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ON THE SURGICAL TREATMENT OF NASO-PHARYNGEAL POLYPI.

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It has long been known that a class of fibrous growths, sometimes recurrent and sarcomatous, had for their *habitat* the top of the pharynx and the posterior nares. These are quite different from the ordinary mucous polypi of the nasal passages, and are much more formidable.

Two varieties exist. The one, and more common, grows from the body of the occipito-sphenoid bone, or roof of the pharynx; starting from the periosteum, filling the pharynx, obstructing the posterior nares, hanging down below the soft palate, and interfering with deglutition, and, in extreme cases, with respiration. The other, less frequent, originates in the sphenomaxillary fossa, and thence pushes out into the zygomatic fossa, forwards towards the nose, and upwards into the sphenomaxillary fissure. Neither of these forms infiltrates neighboring tissues like cancer, and rarely contracts adhesions. They advance by pressure and absorption, and destroy neighboring parts by their growth. They recur, unless the attachment of their root to the periosteum is wholly destroyed, but not otherwise.

Either of these forms may, however, on recurrence after insufficient removal, become softer, less fibrous, more cellular and more malignant.

In the worst cases, the naso-pharyngeal polypus may push out its processes into every adjacent cavity, as the nares, the antrum, the ethmoidal and sphenoidal cells, or the sphenoidal fissure, inside the cranium.

The various operations resorted to for the removal of these foreign growths have been recently reviewed by Dr. H. B. Sands, of New York, whose paper on this subject will form the basis of this communication.* While excellent as a *résumé*, and interesting for the case there described, the article by Dr. Sands has one important omission, and is also, as it seems to us, open to criticism in the surgical deductions which he draws as to the advantages of his method of operating. After mentioning the varieties, symptoms and clinical history of naso-pharyngeal polypi, and showing how important it is to diagnosticate the exact site of the pedicle or root of the tumor, Dr. Sands remarks

* On Naso-pharyngeal Polypi. By H. B. Sands, M.D., Professor of Anatomy in the College of Physicians and Surgeons, Surgeon to the Bellevue and Roosevelt Hospitals. Re-printed from Dr. Brown-Séquard's Archives of Scientific and Practical Medicine. New York. 1874.

that, on the dead subject, the pharynx can be explored through the mouth, and that the finger will reach quite to the summit of the pharynx. He claims, also, that, on the living subject, the pedicle of the tumor can be distinctly traced up to its attachment to the occipito-sphenoid bone, with the finger in the fauces pushed up behind the soft palate.

Most persons find it impossible to reach higher than the orifice of the posterior nares, when the pharynx is empty; the difficulties of exploration are much increased by the presence of a tumor; and the surgeon must have a very long forefinger—the patient, too, being exceptionally tolerant of manipulation—to enable him to touch the occipito-sphenoid bone.

The treatment pursued by surgeons is one of the following operations:—

1. Avulsion.
2. Ligature.
3. Galvano-cautery.
4. Caustics.
5. Electrolysis.
6. Excision.

(1.) “Cases suitable for avulsion are rare; and, in most instances, the attempt to extract the polypus by the forceps fails.” Neither is this mode of operation free from danger. Dupuytren once tried to extract a polypus through the mouth with the forceps. He only partially removed it, and there was a copious hemorrhage. The following morning, the patient was found dead in his bed.

Mr. Cooper Forster recently attempted the same operation. Profuse bleeding occurred at the time; subsequently, headache, aphasia and convulsions. The patient died on the twelfth day. On *post-mortem* examination, the cribriform plate of the ethmoid was found broken, probably by the avulsion of the polypus. This operation, then, so successful with the simple nasal polypus, should be restricted to that form.

Guérin, we are told, used a still more rude, and probably dangerous plan, namely, to pass the left forefinger up to the pedicle of the tumor, by the mouth, and then with the right hand, manipulating by the nose, the tumor was torn from its attachment by a raspatory.

