luxations of the fibro-cartilage. The existence of spurs or sharp crests constitutes almost a contra-indication to these replacements, which are often difficult and always take long to obtain.

The most simple and rapid method of arriving at the result desired is still surgical treatment, which varies with each patient and with the end in view. If it is desired merely to render respiration through the nose more easy, we may, as recommended by Blandin, make a communication between the two nasal cavities, by removing a piece of cartilage with the punch. This is comparatively a simple proceeding, but rather painful, and only half solving the problem, or rather putting it on one side without attempting to solve it. Chassaignac, bolder, dissected the pituitary membrane and removed the deviated portion by resection; this is, indeed, the proceeding generally used at this time, the instruments for which merely have varied. In place of using a gouge which many specialists have nearly abandoned, either the saw is used *ad hoc*, or the cutting forceps. This is evidently a rapid process but a sanguinary one, for the flow of blood is always pretty abundant. Hæmorrhage, however easy to control, is a serious obstacle to operation, because it frightens the patient if he is conscious, or impedes chloroformization if he is asleep, and because it also hides the field of operation and does not permit the surgeon to operate at his ease.

Moreover, the subsequent treatment is prolonged, sometimes even painful, if we wish to avoid adhesions which sometimes tend to be produced between the resected portion and the mucous membrane

covering the inferior turbinated body. *En résumé*, resection of the septum as thus practised is an operation at which the patient may well hesitate, in spite of cocainization and anæsthesia, and except in cases where the outgrowth is very exuberant or very sharp, and of small calibre, and consequently easy to rapidly resect, I consider that there is much labour and sometimes evil consequences in obtaining a quite minimal result. And in spite of all the success attributed to this nearly universally employed method, I cannot share the enthusiasm of my *confrères*, and particularly of my American colleagues. In spite of all the perfections introduced by them into the apparatus, in the rapidity of operation, and security offered to the patient, I still consider the cutting method as defective and too alarming for the great generality of patients. To find a method without pain, and especially without hæmorrhage, is a considerable progress, and one which will always decide them to get rid of the deformities or outgrowths with which they have often existed for more or less prolonged periods of time. This process, introduced in France and used by Dr. C. Miot, has been simultaneously used by Dr. Garel, of Lyons, and myself. The results obtained have been so encouraging that I do not hesitate to give preference to the method in the treatment of deviations (with or without thickening) and of osseous or cartilaginous outgrowths of the nasal septum. This method is *electrolysis*. With it we can operate as energetically or as lightly as is desired, and, thanks to cocaine, it is made almost painless; and a point of capital importance, the septum is destroyed without any flow of blood, or at least with scarcely a few drops which stain the handkerchief when the electrolysis is ended. For more than two years I have employed this method; I have resected a great number of abnormal septa, and the result has in all cases been that which I sought.

In severe cases with voluminous deviations and exostoses, and at the commencement before the *modus faciendi*, the intensity of the current employed, and its duration had been established properly, many sittings were necessary; but the patient always submitted at the second or third sitting more willingly than at the first, knowing very well that the operation was without pain. I will not fatigue you with the enumeration of cases all showing a more or less complete analogy; I will only describe to you the electrical *technique* of the operation.

This part of my subject has been treated of by M. le Dr. Bergonié, Professor of Physics at the Faculty of Bordeaux, and in charge of the electro-therapeutic department of the Hôpital Saint André, with whom I have practised all the resections made by this method, and whom I now leave to speak.

"The electrolytic method which Dr. Moure and I have employed for "destruction of septal deviations, is based on the following electrical data.

"We have sometimes employed monopolar positive galvano-puncture, "sometimes bipolar galvano-puncture.

