

CASES ILLUSTRATING VARIOUS

Sex.	Age.	Symptoms complained of.	Duration.	Nasal conditions.	Relationship between nose and symptoms complained of, and how determined.
F.	24	Intense supra- and infraorbital neuralgia, right side of face.	Four years.	Exostosis of right lower turbinate pressing on septum.	Shrinking under cocaine relieved pain at once.
M.	36	Severe pain in head	Two years	Intranasal pressure from spur of left nostril.	Constant pain more noticeable during cold in head.
F.	23	Headache	Two to three years.	Chronic hypertrophied rhinitis.	Headache worst when hypertrophy is greatest.
F.	40	Sick headache (migraine) with complete prostration.	Each attack several days.	Sharp exostosis buried in posterior end of inferior turbinate.	Increased tension in nose from any cause brings on attack.
M.	..	Headaches, chorea, pain in eyes; inability to fix vision.	Several years	Polypus in left nostril; closed ethmoid cells.	Complete relief from treatment of nose; none from other measures.
F.	23	Following nervous excitement had increased conjunctival congestion, lachrymation and profuse watery nasal discharge.	Three to four years.	Septum thick; spur on one side; turbinate boggy; polypoid degeneration of left middle turbinate which was pressing against septum.	By result of treatment
F.	37	Headache; inability to fix vision; chorea in arms and legs; skin sensations neurotic type. For years in sanatoriums. Diagnosis of petit mal (neurotic family history).	Several years	Both middle turbinates solid; no cells.	By result of treatment
M.	13	Unable to swallow solid food since early childhood; if attempted always vomited.	Many years	Adenoids	Suggested as possible cause
F.	37	Indigestion with cough	Several years	Reported nose perfect but examination showed spur in each nostril and hypertrophied tubercles of each septum.	By results of examination and treatment.
F.	20	Dysmenorrhoea	Several years	Hypertrophy of middle turbinate	Results of treatment
F.	41	Diffuse oedema joints, hand and ankle		Polypoid degeneration of mucous membrane near hiatus semilunaris.	
M.	9½	Tachycardia		Pedunculated myxofibroma of the posterior end of middle turbinate.	
M.	10	Temporary insanity	One week	Followed removal of adenoid and operation for deflection of septum, done under ether.	Seemed to be due to effect of plugs placed in nose to hold septum in position.

having been given the author in the form of personal communications, and to the writers of which he desires to express his indebtedness.

George L. Richards.

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NASAL CAVITIES, DISEASES OF: NEW GROWTHS.

—Perhaps contrary to what is quite generally believed, new growths in the nose are exceedingly rare. Mucous polypi, spurs, and thickenings of the bony and cartilaginous septum are seen more commonly than any or than all forms of new growths combined, but, being of purely inflammatory origin and not tumors in the true sense, are not described under this heading.

Moritz Schmidt, among 32,997 nose and throat patients seen in ten years, found that but 24, or 1 in every 1,370, presented some form of true neoplasm in the nose. Of these, 757, or 1 in every 43, had mucous polypi; *i. e.*, mucous polypi occurred more than forty times as often as all forms of true new growths combined. Of benign and malignant neoplasms, there would seem to be about an equal proportion; if anything, malignant growths appeared more often than benign tumors.

1. BENIGN NEOPLASMS.

ANGIOMA.—This new growth is usually found on the septum and is composed almost entirely of blood-vessels, generally large cavernous veins, surrounded by a slight network of connective tissue, its epithelial covering being the same as that of the part from which it sprang. Bosworth says that it may be located in any part of the nasal cavity; however, if seen anywhere but on the septum, it is probably but a localized hypertrophy of the mucous membrane in which the vascular changes are most marked. It occurs at all ages, most frequently in early life, when it may be congenital, and very rarely in old age. It is a soft, rounded, mulberry-like growth, varying in color from a bright red to a purple, movable, pedunculated or sessile, bleeding easily on touching with a probe, and, as before stated, is almost invariably found on the anterior part of the septum. The tumor may be reduced or emptied by pressure, and, if connected with an artery, pulsation may be detected. Frequent attacks of nosebleed, always beginning on the same side, constitute the earliest symptom. The epistaxis may be alarming and difficult to control. Nasal stenosis on the affected side develops with the growth of the tumor, which may be rapid or slow. More or less discharge is likely to be present. There is no pain.

