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ORIGINAL ARTICLES.

NASAL FIBROMATA.

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Under this title it is proper to include only neoplasms of a purely fibrous or predominating fibrous structure which originate in the nasal fossæ anterior to the naso-pharynx. Tumors in this situation are prone to assume a compound type, *e. g.*, the fibromyxomata and the fibro-sarcomata. The scope of this paper will not permit of consideration of these, notwithstanding their intimate relationship to the fibromata. Likewise of fibromata which originate in the neighboring sinuses, and which involve the nose only secondarily, must such meagre mention suffice as is essential to the elucidation of the nasal growths proper.

Recent literature has contained numerous reports of cases of *naso-pharyngeal* fibromata, recounting the various operative procedures for their removal, including preliminary subperiosteal resection, resection of the hard palate by Gussenbauer, osteoplastic resection of the superior maxilla by Langenbeck, Rouge's operation and the recent method by Furneau-Jordan. Nor have rhinologists failed to emphasize the advantages of the intra-nasal or intra-pharyngeal galvanocautery method as I will urge in nasal cases the use of similar means in preference to the other graver, disfiguring, and sometimes fatal operations.

Fibromata originating primarily in the nose anterior to the naso-pharynx are comparatively rare. The *Internationales Centralblatt für Laryngologie, Rhinologie und verwandte Wissenschaften*, a journal of abstracts of all current literature pertaining to these departments, does not contain a report of a single case during the last three years.

None are included in 265 cases of nasal neoplasm reported by Hopman, of Cologne (248 cases), and Schimegelaw, of Copenhagen (17 cases). Of this series there were 121 myxomata, 63 myxomatous hypertrophies of turbinated bodies, 24 papillomata, 1 lupus and 1 sarcoma.

Yet their occasional occurrence has been recognized probably from the time of Hippocrates, who

had a large experience in connection with nasal polypi. "In cases of *hard* polypi Hippocrates¹ directed that the nostril should be slit open in order that the tumor might be thoroughly extirpated, and the roots afterwards destroyed by the hot iron."

Celsus² treated polypi in various ways, but he strongly disapproved of meddling with the *harder* tumors, which he considered malignant.

Modern authors treat briefly of the subject. Stoerk³ mentions fibromata as originating from the submucous structures. Cohen⁴ briefly but lucidly describes the neoplasm and mentions its comparative infrequency. Sajous⁵ mentions the roof as its favorite site in the nose, but remarks that cases have been reported in which fibrous polypi sprang from the septum, the inferior turbinated bones, and even the floor of the nose. He further notes the rarity of its primary occurrence.

Wagner⁶ writes: "Fibromata may develop in any portion of the nasal cavity: the floor of the fossæ, the turbinated bones, or lateral walls," and reports two cases.

Robinson⁷ thinks it so unusual in the nose and so usual in the naso-pharynx that he considers difference in location a point in diagnosis between fibroma and myxoma.

Mackenzie⁸ has reported a single case of his own and two others probably fibromata, and remarks in this connection: "Though fibrous polypus of the naso-pharynx is not unfrequently met with, this form of tumor extremely seldom originates in the nose itself; the only case, so far as I am aware, in which such a growth has been proved to exist being one of my own. There are, however, two other instances in which there is every reason to believe the tumors were fibromatous." It seems probable, however, that nasal fibromata are really more numerous than the few cases recently reported would indicate—a probability which tends to enhance our interest in the subject.

Growths in the nose and naso-pharynx in a measure correspond in type to the structural elements of the tissue from which they originate. The nasal mucous membrane consists of two layers: a superfi-

¹ De Morbis, lib. ii, Lettré's Ed. Paris, 1851, vol. ii, p. 51. Mackenzie, Diseases of the Throat and Nose, Wood's Ed., vol. ii, p. 245.

² De Comt. pharm. sec. locos., lib. iii, cap. iii. Mackenzie's, loc. cit.

³ Klinik der Krankheiten des Kehlkopfs, der Nase und des Rachens, S. 90.

⁴ Diseases of the Throat and Nasal Passages. 1880, p. 392.

⁵ Diseases of the Nose and Throat. 1885, p. 146.

⁶ Diseases of the Nose. 1884, p. 134.