"The operative *technique* for the employment of monopolar positive "galvano-puncture is as follows: A large indifferent electrode 200 centi- "mètres (10 by 20) square, was applied to the patient between the two

"scapulæ, and connected with the negative pole of the battery. This
"indifferent electrode, which I have recently constructed, is formed of a
"copper plate covered by 'flattening' on the two surfaces with a thin sheet
"of platinum, which is unoxidizable and not attacked by electrolytic
"action. This plate, protected at its edges by an isolating rim of caout-
"chouc, is stuffed with several layers of hydrophilous gauze, forming a
"layer of nearly a centimètre in thickness, and kept in place by an external
"envelope of fine linen. The advantages of this indifferent electrode are
"the following : it remains almost indefinitely without discoloration by
"metallic electrolysed salts, it imbibes and retains the water of imbibition
"with the greatest facility, and lastly, its electrical resistance is constant,
"a factor which is not obtained by the ordinary indifferent copper or
"nickel electrodes, which are quickly covered on their surface exposed to
"the action of the current with a layer of oxide which is more or less
"isolating.

"This indifferent electrode being put in place, and the patient
"cocainized, a steel needle is inserted well into the centre of the deviation
"to be destroyed. We have constantly employed steel needles because
"their penetration, even in the hardest septa, is obtained without too much
"difficulty. It is not so with needles made of the precious metals, such as
"gold or platinum. Their points are quickly blunted in most cases, and
"penetration is difficult. These steel needles may have a diameter of 0.8
"to 1.5 millimètres, and the diameter of the needle may be proportioned
"to the volume of tissue to be destroyed by electrolysis. The largest
"needles often yield the best results. Their length is from 8 to 11
"centimètres. These needles are easily obtained in commerce, where
"they are sold for sailmakers. The needle is isolated in all its free
"portion by a thin caoutchouc tube. The positive pole of the battery is
"connected with the needle. An electro-motive force of thirty volts of the
"battery utilized is quite sufficient for all cases. The circuit is formed
"(1) by a battery of thirty volts; (2) by a continuous rheostat (the one we
"have employed is a liquid rheostat of special model, and giving a resis-
"tance of from a demi-migohm to several ohms, passing through all
"intermediate strengths); (3) by a milliampèrimètre exactly standardized
"(the one we have employed was constructed under my directions in
"1885—it is a Deprez-d'Arsonval with a vertical needle, twenty-three
"centimètres long, moving on a dial of the same radius, graduated in demi
"and milliampères, allowing the ready perception of a quarter of a
"milliampère); (4) the patient. In commencing the operation the rheostat
"is put at its maximum of resistance, and the circuit closed. The current
"intensity is then some hundreds of a milliampère; the resistance of the
"rheostat is then very slowly and progressively diminished, until the
"intensity of the current is at its desired figure. The duration of this
"period of increasing the intensity should be not less than two minutes,
"if all painful impressions are to be avoided to the patient. During this
"period the intensity rises a little. It is then brought back to zero with
"the same precautions and slowness. The sensation of constriction and
"tearing, which the patient feels whilst the current is passing, ceases
"almost suddenly with a slight diminution of the current intensity so

“ much that there is, so to speak, no relation between the feeble amount
 “ of variation in the current which is made, and the clear sensation of
 “ relief and expansion which the patient feels.

“ The destructive effect produced by the electrolysis is proportional, as
 “ we should expect, to the quantity of electricity which has traversed the
 “ electrolysed tissue. This law is, however, true only when the intensity
 “ has not passed below 10 millampères. For intensities between 12 to 30
 “ millampères, intensities which we have used in the numerous cases we
 “ have treated, this law appears to be always true. It is known that if
 “ the quantity of electricity, which may be called Q , has traversed a
 “ circuit in which has circulated a current of intensity I , during a period
 “ T , then $Q = I T$. The quantity of electricity may therefore be varied,
 “ and also the effect produced by it, by making a variation of either
 “ factor, or even of both at the same time. The intensities employed by
 “ us have varied from 12 to 30 millampères, as I have said previously. The
 “ period of passage of the current has varied from ten to twenty minutes.
 “ So that if a calculation is made of the amount of electricity capable of
 “ destroying a deviation of the septum of medium size by the monopolar
 “ positive galvano-puncture method, this amount is found to oscillate
 “ about the figure of 18 colombs. This is only an average figure, which
 “ particular clinical conditions may cause to vary more or less. Thus, in
 “ a very dense tissue, in which the needle penetrates with difficulty, 20, or
 “ even 22 colombs would be required to produce a limited destruction,
 “ whilst the same amount traversing soft friable tissue would produce a
 “ destruction much more extensive, or even a perforation of the septum.