Treatment consists in the removal of the growth by the cold wire snare under cocaine anaesthesia and adrenalin to lessen the hemorrhage. If the growth be pedunculated, the application of the snare is simple; if it be sessile, a needle transfixes the growth at its base, the loop of the snare being thrown over this; and in either case one or two hours should be taken in removing the tumor. Recurrence does not take place if the removal has been complete.

BONY CYSTS.—Osseous cysts in the nose are not rare. When present, they are found invariably at the anterior end of the middle turbinate bone in persons above twenty, and much oftener in women than in men. The etiology is interesting—several theories having been advanced as to the mode of their production. McDonald thinks the lesion was originally an "osteophytic periostitis," secondary to an hypertrophy of the mucous membrane of the middle turbinate, causing the inferior border of this to curl outward and upward until it met the body of the bone above where at length adhesion took place, finally causing a closed bony cavity lined within and without with mucous membrane. Another explanation is that the cyst results from a rarefying osteitis, the inflammation beginning in the mucosa, involving later the periosteum and bone, and finally resulting in the porous formation observed in other hyperplastic processes. A simpler and more probable explanation than either of these is to be found in the fact that there frequently exists in the anterior end of the middle turbinate bone an ethmoid cell, which communicates with the middle meatus or with the other cells of the ethmoid labyrinth. Inflammation causes complete or partial stenosis of the orifice, the secretion is retained, and the cell gradually becomes larger as the walls distend, until finally there is produced a bony cyst. This is covered externally with mucous membrane that may either be normal or have undergone polypoid degeneration with polypi resulting, or, again, may have atrophied. The mucous membrane lining the cavity has columnar ciliated epithelium, and, through pressure of the retained secretion, often becomes attenuated, the glandular elements undergoing absorption, the membrane becoming polypoidal or granulating. The cyst contains air or may be filled with a yellow viscid fluid, muco-pus, or clear pus. On several occasions the writer, on opening the cyst, found a mucous polyp present in the cavity.

TIES OF NASAL NEUROSES.—Continued.

Treatment.	Result.	If improvement, has it continued?	Reporter.	Where reported.	Remarks.
Removal of right lower turbinate with saw and scissors in 1898.	Complete cessation of pain.	Yes	P. S. Donellan.	Personal communication.	
Removal of spur	Instantaneous relief from pain.	Yes	G. D. Murray.	Personal communication.	
Chromic acid to turbinates	Relief	Yes, for six years.	J. C. Thompson	Personal communication.	
Shrinking turbinate with cocaine, and suppurative, as patient declines operation for permanent relief.	Temporary relief.		J. A. Kenefick.	Personal communication.	
Removal of polypi; opening of ethmoid cells.	Cure	Yes	P. J. Gibbons.	Personal communication.	
Removal of left middle turbinate and the septal spur.	Complete relief	Yes	J. F. McCaw	Personal communication.	
Opened through middle turbinates and drilled into left sphenoid sinus; antipyrin and suprarenal locally; general tonic treatment.	Cure	Yes, has gained thirty pounds.	P. G. Gibbons.	Personal communication.	Was of suicidal tendency and when worse iodine was detected in secretions.
Removed	Swallowed solid food next day.	Yes	Unable to credit as reporter did not sign name.	Personal communication.	Reporter thinks trouble due to abnormal reflex causing spasm of pharyngeal and cesophageal muscles.
Removal of spurs and hypertrophies of septum and of diseased tonsils by electro-cautery dissection.	Entire disappearance of cough and indigestion.	Yes, six years	Ed. Pyncheon	Personal communication.	
Usual surgical measures	Cure	Yes, six years	Henry L. Wagner.	Personal communication.	
Surgical	Cure	Yes, eight years.	Henry L. Wagner.	Personal communication.	
Surgical; removal	Cure	Yes	Henry L. Wagner.	Personal communication.	
After removal of plugs was all right in a few days.	Cure	Yes	Author's case.		

tom. The pain is referred to the inner side of the eye, radiating to the forehead or across the face, causing often intense trigeminal neuralgia. There is a feeling of pressure and throbbing. Actual exophthalmos may occur from the outward pressure. Attacks of megrim with vertigo and partial unconsciousness and vomiting are often complained of. Nasal obstruction, depending upon the size of the tumor, is present on the affected side and may be quite marked in the opposite naris.