(2.) The ligature has been successfully used, and was the classical mode with the old writers; but this is not sure nor free from danger. The pedicle of the tumor, if small, is surrounded by a loop of silk, or hemp, and both ends brought out of the nostril. A double silver canula (Gooch's canula, much used by the old surgeons for polypus of the uterus) is then made to glide over the threads, through the nose, and, when in contact with the pedicle, the ligature ends are drawn tight and secured. Ulceration of the pedicle takes place, and the tumor sloughs off and is withdrawn through the mouth. Although a portion of the pedicle is left behind, yet, as in uterine polypus, it may shrink away, and not grow again. It is, however, apt to return, and the use of the ligature occasionally causes death—one case (Gunter's) of death by suffocation, from the falling of the tumor into the larynx. Other cases have terminated by œdema of the glottis, and others by pyæmia. Winter, Dr. Sands tells us, operated by ligature, but on the fifth day the putrid odor of the tumor was insufferable. On

the seventh day, respiration and deglutition were so greatly embarrassed that the surgeon was obliged to seize the growth and tear it away.

(3.) The galvano-caustic ligature is very useful sometimes, especially in completing the work begun by the knife. "It has the great advantage over the ordinary ligature of causing the separation of the growth, at the time of the operation." So, too, have the *écraseur* and the chain-saw, both of which have been successfully employed. These latter methods, used alone, leave the growth behind; and they cannot be used at all, except where the pedicle is small, or well defined and accessible.

(4.) The use of caustics is condemned by Dr. Sands. The deep situation of the tumor, and the danger of caustic action extending on to the pharynx, and even into the larynx, is reason enough for their disuse; besides which they are not radical.

(5.) Electrolysis, like the galvano-caustic ligature, or other caustics, is useful as an auxiliary to more direct surgical means, rather than by itself. "Electrolysis is tedious, laborious and uncertain." In one case, reported as successful, no less than one hundred and thirty sittings were required to destroy the growth. A large fibrous polypus cannot be destroyed by this agent. The galvano-cautery is much speedier and surer. "I am satisfied," says Dr. Sands, "that neither in the removal of large naso-pharyngeal polypi, nor of any large tumor, except, perhaps, one composed of erectile tissue, can electrolysis be accepted as a substitute for the knife."

(6.) Excision. The tumor may be reached through the mouth, or by the resection of some of the bones of the face. The excised bones may be taken away altogether, or they may be replaced, after the extirpation of the tumor. We designate the first as an excision of the upper jaw, or portions of it; the second, as a *displacement* of the upper jaw, or an osteo-plastic operation.

Operations through the mouth are as old as Hippocrates, but were chiefly revived and advocated by Nélaton. The polypus is exposed by slitting open the soft palate and uvula in the median line, and, after removing the foreign growth, by closing the wound in the palate by sutures. In some cases of large polypus, additional room to manipulate has been gained by excising a portion of the hard palate. When we consider the distance of the occipito-sphenoid bone from the orifice of the mouth, the darkness, and obscurity by hæmorrhage, and also the fact that cutting away the hard palate unveils the nares, rather than the pharynx, we shall conclude that this is not the most direct and simple way to reach a naso-pharyngeal polypus.

Total excision of the upper jaw was practised successfully in 1840, by Flaubert, and, it is claimed, by Syme, in 1832. "It has been repeatedly done, and is praised by Michaux, Robert and others." It is undoubtedly the most direct and perfect way to explore the naso-pharyngeal cavity, and hence to extirpate foreign growths. But it entails a great mutilation; the orbit, nose and mouth are practically thrown into one cavity, and it is adapted only to tumors of the antrum, or sphenomaxillary fossa, which are malignant and infiltrate neighboring tissues, as cancer does.

Partial excision of the upper jaw, for the removal of a naso-pharyngeal polypus, was first practised by Maisonneuve in 1860. The upper lip is slit up into the nostril, and the flap of the cheek retracted.

The upper jaw-bone is then denuded of flesh; the mucous membrane of the hard palate is divided in the median line, and the soft palate cut away from the hard palate, for one half of its extent. An incisor is drawn, strong bone forceps are introduced into the nose and mouth, and the alveolar process and hard palate divided. One blade of the forceps being still in the nose, the other is applied horizontally to the external surface of the upper jaw, beneath the malar tuberosity, and the walls of the antrum are divided. This separated, half of the upper jaw is then torn away. It contains the alveolar process and teeth of one side, the palate process, the lower two-thirds of the antrum, and part of the pterygoid process. The polypus is then removed, and the soft parts sewed up.