⁷ Nasal Catarrh and Allied Diseases. 1885, p. 256.

⁸ Mackenzie. Diseases of the Throat and Nose. Am. Ed. ii, p. 375.

cial mucous stratum which is covered by epithelium, and a deep fibrous layer which has the position and functions of periosteum and perichondrium.⁹ In the upper or olfactory tract these two strata are closely adherent, while in the lower or respiratory tract they are separated by variable quantities of connective tissue. The fibrous layer has been shown by Panas¹⁰ to be especially abundant and more densely fibrous at the upper and posterior part of the septum and the immediately adjoining space on the base of the skull, hence the frequency of naso-pharyngeal fibromata, while in the anterior nares it is least abundant, and hence the more common occurrence in this location of the myxomata. Further, between these sites, around the posterior nares, the membrane presents a kind of transitional form, and growths in this situation are likely to present a corresponding fibromucous type. This observation, in connection with the assertion of Stoerk¹¹ that polypi arising from the mucosa (superficial layer) are of mucous structure, while those arising from the submucosa or periosteum are fibrous, affords a reasonable explanation of the comparative infrequency of true nasal fibromata. True, the attachments of ordinary myxomata are sometimes traceable to the periosteum or to the bone, but it is probable that they have first originated in the superficial mucosa and only subsequently penetrated to the deeper structures; or else, as Woakes¹² suggests, they have taken deep origin from the mucous elements which dip into and line the cells of the spongy bones.

Nelaton, cited by P. Koch,¹³ has advanced the opinion that fibrous polypi of the nose are never of a primary nature, but always proceed from neighboring sinuses, *e. g.*, the antrum of Highmore, etc. A practical refutation of this theory is furnished by a case reported by Gerdy in which, on post-mortem examination, a fibroma was found to be attached to the posterior part of the vault of the left nasal fossa.

Fibromata may arise from any part of the nasal cavities. The vault, especially its posterior portion, is the favorite site, since here is found in greater abundance the fibrous stratum from which they primarily originate, but the turbinated bodies, the cribriform plate of the ethmoid bone, the septum, and the floor of the nose may furnish points of origin. More or less extensive secondary adhesions may form in the course of the expansion of the growth as the result of friction and pressure, so that it is sometimes difficult to determine the original point of attachment.

Of the accessory cavities the antrum of Highmore is a favorite site of origin, fibromata in which become very large and encroach secondarily upon the cavities of the nose and orbits, and next in order are the frontal sinuses, tumors from which extend into the same cavities.

The etiological factors in the development of fibro-

mata are not definitely known, but a local irritation from traumatism may serve to excite a hyperplasia of the fibrous elements, as in one case of fibroma of the septum which was directly attributable to a blow on the nose. In other instances a localized perversion of the chronic hypertrophic inflammatory process may act as the exciting cause by stimulating the fibrous elements to unusual proliferation.

Both sexes and all ages seem equally liable. In this respect the disease differs from naso-pharyngeal fibroma, of which Lincoln¹⁴ collates 38 genuine cases, all of them males under 25 years of age. Nelaton,¹⁵ cited by Mackenzie, knew of no example of *naso-pharyngeal* fibroma becoming developed in a female of any age or in a male over 35. Of six cases of nasal fibroma collected in this paper three were females, one of 35 years, one of 39 years and one of 50 years of age.

The rapidity of growth, as indicated by the duration of the symptoms up to the time of operation, averages about two years. The early symptoms are those of a catarrhal nature, followed by obstruction and distension of the fossa. Its development continues to the detriment of bones or cartilages that may be in the way. These are absorbed, enveloped and rent asunder, the neoplasm penetrating into fissures, accessory sinuses and neighboring cavities. The bridge of the nose is flattened, the eyes bulged forward and the cheeks swollen, the whole constituting the hideous deformity known as "frog-face." Frequent and dangerous attacks of epistaxis may proceed from surface ulcerations. Extension upward may open the cranial cavity.

A probable diagnosis is not difficult. Its appearance *in situ* differs much from that of the mucous polyp. It is not multiple, but may be lobulated. The base is broad, the color is dark red, there is no translucency, and it is firm and resistant to pressure by a probe. It is more difficult to distinguish it thus from fibro-sarcoma and sarcoma. The microscope is the only means of positive diagnosis.