Prognosis is good and recurrence is not to be expected following proper treatment.

Treatment is surgical and consists in the removal of the cyst (under local anaesthesia) by the cold wire snare, Grunwald's or other nasal cutting forceps.

FIBROMA.—Fibroma is a connective-tissue growth, somewhat resembling histologically the mucous polyp, but differing from it in the large amount of connective-tissue fibres crowded together with but few intervening interstitial spaces. The epithelial covering is the same as that of the polyp. It springs from the submucosa or outer layer of the periosteum, and arises from the posterior third of the middle or superior turbinate bodies or from the roof of the nose, and is said never to spring from the septum. It may arise in the sinuses, and often extends from the nasopharynx into the nasal fossae. It has a rather thick, firm pedicle or may have a very broad base. If pedunculated, the growth is downward and backward into the nasopharynx, where it appears as a round or pear-shaped grayish-pink tumor, firm and hard to the finger, bleeding easily on probing, having a rather smooth surface, and tending to fill the postnasal space. In the nose it is of the same character, but is longer and more slender, conforming to the shape of the nasal cavity. Its growth is steady and persistent, pushing aside adjacent bones, causing ulceration and adhesions, invading the neighboring sinuses and orbital cavities, and producing finally much deformity, such as the characteristic frog face and exophthalmos. The tumor is very vascular and the walls of the blood-vessels are very much thinned. This form of growth occurs in early life, between the ages of fifteen and thirty or forty, and in males more often than in females. Of six cases of

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fibroma in the nose and nasopharynx seen by the writer, four were in men, two in women,—the youngest in a boy of sixteen, the oldest in a man about forty.

The *etiology* is not known, trauma possibly having to do with the development. Early in the disease the patient has repeated attacks of epistaxis, often severe, the blood coming not only from the tumor, but also from the ulcerated mucous membrane, and nasal obstruction develops first on one side, then on the other, as the nasopharynx becomes filled with the tumor. A copious watery or mucopurulent discharge constantly flows from the nose. The voice becomes thick and nasal, the mouth dry and open, the senses of smell and taste become impaired or lost, and tinnitus and impaired hearing develop. Pain is absent at first, but, as pressure on adjacent parts develops, it becomes steady. Deformity arises if the tumor is not soon removed.

Prognosis is good if the tumor be removed. If it be not removed, death will ensue from copious hemorrhages or from extension of the disease to the brain.

Removal can usually be accomplished by the cold wire snare, but it may be difficult to surround the growth. The large loop is passed through the nose into the nasopharynx, the index finger of the left hand then pushing the wire about the tumor, when the loop is drawn. The pedicle may be so hard or the base so broad that the wire may be repeatedly broken and the galvanocautery snare be required before the tumor can be severed. The pedicle or base may be cut with scissors, and in unusually large tumors it may be necessary to expose the nose by an external operation before the tumor can be removed. Profuse hemorrhage is to be expected in the removal of fibroma by whatever operation, and death has occurred during operation from this cause. Electrolysis has been employed to lessen the size and reduce the vascularity of the growth before operating.

OSTEOMA AND CHONDROMA.—These true bony and cartilaginous tumors are not to be confounded with the exostoses and echondroses so frequently met with on the septum.