"Five osteo-plastic methods deserve description, namely: two devised by Langenbeck, one by Huguier, one by Roux, and one by Dr. Cheever, of Boston."

Langenbeck's simpler and milder operation consisted in cutting open and turning upwards on to the forehead the nasal bone and nasal process of the superior maxillary bone, so as to expose the nasal cavities of one side. After removing the polypus, the bones are restored to place, and unite again. We find, on research, other modes as follows: Chassaignac proposed an operation to cut up the entire nose from the left cheek, and turn it over, bones and septum included, on to the right cheek. He admits, however, that deformity follows this operation. Boeckel carried out the same method, but preserved and restored the nasal bones. Verneuil has published a method of opening the nose from the side, by lifting the alar cartilage and nasal bone, toward the septum. Lawrence (1862) operated by cutting the septum and both alæ from below, and drawing the nose upwards and backwards, so as to expose the middle and lower meatus.

Dr. Sands has overlooked, or omitted, in this connection, the osteo-plastic operation of M. Ollier, of Lyons. This is by far the best operation done by displacement of the nose.

M. Ollier* calls this "a new operation for the removal of naso-pharyngeal polypi," and first published it in 1864.

He describes it as "*osteotomie verticale et bilatérale des os du nez.*" It is very simple, and consists of four steps, as follows:—(a.) A horse-shoe incision, down to the bone, starts from the level of the right ala of the nose, ascends obliquely to the highest point of the naso-frontal junction, just below the eyebrows, in the middle line, and descends obliquely to the left ala. A narrow saw, placed flat against the orbital ridges, now divides the bones, down through this incision, to the alar cartilages. The septum and alæ are snipped, to a slight degree, with scissors, and the nose is turned upside down, and hangs by the alæ and septum near the lip.

(b.) The nasal passages are now opened, but it is found that the septum is in the way; this is broken and forced aside by pushing in the finger, without rupturing the mucous membrane. In this way, ample room is given to see and reach back into the naso-pharyngeal region.

(c.) The occipito-sphenoid bone and the attachment of the foreign growth are now easily reached by the finger; it is torn away with strong forceps, or severed with curved scissors, and, lastly, all the

* *Traité Experimentale et Clinique de la Régénération des Os, et de la Production artificielle du Tissu osseux.* Par L. Ollier, Chirurgien en chef de l'Hôtel-Dieu de Lyon. Paris. Victor Masson et Fils. 1867. Tome second, pp. 482, et seq.

pedicle and periosteum to which it is attached are rasped away from the bone, and the chance of recurrence prevented.

(*d.*) The nose is restored to place. It fits perfectly at the sawed portions, and hence it unites without deformity. The vascular supply from the branches of the facial artery (the superior coronary, lateral nasi and angular arteries) running from below upwards, ensures ample nutrition to the flaps.

The nose, says M. Ollier, does not lose its warmth, and becomes only slightly livid. In no case was there a failure to unite. In one case the patient imprudently blew his nose with his handkerchief the fourth day after operation, but no harm resulted. The skin unites by first intention. The bones stiffen in two weeks. Ossification of the callus (provisional) occurs in about six weeks. One of the chief difficulties of the operation, he continues, is to detach the polypus, so solidly is the fibrous tissue implanted in the periosteum. The anterior opening through the nasal orifice gives the best and safest direction in which to make traction for its removal. "We have no confidence, as regards recurrence, save in removal followed by the rasp, until we can feel the osseous tissue of the basilar process quite denuded." As regards the room for manipulation by Ollier's operation, he has removed, in this way, a naso-pharyngeal polypus, weighing 205 grammes—"perhaps the largest fibroma which has been taken away from this region."*

Having performed Ollier's operation upon the living subject, we can bear personal testimony to the ease, safety and excellence of this operation. And unless in growths so exceptionally extensive as to invade the sphenomaxillary fossa or antrum, when Langenbeck's second method would be indicated, we should prefer it to any form of displacement of the jaw.†

There are, however, other and milder ways of reaching the antrum, without subsequent deformity.