“ The question of density of the current has not arisen, since, the
 “ surface of the needle employed being always very small, the density of
 “ the current at that spot is always very great.

“ When the needle is withdrawn it is seen to be strongly oxidized.
 “ The same needle cannot be used a second time.

“ The second method which we have employed is bipolar galvano-
 “ puncture. In this case the operative *technique* is as follows :—There
 “ is no longer any indifferent electrode ; after cocainization two steel
 “ needles are introduced into the deviation, sufficiently apart that they
 “ cannot touch in their course. The needle placed in the thickest or
 “ hardest part of the deviation is connected to the positive pole, the other
 “ to the negative pole. These two needles are isolated throughout their
 “ free portion by a thin caoutchouc tube. This isolation ought to be
 “ performed with care in order to avoid all contact between the two
 “ needles, which would short circuit the patient. An electro-motive force
 “ of 20 volts, the limit of the battery which ought to be employed, is more
 “ than sufficient by reason of the small resistance offered by the tissue
 “ which is to be electrolysed between the two needles. The circuit is the
 “ same as in the previous case, and the mode of introducing the current
 “ is just the same. The quantity of electricity is not the same by the
 “ bipolar method as by the monopolar method to produce a given
 “ destructive effect. It is a little less by the bipolar method. This is
 “ intelligible, for if the electrolytic effect at the level of the negative
 “ needle is much less pronounced, as is the rule, than round the positive

“pole, this effect is not *nil*; it is added to the effects produced by the positive needle.

“The intensities which have seemed to us convenient for all these cases range from 12 to 25 millampères—the duration from ten to twenty minutes; the average quantity of electricity employed in an average case by the bipolar method being about 16 colombs. There is sometimes produced slight hæmorrhage on withdrawing the negative needle. It is to endeavour to prevent this hæmorrhage that we try to cause inversion of the current to intensity zero. We have succeeded only rarely after having made this inversion in causing the current intensity to pass to millampères. This is due to an electrolytic polarization of the tissues, which enormously increases the *apparent* resistance. This inversion is not indispensable; its only aim is to check the slight hæmorrhage produced by the puncture of the negative needle. This needle, if inversion has not been performed, is not attacked, and may be used again.

“Which is the best of these two methods?

“From the electrical point of view they present no sensible difference apart from the small relative difference in the quantity of the electricity, but it is not the same from the clinical point of view. The painful phenomena provoked by the derivations of the current in the sensitive nerves are much more marked in the monopolar than in the bipolar method. It must necessarily be so, for the intensity of the derived currents in the bipolar method can only be excessively feeble by reason of the proximity of the two needles acting as electrodes, and the feeble resistance interposed. The bipolar method ought, therefore always to be chosen when the needle can easily be introduced into the deviation to be destroyed. There are cases where this is not possible; in these, monopolar galvano-puncture will answer all indications.”

I repeat that this is a very simple method of procedure for both patient and physician; it is a proceeding absolutely certain, after the few inevitable failures of all new trials, and the result is absolutely as solid and definite as in sanguinary resections. Can electrolysis suffice for all cases? Evidently not, and it cannot be employed when the rectification of the nose is made from an anæsthetic point of view; in this case surgery will be indicated, and it is necessary to open the nose by the method of Demarquay, Richet, or d'Ollier (of Lyons), a method already employed in America. A large operative surface will then be necessary, for it is necessary to fracture to make a veritable osteotomy of the septum, often even of the nasal bones, so as to then apply an apparatus appropriate to each case. These cases are evidently out of the ordinary run of our operations, for which electrolysis well conducted amply suffices, for it always gives the desired result—that is to say, disappearance of the cartilaginous or osseous excrescences of the nasal septum.