Osteoma originates from the ethmoid, vomer, accessory sinuses, and other parts of the bony framework. Both the cancellous and the eburnated varieties are met with. The tumor grows steadily, though slowly, pushing everything before it, invading the orbital cavity, displacing the eyeball, and causing intense pain. The tumor has a bony connection with its point of origin or a pedicle of mucous membrane and connective tissue. It is covered with mucous membrane, and is so hard that it cannot be penetrated by an exploring needle. It is usually single, smooth or irregular, and may be of any size, depending upon the time it has been growing. The symptoms are pain, early and continuous until the pressure destroys the nerve filaments, nasal obstruction with all its results, impaired sense of smell, mucopurulent discharge, and frequent attacks of epistaxis. Exophthalmos, with or without blindness and epiphora, is produced sooner or later, as well as other evidences of external deformity. The diagnosis is made by the history of a slow growth, by the use of the probe or the needle, and in doubtful cases by the microscope.

Prognosis depends upon the extent of the tumor at the time of examination, but it is usually good. The treatment is entirely surgical and nearly always intranasal. The tumor may have to be divided into fragments by the motor trephine, bone forceps, or saw, and removed in pieces when it is too large to be extracted through the nostril. When the tumor is quite large and inaccessible, an external operation will have to be made, but much can be done by modern intranasal surgery without resorting to the more radical external operation.

Chondroma occurs less often than osteoma. It springs generally from the anterior part of the septum, but may come from the ethmoid or other accessory sinuses. It is a smooth, rounded, sessile tumor with a broad base covered with normal-appearing mucous membrane. It is found in early life. The symptoms are those of osteoma, excepting that there is no tendency to bleed. It is

differentiated from osteoma by its permeability to the needle and by its sessile base; from malignant tumors by its slower growth, absence of hemorrhage, and harder sensation conveyed through the probe.

Prognosis is good if the tumor is entirely extirpated. Removal is accomplished by the knife, saw, cold or galvanocautery snare.

PAPILLOMA.—Both hard and soft varieties of papilloma are met with in the nose. The hard variety resembles in all respects the cutaneous wart, and is confined to the vestibule and anterior part of the septum, usually of one side, and is commonly single, but may be multiple. Many cases of the soft variety have been reported, but the majority of them are not true papillomata, being nothing more than papillary hypertrophies. These latter, sometimes known as "Hopman's papilloma," are of common occurrence in hypertrophic rhinitis, occurring along the inferior border and posterior ends of the inferior turbinated bodies—sites where true papillomata do not occur. Jonathan Wright, who has investigated this neoplasm with perhaps greater thoroughness than any other rhinologist, says that only about a dozen cases of unquestioned papillomata of the nose have been recorded in literature. True papilloma appears to be restricted to the anterior part of the septum, the floor of the nose, and the anterior part of the external wall. It occurs at any age and in either sex, and is usually single, unilateral, and of small size, but may grow to be as large as a hazelnut, obstructing the nasal orifice. It may be sessile, but almost always is pedunculated, grayish-pink in color, with irregular surface and well-marked papillae, somewhat resembling a raspberry. It is very vascular, bleeds easily, causing frequent attacks of epistaxis, and has some tendency to ulceration. Pain is seldom present. There is more or less profuse nasal discharge. Unless the growth is completely removed, it is likely to recur.

Treatment.—Removal is best accomplished by the cold wire snare, and any part remaining should be destroyed with the galvanocautery. Vaseline or other emollient should be kept applied until healing has occurred, and irritation by picking the nose is to be avoided. Ingals recommends the application of the tincture of thuja occidentalis to prevent recurrence. The possibility of papilloma degenerating into or later becoming a malignant tumor, especially in persons in middle life or later, should always be borne in mind.

2. MALIGNANT NEOPLASMS.

ADENOMA, sometimes classified as a benign tumor, shows sooner or later malignant changes, undergoing either carcinomatous or sarcomatous degeneration. This has been so in nearly, if not quite all, cases which have been observed and reported. Pure, unmixed adenoma in the anterior nares is necessarily extremely rare, because of the absence of gland structure in the nose. Hopkins and Leland each reported a case of adenoma in the nose at the meeting of the American Laryngological Association in 1897, both cases ultimately taking on carcinomatous change, and Leland's showing also a transition in one part to papilloma. Mayer has recently reported (*Am. Medicine*, August 2d, 1902) a case of adenoma, showing sarcomatous degeneration in parts. The tumor is to be regarded as malignant. It presents itself as a grayish-white granular polypoid mass, firm in consistency, the surface soft and pultaceous, bleeding easily. It develops much more slowly than either sarcoma or carcinoma.