Ollier proposes to accomplish this by deepening his section of the nose, and carrying the section obliquely backwards, and thence forwards, to the soft parts.

Roser, of Marburg, in his Surgical Anatomy,‡ gives a section to display the antrum and nasal fossæ, which we have practised in demonstrations on the dead body, and which seems well adapted to uncover growths lying in the antrum, nasal passages, &c. Starting from the centre of the nasal depression below the eyebrows, like Ollier's, this section goes obliquely backwards through the upper jaw, antrum, alveolus and palate, to a point between the second molar and the wisdom tooth. The cheeks are incised, and the whole hard palate and floor of the antrum can thus be inverted, and depressed below the teeth of the lower jaw. It gives an admirable *exposé* of the region, and we see no reason why it should not succeed as an osteo-plastic operation.

* 1 gramme = 15.43 grains. 205 grammes = 6 oz. 4 dr. 43 grs. Troy. Op. cit., p. 486, &c.

† The following extract from a letter received from M. Ollier, strengthens my belief in the merits of his operation:—

"LYON, 20 Mars, 1873.

"J'ai lu avec la plus grande satisfaction votre belle opération d'écartement de la joue pour l'ablation d'un fibrome naso-pharyngien. C'est un succès d'autant plus intéressant que les cas semblables (Huguier, Langenbeck) avaient donné lieu à des accidents tardifs (suppuration, chute des dents, etc.). Pour moi, je m'en tiens toujours à l'abaissement du nez; j'ai pratiqué plus de 20 fois cette opération," etc.

‡ Manual of Surgical Anatomy. By W. Roser, Professor of Surgery in the University of Marburg. Translated by John C. Galton, M.A., &c. London: Henry Renshaw. 1873.

Langenbeck's second operation is to reach the spheno-maxillary fossa. To understand the possibility of making the first bony section of this operation, we must remember that the presence of a tumor expands by absorption the fossa, and the spheno-palatine foramen. A curved incision was made from the ala nasi to the middle of the zygomatic arch; a second, from the nasal process of the os frontis, along the lower border of the orbit, to meet the first. The finger was pushed back into the spheno-maxillary fossa and a narrow saw passed on the finger through the dilated spheno-palatine foramen, and the jaw sawed across, horizontally, from behind forwards. The second saw-cut was made from below upwards through the zygoma and frontal process of the malar bone, into the spheno-maxillary fissure, and thence through the orbital plate of the superior maxillary bone, as far as the lachrymal bone. The resected portion of the upper jaw was then connected only with the nasal bone and nasal process of the frontal bone. The resected piece was then pried up and turned back over the nose. The spheno-maxillary fossa was thus fully uncovered, and also the posterior nasal fossa. The polypus was removed, and the bone replaced. Bony union took place in eighteen days.

Huguier's osteo-plastic operation for polypus was as follows: An incision was made from the angle of the mouth to the masseter; a second, around the ala nasi and down the median furrow through the upper lip. This triangular flap was turned up and exposed the upper jaw. A transverse incision separated the hard from the soft palate. The jaw was sawed horizontally from the posterior tuberosity through the antrum, to the floor of the nares. An incisor was drawn, and the hard palate was grooved with the saw, in the median line. The base of the pterygoid process was severed by strong bone forceps. By prying with a chisel, the jaw was luxated downwards, and towards the median line. Through this opening, the pharynx was exposed, and a large polypus removed from the basilar process. The jaw was then replaced. It was with difficulty kept in position, and after eight months there was no bony union. Necrosis and shedding of a sequestrum followed.

"An operation essentially the same as Huguier's," says Dr. Sands, "was performed in 1867, by Dr. Cheever. In this case, only one external incision was made, by the side of the nose to the angle of the mouth, and the pterygoid process was not divided." We would call attention to other points of difference. The soft palate and the hard palate were untouched by knife or saw. The only bony section by the saw was through the antrum, horizontally, from the posterior tuberosity of the upper jaw, into the nares. The alveolus only was cut with bone forceps. The pterygoid attachment and the hard palate were broken, the latter at the symphysis, by forcing the sawed lower half of the upper jaw downwards and inwards. Thus the entire mucous membrane of the mouth was left untouched. The tumor was cut away, and the base rubbed with fuming nitric acid; and it recurred. In eleven months, the second operation was done through the same incisions as the first. Bony union had taken place. This time, the tumor was removed, and the root and periosteum scraped away from the basilar process. It never recurred again, and nearly six years have now elapsed. Bony union took place after the second operation. There was never necrosis, or falling of teeth. Six weeks after the