Fibrous tumors in this situation present the ordinary pathological characters of fibromata in general. In consistence they vary, being sometimes very dense and at other times softer and more succulent. The fibres which constitute the chief part of the growth are grouped in bundles of various sizes, or are simply closely interlaced and devoid of definite arrangement. A few minute cells, either round or spindle-shaped, may be present among the fibres or in larger numbers around the blood-vessels. The vessels are not usually numerous, but it is probable that the tumors, or parts of them, may partake at times of the erectile structure of the turbinated bodies. A smooth fibrous capsule usually envelops the whole.

Concerning the prognosis, nasal fibroma tends to degenerate into sarcoma when it is incompletely removed, or even without any interference. There is a tendency to recurrence after removal, although, if thoroughly extirpated and the base cauterized to the bone, the prognosis should be good.

⁹ Mackenzie. Am. Ed. ii, p. 238.

¹⁰ Bull. de la Soc. de Chir., 1873. Mackenzie. Diseases of the Throat and Nose. Wood's Ed., vol. ii, p. 368.

¹¹ Die Krankheitender Nase, 1880, S. 90.

¹² Nasal Polypus, etc., in Relation to Ethmoiditis, 1887, p. 9.

¹³ Internationales Centralblatt für Laryngologie, Rhinologie und verwandte Wissenschaften, December, 1885, p. 256.

¹⁴ Archives of Laryngology, October, 1883, p. 258.

¹⁵ Rapport sur les Progrès de la Chirurgie, Paris, 1867, p. 235. Mackenzie. Diseases of the Throat and Nose, vol. ii, p. 497, Am. Ed.

I have tabulated and appended the records of eight cases, including one of my own which is also related in detail:

Mrs. R., æt. 39 years, first had a nasal polypus described as an ordinary myxoma removed from the left nasal fossa, by means of forceps, about ten years ago. She remained well for five years and then again noticed gradually increasing obstruction, and later a dark reddish mass presenting at the left anterior nasal aperture. Four years ago she submitted to operation under chloroform. The operation was a failure, only a few small pieces being removed by means of forceps and without the aid of artificial illumination. Severe hæmorrhage was occasioned at the time and continued intermittently for weeks. No relief was afforded. She declined further interference until February, 1886, at which time she came under the observation of Dr. W. T. Coleman and Dr. A. P. Gilmore, of Chicago, through whose kindness I have a portion of the record. The left nostril was much distended, showing evidence of commencing frog-face, and the fossa anteriorly was thoroughly filled in all directions by a firm elastic tumor which projected slightly from the anterior aperture. There was no undue prominence over the antrum of Highmore, nor encroachment upon the orbit. These gentlemen operated skilfully by means of the galvano-cautery. Efforts to include the neoplasm failed on account of its large size, tight fit and numerous adhesions. So the lower portion was slit up by the knife electrode, some adhesions separated in like manner, and a large section, perhaps one-half of the tumor, extracted by means of forceps. The operation was necessarily prolonged, painful and bloody. Through the courtesy of Dr. Coleman, the case was now referred to me.

Status Præsens.—Examination about ten days subsequent to the operation just described, March 4, 1886. The left half of the external nose is decidedly more prominent than the right. The left nasal fossa above the line of the inferior turbinated body is completely filled by a firm, elastic, irregularly lobulated neoplasm. No middle turbinated body is discernible, its position being occupied by tumor. The inferior meatus is free, corresponding to the portion of the growth already removed. The anterior two-thirds of the septum narium has been pressed far over to the right, narrowing the right fossa and enormously increasing the capacity of the left chamber. Rhinoscopic inspection posteriorly shows the nasopharynx to be approximately normal. Only a faint outline of the tumor, located well forward, can be seen through the left choana. The posterior part of the septum is in the median line.