SARCOMA is the commonest form of tumor met with in the nose, if we exclude mucous polypi and other tumors of purely inflammatory origin. All varieties found in other parts of the body occur in the nose, but the round- and spindle-celled sarcomata are most frequently seen, and after these in points of frequency are myxosarcoma, melanosarcoma, and fibrosarcoma, the other forms being much more rare. Both sexes are equally attacked. The period most susceptible to sarcoma in the nose is the fifth decade, between the fortieth and fiftieth years, but

no age is exempt, cases being seen in early infancy and in extreme old age. Of eighty-four cases collected and analyzed as to age by Harris (*Phila. Monthly Med. Jour.*, June, 1899), thirty-four, or forty per cent. of the cases, were between thirty and fifty; four were under ten years of age and five between seventy and eighty.

As to *etiology*, little is known. Sarcoma is found so frequently associated with mucous polypi that there would seem to be some basis for the belief that under certain unknown conditions mucous polypi do undergo sarcomatous degeneration. Trauma, accidental or surgical, may be an etiological factor in this transformation from a benign to a malignant growth, and crude methods in operating have been suggested as a possible cause; but facts are wanting to substantiate this, too few cases bearing on this being reported to base any conclusions upon.

Symptomatology.—The earliest symptoms are unilateral nasal obstruction, progressing steadily and rapidly, and repeated attacks of nosebleed. Epistaxis is a prominent symptom throughout the course of the disease, and may become a very serious and alarming one. Discharge from the nose is profuse, at first watery, then mucopurulent and bloody, and later on the odor of necrosis makes it offensive. Pain is conspicuously absent in the early part of the disease, but, as the growth encroaches on the accessory sinuses, it becomes constant and steadily increases in severity. With the spreading of the tumor into the accessory sinuses and neighboring cavities more or less deformity of the face occurs, such as exophthalmos and fulness at the side of the nose and of the cheek with discoloration of the skin over the affected area. The growth may protrude forward through the nostril or backward into the pharynx, as in the case of a two-year-old child seen by the writer. Vision may become impaired from pressure on the optic nerve after involvement of the sphenoidal sinus. Nasal obstruction becomes so complete that the patient has great distress in breathing and in eating, speech becomes thick and muffled, the senses of smell and taste are lost or much impaired, nasal discharge becomes most profuse and offensive, pain is constant, insomnia adds to the distress, and the patient loses weight and strength, and finally dies, unless relieved by surgical intervention, from extension of the tumor through the cribriform plate of the ethmoid or roof of the sphenoidal sinus to the brain, or death may result from sepsis and exhaustion.

The objective appearances of sarcoma are not altogether characteristic. It is usually pedunculated, but may be sessile, and arises most often from the cartilaginous and bony septum and the middle turbinated body, but it has been seen originating from any and all parts of the nose. The color varies from that of a simple mucous polyp to a yellowish-pink or dark red, most often the latter. It is ordinarily quite soft to the touch of the probe and bleeds easily on examination, as in the rounded variety, or it may be quite firm, as in the fibrosarcoma. The surface is smooth, unless ulceration has occurred. The tumor may have originated in any of the neighboring cavities, invading the nose secondarily. The writer, some ten years ago, had under his care a physician in whom a gliosarcoma of the dura mater perforated the base of the skull at the region of the sella turcica, invading the sphenoidal sinus, and causing softening and absorption of the cribriform plate of the ethmoid. The glands of the neck are not involved, unless it be by direct extension of the disease to them. Sarcoma is to be differentiated from simple mucous polyp, angioma, adenoma, carcinoma, and syphilis. The iodides should be administered to exclude syphilis in a doubtful case, and a microscopic examination of a piece of the tumor removed by the cold wire snare should always be made.