first operation, he was able to chew. Twenty-seven days after the second operation, he was discharged from the hospital, with the jaw firmly in place. We have always ascribed these very perfect reunions to the fact that extensive vascular connections were preserved unbroken in the mucons membrane of the mouth and pharynx.

Roux's osteo-plastic operation is practically a resection of the superior maxillary and malar bones, without taking away the fragment. All the sections of bony attachments are made, as in an excision. The four classical sections are made through the frontal process of the malar bone, the zygoma, the nasal process of the superior maxillary and the alveolus and hard palate. In addition to this, the pterygoid attachments are cut away with a chisel. The upper jaw and malar bone, thus wholly detached, are forced upward and outward, until the interval between the two superior maxillary bones is wide enough to get access to the polypus. Should more room be needed, the other superior maxilla is to be displaced also. After the operation, the upper jaw bones are to be restored to place. Whether or not they will survive this wholesale sawing and cutting is unknown, since, we believe, the operation has never been done on the living subject.

The following extract from Dr. Sands's monograph describes the fifth and last osteo-plastic operation for polypus:—

"Lastly, Dr. Cheever, of Boston,* performed an osteo-plastic resection of both superior maxillae, for the removal of a naso-pharyngeal tumor of unusual size. The operation is thus described:—'The primary incision through the soft parts was on either side of the nose, along the natural wrinkle from near the inner canthus, around the ale, and through the commissure of the myrtiform fossa of the lips. The flaps were reflected, so as to expose the bone beneath as far upward as the malar prominences. With a narrow saw the body of the bone was divided from the tuberosity, forward, beneath the zygoma, on each side into the middle meatus. The septum nasi and the vomer were divided with strong scissors. Nothing but the posterior attachments of the upper maxillae now prevented their depression; and, hinging on the pterygoid processes, the upper jaw was brought down so as to expose the tumor. Its attachments were found to be to the body of the sphenoid bone, and to the ethmoid. These attachments, except the first, were divided by the finger, and a section of the growth was made by means of scissors as near the sphenoid bone as possible, the mass being too large to deliver altogether. With a gouge chisel, the remaining portion was scraped away and removed. The whole growth was in size and shape like a large lemon. The depressed jaw was returned to its position, and retained firmly by silver wire passed on each side through the malar bones. The soft parts were opposed by silk sutures, and the whole physiognomy perfectly reinstated.'

"Dr. Cheever's operation is ingenious, and is not, I should judge, very difficult of execution. Although it terminated fatally in the single instance in which it has been performed, I agree with Dr. Cheever in thinking that there is no danger inherent in the operation that ought to prevent its repetition."

We may be allowed to add that the vascular supply for the repair of the bony sections in this operation is excellent, since we have the whole palatine arch and both alveoli uninjured. The patient was in an exhausted and anæmic condition before the operation, and would have been likely to succumb from either of the other operations.

In reviewing these osteo-plastic operations, Dr. Sands is disposed to be dissatisfied with them all. Langenbeck's first mode he acknowledges is well adapted to nasal polypi. We agree with him in think-

* Medical and Surgical Reports of the Boston City Hospital, 1870, p. 164.

ing that Langenbeck's major operation should be restricted to tumors growing in the speno-maxillary fossa. Roux's operation, also, he is right in saying involves too great mutilation of the facial bones, without corresponding benefits, either in opening up a way to the polypus or in the chance of restoration of the parts.

Of the other modes, he says:—

"Huguier's operation has been performed by its inventor, and, with slight modifications, by Dr. Cheever, of Boston. Both patients recovered; but one circumstance in each case deserves to be mentioned. In Huguier's case, necrosis occurred, and a portion of the resected bone exfoliated, the remainder failing to unite by osseous union. In the patient treated by Dr. Cheever, the tumor recurred a year after its removal, and resection had to be performed a second time in order to expose it. These facts constitute objections to the operation, and the liability to recurrence of the disease after removal offers a strong argument against osteo-plastic operations generally."