First Operation, March 10, 1886.—The affected nostril was first thoroughly cleansed by cotton swabbing and by means of a condensed air spray of Dobell's solution. The parts were illuminated by the ordinary method of reflected gas rays projected through the anterior aperture, which was widely dilated by a bivalve speculum. Complete local anæsthesia of the entire nostril was induced by hydrochlorate of cocaine applied in the form of a spray of a 5 per cent. solution repeated three or four times at intervals of three minutes, followed by a 10 per cent.

solution on cotton introduced and allowed to remain in contact with the fibroma for three minutes. I employed Flemming's galvano-cautery *écraseur*, devised by Seiler, which consists of a universal handle into which is inserted a pair of parallel tubes threaded with wire. The ends of the wire fall through eyelets, one on each side of the wheel in the axle-bar of the windlass, which is inserted into a slot in the handle so located that while holding the handle the loop can be wound in on the windlass by means of the thumb. I substituted steel or a tempered iron wire (piano wire No. 5) for the platinum usually employed. Platinum is devoid of resiliency, a property that enables the *écraseur* loop of steel wire to retain or regain its contour after contact, when one of platinum would remain permanently indented. The steel loop offers some resistance to tissues against which it is pressed, thus facilitating envelopment of the part. The steel wire is sufficiently tenacious and takes the glow from the battery practically as well as platinum, but a fresh piece must be used at each application. Before threading the parallel tubes it is well to withdraw the temper from the ends of the wire by heating them to redness, as the portion thus rendered ductile will wind more easily around the windlass.

I would catch in the *écraseur* the most easily enveloped lobule or corner of the growth, then connect the battery by running down the treadle with my foot, and at the same time wind in the loop, thus severing, without pain and with little or no hæmorrhage, a cubic centimetre or more of the growth. By a repetition of the process three or four such pieces would be removed in a sitting. Occasionally it became necessary to make a preliminary incision into the substance of the tumor with the knife electrode in order to prepare a place for the wire, or by the same means to detach an adhesion that the *écraseur* might take hold. The operations were repeated weekly, the patient using a cleansing spray in the interval. They might have been performed more frequently, every day or every alternate day for a time, thus shortening the duration of treatment, but the slower method sufficed and for good reason was preferable in this case.

During the course of some weeks the growth was thus followed up to its primary attachments, which extended along the horizontal plate of the ethmoid bone backward to the anterior surface of the body of the sphenoid. I regard the posterior portion of the vault, including the anterior perpendicular surface of the sphenoid bone, as the point of origin of the tumor, the base of which extended thence along the cribriform plate of the ethmoid bone, becoming adherent at the same time to portions of the superior turbinated body and the walls of the ethmoid cells. The absence of the middle turbinated body, which had been reduced to a rudiment by absorption from pressure, permitted more brilliant illumination of the parts above and not only facilitated operation, but enabled me with certainty to follow the tumor to its base. After the removal of all portions which could be included in the snare, I cauterized the base by means either of the galvano-cautery point, knife, or moxa electrode, causing the instrument to penetrate

TABLE OF OPERATIONS FOR NASAL FIBROMATA.