Prognosis depends upon the site of the origin of the tumor, the extent of its invasion, and the variety of the neoplasm. Sarcoma, having its origin in the septum, especially the cartilaginous part, offers the most favorable outlook, while one arising from the middle or superior meatus is most unfavorable. The round-celled sarcoma, the commonest variety seen in the nose, is also the

most virulent. More than fifty per cent. of all cases are fatal. Of one hundred and three cases in Harris' table, the final termination was stated in but fifty-five, and of the latter twenty-five ended in death and thirty in recovery. All but one of the thirty were operated upon. Twenty-two of these latter, however, were reported as cured within a year of operation, and it is probable that recurrence took place in some or many of them later.

Treatment.—Surgical intervention at present offers practically the only chance of recovery. The operation must be thorough and the tumor completely eradicated.

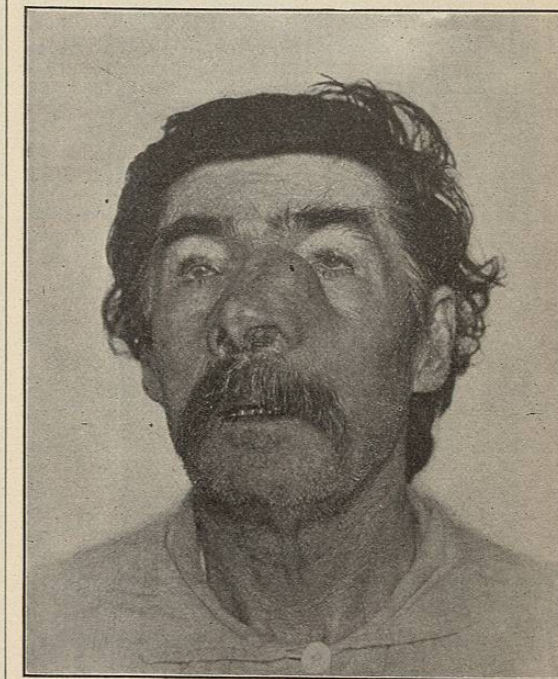


FIG. 3490.—Adenoma of the Nose, with incipient Sarcomatous Degeneration. (Case reported by Dr. Emil Mayer in *American Medicine*, August 2d, 1902.)

If the tumor is pedunculated and arises from the septum, especially at its anterior part, an intranasal operation with the snare may be entirely efficient; but if the growth comes from the middle or superior meatus or invades or involves the accessory sinuses or is inaccessible in any way, an external operation must be done. The nose is released and the parts involved are laid bare, the tumor is removed by cutting or the use of the snare, and the base is thoroughly curetted. Should recurrence take place, this should be removed at once. In inoperable cases—and many are inoperable—Coley's mixed toxins may be given with some hope of diminishing the size and retarding the development of the tumor, even if not curing it; such a course being specially indicated in the spindle-celled variety.

CARCINOMA, much more rarely seen in the nose than sarcoma, is always primary and occurs as epithelioma or cylinder-celled carcinoma. It originates most frequently from the cartilaginous septum and the turbinates, but more often still it is an extension into the nasal fosse from the neighboring accessory sinuses, especially the maxillary. It is found during or after middle life, differing in this respect from sarcoma, which occurs at all ages. Unlike sarcoma, which has its origin in the deeper structures and forms a distinct tumor, epithelioma begins in the mucous membrane, ulcerating and destroying as it progresses. Nasal obstruction and pain of a neuralgic character are early symptoms. The discharge at first is acrid and of a sero-sanguinolent character, but as ulceration occurs the discharge is more profuse and be-

comes putrid and fetid, giving to the patient and his surroundings an odor that is persistent and offensive. Repeated attacks of epistaxis occur. Tinnitus and impaired hearing and earache are often complained of. As the growth extends into the accessory sinuses, the orbital and cranial cavities, a new set of symptoms develops. The cheek becomes full, the eyeball is pushed out, vision may become impaired, pain is greatly increased, and finally signs of meningitis or brain abscess develop.