An ingenious, but fallacious objection. We shall see, farther on, how his case, treated by excision, fared in these respects. After disposing of the osteo-plastic operations, he goes on to say:—

"Finally, let us endeavor to determine the value of ordinary excision of the upper jaw, either partial or total, as a preliminary operation. It may be remarked, in passing, that excisions of the upper jaw are, as a class, remarkably successful operations. The objections that apply to them are mainly owing to the disfigurement which they produce. We shall have occasion presently to see that this objection is almost groundless, so far as the operation of partial excision is concerned. In the next place, it may be stated that excision of the jaw affords easier access to the pharynx than any of the other methods, and thus enables the operator to attack the pedicle with the maximum chances of success. Accordingly, the probability of a recurrence will be correspondingly diminished. Neither the operations through the mouth, nor any of the osteo-plastic procedures which have been described, permit that satisfactory exposure of the base of the skull which is afforded either by partial or total resection of the superior maxilla; and it must be evident, from what I have already said, that ample space is necessary, both for the thorough extirpation of the tumor, and for the prompt arrest of the hæmorrhage that so often accompanies its removal.

"After an osteo-plastic operation, recurrence is not so easily detected; and when it does take place, the entire operation must be repeated. It remains to be ascertained, whether partial excision of the jaw, after the method of Maisonneuve, will not fulfil all the indications presented."

We now quote the description of his operation, performed by partial excision:—

CASE.—J. D., aged 20. October, 1872. Symptoms for a year past: pressure, obstruction and hæmorrhage. A large tumor was discovered distending the pharynx, and visible below the free edge of the soft palate. First operation, October 17th, through the mouth; one half the soft palate was cut and turned back. The hard palate was partly absorbed. The éraseur was slipped around the root of the tumor, which was attached to the base of the skull. The chain broke. The pedicle was then divided by scissors. Copious hæmorrhage followed. This finally ceased, in consequence of the prostration of the patient, who had several attacks of syncope. The patient rallied, but the tumor soon began to grow again. The recurrent growth presented "a fungous-looking mass in the mouth, extending forward and laterally nearly as far as the dental arch. It had grown firmly adherent to the posterior border of the septum narium." "I now decided to operate again, by making a partial excision of the jaw, and to remove the principal mass of the tumor with the galvano-caustic ligature.

"On May 10th, the patient was etherized, and I operated as follows: With

a scalpel, the tissues of the face were divided down to the bone, along a line extending from just below the right inner canthus downward beside the nose and around its right ala into the opening of the nostril; thence along the junction of the skin and mucous membrane to the middle line, and along the latter to the free margin of the upper lip, the latter being completely divided.

"The flap thus marked out was reflected upward and outward sufficiently to admit of the next step of the operation, as follows:—

"With a straight, narrow, button-pointed saw, known as Langenbeck's, the malar process of the upper jaw-bone was divided upward and inward (the right central incisor having first been drawn), and into the upper end of the saw-cut a trephine centre-pin was entered, and a circular hole made into the antrum, to admit one blade of a large cutting bone-forceps, the other blade being passed into the inferior meatus of the nose.

"With this instrument, thus entered, the section of the front and inner walls of the antrum was completed. With the same instrument, the hard palate was divided on the right side, close to the septum. The soft palate was then separated with scissors curved on the flat, from the hard palate, and the detachment of the lower part of the upper jaw completed by grasping it with Fergusson's lion-toothed forceps, and wrenching it away, the lower part of the pterygoid process coming with it. The inferior turbinated bone, which projected into the cavity thus left, was pulled away, and ready access to the tumor was then obtained.

"The tumor was found, like its predecessor, to be attached to the basilar process of the occipital, and the body of the sphenoid bone, and was adherent to the posterior free margin of the septum and hard palate, and to the right pterygoid process.

"The palatal and pterygoid processes, and the vomer, were all thinned, and in parts absorbed.