No. Date.	Operator and Reference.	Sex.	Age.	Previous Duration of Symp- toms.	Situation and Extent.	Point of Attachment.	Pathological Nature.	Treatment.	Result.
1. 1833.	Gerdy. Des Pol- ypes et de leur treat- ment, Paris, 1833, p. 10. Mackenzie: Dis. of Throat and Nose, Vol. II, p. 375, Am. Ed.	Male.	13	1½ yrs.	Left Nostril.....	Posterior part of the vault of the left nasal fossa. De- monstrated by an autopsy.	Fibroma. Substance firm and elastic. On section seen to be of purely fibrous structure. No microscopic examination.	Failure of attempt at removal by ligature and evulsion, fol- lowed by an attempt to cut thro' the base of the polypus with a bistoury, resulting in death from hemorrhage.	Death from ham- orrhage.
2. 1872.	Lichtenberg. Lan- cet, 1872, Vol. II, p. 773. Mackenzie: Dis. of Throat and Nose, Am. Ed., Vol. II, p. 375.	.....	.....	.....	.....	Upper turbinated body and cribriform plate of eth- moid.	Fibroma. No microscopic ex- amination.	.....	.....
3. 1877.	Morrell Macken- zie. Dis. of Throat and Nose, Am. Ed., Vol. II, p. 376.	Female.	35	2 years.	Pedunculated solid growth size of pigeon's egg, obstructing and pro- jecting through the left choano into the naso-pharynx.	Roof of nasal fossa well within the nasal cavity.	Fibroma. On section, hard, dense and pale, microscopically, closely interlaced whitish fibres, with a few minute cells.	Evulsion with forceps through naso-pharynx.	No subsequent his- tory given.
4. 1879.	Kempf. Louisville Med. News, 1879, Vol. VII, p. 65. Wag- ner: Dis. of Nose, 1884, p. 207.	Female.	50	1 year.	Left nostril entirely occluded. "Frog-face" appearance, left eye bulged forward; after removal size of goose egg, containing in its centre bones forming septum of nose.	.....	Fibroma.....	Unsuccessful attempt at re- moval by forceps; severe ham- orrhage. Finally, crucial inci- sion over the left side of bridge of the nose, and bones lifted out. Tumor then pulled out by finger.	Recovery. No re- currence six months later.
5. 1882.	Buchanan. Glas- gow Med. Journal, 1882, XVII, p. 211. Wagner: Diseases of Nose, 1884, p. 216.	Male.	21	2 mos.	A firm reddish elastic swelling, projecting down in front so as to ap- pear outside the <i>ala nasi</i> and grow- ing from the cartilaginous septum on each side. Exciting cause, a blow on the nose.	Septum nasi.....	Fibroma. Microscopically well defined fibrous tissue; here and there clump of round cells close to blood-vessels, probably in- flammatory.	Column divided at its base and turned up; septum grasped by vulsellum and twisted from posterior attachment.	Immediate union. No subsequent his- tory.
6. 1883.	Jacquemart. An- nales des Maladies de L'Ouille du Lar- ynx, du Nez, etc., Mai, 1883, p. 69.	Male.	29	.....	Multilobular tumor on each side, nose flattened and dilated. Mass- es of firm consistence, protruding from each side, having an aspect more fibrous than mucous. Quite vascular and resistant.	Superior turbinated body and anterior part of superior meatus.	Fibro-myxoma, with greatly predominating fibrous structure. Also some smaller myxomatous growths. No microscopic ex- amination.	Removed in 50 pieces by cold wire snare in 15 sittings. Pre- vious attempts by forceps failed.	Recovery.....
7. 1884.	Janselmec. An- nales des Maladies de L'Ouille du Lar- ynx, du Nez, etc., Nov., 1884.	.....	2 years.	Left nasal fossa, occasioning de- formity of nose. Pedunculated.	Posterior part of septum.	Included in this table because fibrous elements predominated, and because probably it origi- nated as a fibroma.	Fibro-sarcoma (microscope).	Exposed and removed by a medium incision through the bridge of the nose.	.....
8. 1887.	Casselberry. Sec- tion in Laryngology, Ninth Int. Medical Congress, Washing- ton, D. C.	Female.	39	5 years.	Left nasal fossa; slight projection from anterior aperture; commencing "frog-face;" total occlusion of nos- tril; naso-pharynx approximately of normal. Estimated size, that of a salivary gland.	Horizontal plate of eth- moid bone and anterior per- pendicular surface of body of sphenoid bone (roof of nasal vault).	Fibroma. Microscopic exam- ination. Composed entirely of irregularly arranged bundles of fibres.	Removed piecemeal by gal- vano-cautery, assisted by knife electrode, and its base cauterized by same means. Re- peated sittings.	Recovery. Well at the end of 17 mos. Note.—Continues well without further recurrence at the end of 24 months.

each time to the bone. This also I did a small part at a time, fearing to produce much inflammatory action on account of the proximity to the cerebral meninges through the cribriform plate of the ethmoid bone. I cauterized everything which had any appearance of fibroma, preferring to touch that which was not fibroma rather than to leave untouched that which was. At the end of six months the tumor seemed thoroughly eradicated. The fossa above the inferior turbinated body was unoccupied by anything but rudiments of the middle and inferior turbinated bodies, the view of the vault in all directions being uninterrupted.