Objectively, epithelioma presents itself early in the disease as an infiltration of the mucous membrane, suggesting a papillomatous hypertrophy, but ulceration soon takes place, leaving the edges of the ulcer hard and the surface angry and covered with a thick, grayish secretion. Bleeding follows the slightest probing. The tumor shows marked tendency to invade the deeper parts, with little inclination to extend outward to the skin. Sooner or later the submaxillary and cervical glands become involved, though this is not always so, and cachexia develops only after the disease has existed for some time. The differential diagnosis is to be made usually from syphilis, lupus, and tuberculosis. Antisyphilitic treatment will often clear up a suspected epithelioma, and when any doubt exists the iodides should be given, if but for diagnostic purposes. Lupus has a very marked tendency to extend to the skin, which is usually involved. In a case of suspected primary tuberculosis, the bacillus will be found if that disease is present. The microscope may be required to determine the diagnosis of epithelioma; in employing it, however, one must not overlook the possibility that the removal of a piece of the tumor may be followed by renewed activity of the growth.

The prognosis is absolutely bad, few if any authentic cases of recovery having been reported. The disease appears to be more rapidly fatal in the nose than in most other parts of the body. Treatment heretofore has been unavailing; operation seemingly not only not eradicating the disease, but not affording even temporary relief. The growth recurs rapidly. While the x-ray as a curative or remedial agent in the treatment of cancer is still experimental, yet the very favorable reports of its use in other parts of the body would make it seem that the patient should be given whatever benefit there may be in this treatment. Pain may be relieved somewhat by orthoform or other local anesthetic, and toward the end narcotics should be given to relieve the sufferer, and antiseptic washes used locally throughout the disease.

Thomas H. Halsted.

NASAL CAVITIES, DISEASES OF: PARASITES.—

The presence of animal parasites within the nasal cavities is of relatively infrequent occurrence. In the majority of cases such an event is purely accidental; true parasitic infection—i.e., the presence of animal forms which reproduce, or pass one or more stages of their existence, within the nose—is very rare. As is the case with the external auditory canal, the nasal orifices, under certain conditions, may form favorable avenues of entrance for such creeping forms of animal life as are fond of escaping the light by crawling into dark places. The residence of such animals within the nose is usually but temporary; during this time they do not draw nourishment from the body tissues. The effects produced are chiefly those of local irritation or obstruction. To this condition the term pseudoparasitism may with propriety be applied.

PSEUDOPARASITISM.—Among such pseudoparasites of the nasal cavities may be mentioned earwigs, centipedes, numerous beetles, insects, spiders, mites, bedbugs, leeches, and worms. Entrance into the nose is usually obtained during sleep, very often in the open air, during the daytime. The local symptoms of irritation and obstruction may be very slight or severe. Bloody or mucopurulent discharges may be produced. In many cases the chief symptoms are of a nervous character, due to fright or worry. The intruder may penetrate into the frontal sinuses. Such cases may be attended by dangerous symptoms or even result fatally. It is said that cen-

tipedes are especially likely to reach the frontal sinuses. Cases are reported of these animals remaining in the frontal sinus for years, drawing their nourishment from the secretions of the cavities.

The occasional entrance of round worms (*Ascaris lumbricoides*) into the upper air passages and into the nasal cavities is of clinical importance. As is well known, these worms may, during the sleep of the affected individual, wander from the intestine, through the stomach and œsophagus, into the mouth and upper air passages. Ordinarily no especial symptoms are produced, but the passage of the worm into the larynx may cause serious symptoms of suffocation or even result fatally. Important obstructive symptoms may also arise from the penetration of the worm into the Eustachian tube or tear duct.

The *Oxyuris vermicularis* may be transferred from the anus to the nose through uncleanly habits, but does not remain in the new location.

TRUE PARASITES.—**Protozoa.**—Various forms of protozoa (*Amœba*, *Cercomonas*, and *Trichomonas*) have been reported as occurring in the nose, in such conditions as ozœna, purulent catarrh, whooping-cough, noma, etc. It is very doubtful if any of the appearances, described in the majority of such cases, were really protozoa; it is much more likely that they represented degenerating cells, leucocytes, etc. More careful observations are needed to settle this point.