"The connection of the tumor with the septum, hard palate and pterygoid plate were first divided, partly with the scissors and partly with the finger, a very large part of the septum, and nearly all the remains of the hard palate, being removed by the process.

"The pedicle, which was very broad, was then surrounded, near the base of the skull, with a loop of platinum wire, and the latter connected with from two to three cells of a Grove's battery, the larynx and pharynx being protected by wet sponges from the leakage of heated fluids. The tumor was divided by the galvano-caustic wire in six minutes, without the least hæmorrhage.

"Examination now showed a considerable portion of the pedicle still remaining, and to this the galvano-caustic loop was again applied. Other smaller portions were removed with the fingers, aided by a large rugine, and the last piece left, in part, with scissors. The use of the latter was followed by a certain amount of bleeding, soon checked by the application to the stump of the galvano-cautery, and the persulphate of iron, aided by pressure, and by the ligation of an artery in the pterygoid fossa.

"After all had been removed of the tumor that could be, a small prolongation of it was discovered running into the sphenoidal cells; and this I deemed it imprudent to attack.

"The flap of soft tissues was now replaced in position, and secured by one twisted and a number of interrupted sutures of silver and fine silk.

"Very little blood was lost during the operation, which lasted at least two hours, nor did what was lost penetrate the glottis to any dangerous degree.

"Microscopic examination showed the tumor to be essentially fibrous, the bundles of fibrous tissue being mingled with a certain amount of young cells, which were especially numerous beneath that point on the free surface of the growth from which the first tumor had been removed.

"The patient recovered rapidly after the operation, and was allowed to sit up on the ninth day, union by adhesion having taken place through the entire extent of the external wound."

There can be little doubt, in our opinion, that this was a case more suited to the operation of total extirpation of the jaw, than to any partial excision, or osteo-plastic operation. The growth was rapid; "fungous;" the seat of previous hæmorrhages; it penetrated even to the sphenoidal cells, and it contracted adhesions. Had the whole jaw been taken away, perhaps even readier access would have been got to the upper limits of the tumor. At any rate we submit that the history of this case affords no argument against the utility of osteo-plastic operations in cases of ordinary fibrous polypus, since they are not strictly comparable with it. Neither can it be asserted that a displacement of the jaw, as in our case, would give rise to a greater chance of recurrence than this excision after Maisonneuve, where a portion of the growth was left behind. The whole point of recurrence turns upon the place from which the tumor grows. Experience proves that a growth confined to the body of the occipito-sphenoid bone will not grow again if the periosteum, in which it is implanted, is rasped away from the bone. The history of twenty operations by displacement (Ollier's operation), proves that this region can be effectually reached, and cleared of even the largest polypi, without excising or taking away any portion of the bony structures of the face. Our own case of two operations on the same patient proves that a recurrence can be detected, operated on and cured, by a repetition of the operation for displacement of the upper jaw, and that complete repair will take place, after new osseous growth is cut through and replaced for the second time. It seems to have been overlooked that we possess, in the laryngeal mirror and the rhinoscope, a ready means of viewing the condition of the pharynx, and the commencement of any recurrent growth. This was used by an expert on our patient, before the second operation.

After a thorough review of all the measures which have been adopted to remove naso-pharyngeal polypi, we feel justified in drawing the following conclusions:—

1. The excision, partial or complete, of the upper jaw is applicable only to the removal of tumors which grow from, or are attached to, some portion of that bone.
2. Tumors having their origin either in the spheno-maxillary fossa, the posterior nares, or the body of the occipito-sphenoid bone, can be attacked and completely removed by one of the operations for displacing the upper jaw, or the nose.
3. In this second class of cases, to remove any portion of the bony structures of the face, when they are unaffected by disease and could be displaced and restored, is to cause a needless mutilation, and is contrary to sound principles of conservative surgery.
4. For tumors in the spheno-maxillary fossa, Langenbeck's major operation is applicable.
5. For the growths in the posterior nares and top of the pharynx, Ollier's operation by displacing the nose; or Huguier's operation, modified by us in keeping the vascular connection of the palate and pterygoid processes unbroken, will either of them prove sufficient to eradicate the disease.
6. In very large tumors, there is no reason, *à priori*, why our operation of displacing the *whole* upper jaw should not succeed.