At the end of nine months a recurrent tumor the size of a small bean was discovered attached to the lateral wall, just above the anterior ends of the inferior turbinated body. Probably a point of secondary attachment here had escaped cauterization and redeveloped, for on account of the recession of the lateral wall it was at a point difficult of illumination and access, being just within the anterior aperture, but around the corner, as it were. This tumor was removed by the same means. At the end of seventeen months there is no appearance of any further recurrence, although in view of the known tendency to relapse in such cases she cannot even yet be considered wholly free from liability to redevelopment. I am indebted to Dr. Elbert Wing, Demonstrator of Pathology in the Chicago Medical College, and Pathologist to Cook County Hospital, for the microscopic examination of sections of the tumor which, confirmed also by my own examination, demonstrated it to be a fibroma.

Treatment.—Of the seven other cases appended, in No. 1 attempts at removal by ligature and forceps failed, and were followed by an attempt to cut through the base of the polypus with a bistoury, which resulted in death from hæmorrhage. The treatment in case No. 2 is not stated. In case No. 3 the tumor projected posteriorly and was removed by forceps introduced through the naso-pharynx. In three cases, Nos. 4, 5, and 7, external operations were performed to give access to the tumor: in No. 4 a crucial incision was made over the left side of the nose, and the nasal bones were lifted out; in No. 5 the nasal column and septum were divided and the nose turned up; in No. 7 a median incision was made through the bridge of the nose. In case No. 6, possibly fibro-myxoma, the tumor was successfully removed, piecemeal, in fifteen sittings, by a cold wire snare. The advantages of the intra-nasal, galvano-cautery method, as detailed in my own case, are sufficiently obvious. General anæsthesia is unnecessary and the consequent shock and dread of operation are avoided. There is no external disfigurement, no dangerous hæmorrhage, and under cocaine, little or no pain. My patient would sit in the operating chair and have piece after piece removed without manifesting even discomfort. It is certainly a more brilliant operation, when possible, to encircle the entire tumor and remove it *in toto* at one sitting, but in case of the larger fibromata this will usually be impracticable on account of the impaction of the mass into the inequalities of the nasal fossa, and the

formation of adhesions. Moreover, the slower method of removal, piece by piece, offers the advantage of greater deliberation, implying also as it does greater precision, for when sufficient oozing occurs to interfere with the view further action is postponed until the next time. By repeated sittings the patient becomes accustomed to manipulation and learns to assist the surgeon by holding correctly. The surgeon also in turn by repeated opportunities to study the parts becomes so familiar with the area over which he is working that he can readily trace out all the ramifications of the growth. No undue inflammatory reaction follows and sepsis can be avoided by thorough cleansing of the nostril by means of an antiseptic spray.

In the case of Mrs. R., to whom any facial disfigurement would have been exceedingly abhorrent, the galvano-cautery used in this manner was the one means which rendered a formidable external operation avoidable. The nature of the case would have precluded an effective intra-nasal use of the cold-wire snare, ligature, forceps, or chemical caustics.

An agent capable of effecting such brilliant results naturally engenders an enthusiasm which is liable to lead to its abuse and a word of caution is not unnecessary in this respect. Accurate diagnosis, precise indications for its use, and a certain amount of skill on the part of the operator are essentials to the judicious employment of the galvano-cautery. And it must not be supposed that *all* cases of nasal fibroma will be susceptible of this means of cure. Enormous size and penetration into accessory cavities may render it ineffective.

Electrolysis has been successfully employed by Lincoln in naso-pharyngeal fibroma and it might prove serviceable in nasal fibroma of enormous growth, at least to reduce the size to such a point that the galvano-cautery could cope with it, thus avoiding an external operation.

An analytical record of cases is given.
70 Monroe Street.

A CASE OF LARYNGEAL GROWTH.

Read before the Medical Society of the District of Columbia, December 14, 1887.

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Operations for the removal of laryngeal growth are of such common occurrence and the subject has been so thoroughly treated by laryngologists, that there would seem nothing new or interesting upon this subject to be added. The case I am about to report, while not individual, is one of uncommon nature and presents certain points of interest.

On November 4, 1886, Mr. W. E. S. was referred to me by Dr. Z. T. Sowers, with the following history: The patient had been unusually free from sickness of any character previous to the development of the present affection. His family history is excellent, no hereditary tendencies being found upon either paternal or maternal side. When about the age of 11 he began to sing as chorister boy, filling a soprano