Worms.—The accidental presence in the nose of *Ascaris* and *Oxyuris* has already been mentioned. I have been unable to find in the literature any well-authenticated case of *Cysticercus* of the nasal cavities. Only two or three cases of nasal *Echinococcus* have been reported. In one of these, observed by Rogers, the patient, a woman aged thirty-four years, had had a severe nasal obstruction for two and a half years. During a violent effort to clear the nose there was an escape of a large quantity of clear, straw-colored fluid. Two months later a cyst-like body was removed by snare from the middle turbinate; this was ruptured during removal. The microscopical examination showed the presence of numerous echinococcus hooklets in the walls of the cyst.

Arachnida.—*Pentastoma denticulatum*, the larval form of *Pentastoma tenoïdes*, is found in the nasal, frontal, and maxillary sinuses of various animals, particularly in the dog. Rarely, the parasite may be found in the human nose; the infection usually takes place from dogs, or through the accidental inhalation of the young larvæ, or by the eating of contaminated food. In the latter case the parasite later wanders from the alimentary tract into the nasal cavity. Its presence there causes inflammation, nosebleed, etc. The diagnosis rests upon the occurrence of severe irritation, and the demonstration of the parasite.

Insects.—The most common and important nasal parasite belonging to this class is the maggot or larva of certain flies, both of the biting and the stinging varieties. The fly lays its eggs upon either the normal or diseased mucous membrane of the nose; in the latter case probably attracted by the odor of secretions. Certain varieties may force their way into the healthy nose and there deposit their eggs. Such an infection occurs, in the great majority of cases, when the affected individual falls asleep in the open air during the daytime. The *Sarcophaga carnaria*, *Sarcophaga Wohlfahrtii*, *Musca anthropophaga*, *Musca cadaverina*, *Musca domestica*, *Musca stabulans*, *Piophilæ casei*, *Lucilia macellaria*, *Cestrus bovis*, etc., have been reported as producing maggots within the human nose. In certain tropical countries, Mexico, Central America, the tropical portions of South America, West Indies, Hindustan, etc., such infections are not uncommon. The condition is known as *Myiasis narivum*. In the great majority of cases the affected individuals have a history of ozœna or purulent nasal catarrh. The *Lucilia macellaria*, however, frequently attacks the healthy nose.

The symptoms of myiasis are usually very severe; it is said that the sufferings may be so intense as to lead to suicide. The number of eggs laid upon the nasal mucosa

may be very great, as many as five hundred eggs of *Lucilia macellaria* (Texas screw-worm) having been removed at one time. In other cases several hundred larvæ may be removed or discharged. The eggs hatch rapidly, and nasal obstruction soon results, with intense pain in forehead, cheeks, etc. A watery or bloody discharge, œdema of the neck and face, vertigo, sleeplessness, delirium, coma, reflex vomiting, and convulsions mark the affection. Fever may or may not be present. The nasal mucosa may be completely destroyed and the bones denuded through the efforts of the growing larvæ to obtain nourishment. Within a short time, one to two weeks, the larvæ leave the nose to form their cocoons outside. The character of the nasal discharges usually changes after the maggots have left the nose, becoming more purulent. The inflammation may persist for a long time, or in other cases the symptoms may abate immediately upon the removal of the parasites.

The history of the case, the symptoms of rapid obstruction with watery or bloody discharge, and the demonstration of the presence of the maggot make the diagnosis clear. The prognosis is on the whole favorable, but fatal cases may occur.

The treatment of nasal parasites in general consists, first, in the removal of the parasite; secondly, in the treatment of the local condition caused by its presence. In the case of maggots or other parasites which are more or less firmly attached to the mucosa, various antiseptics may be used for the purpose of stupefying or killing the parasite. Inhalation of chloroform, ether, turpentine, bichloride solutions, calomel powder, decoctions of tobacco, balsam of Peru, are among the remedies suggested. The filling of the nasal cavities with warm glymol is advised, especially in the case of maggots; the oil filling up the spiracles of the larvæ kills them, and they are then easily washed out. In very rare cases it may be found necessary to explore the frontal sinus.

Alfred Scott Warthin.

NASAL CAVITIES, DISEASES OF: RHINOSCLEROMA.

—On account of the wide diffusion of the lesions it has been suggested to substitute the name scleroma, without a local qualification, for this affection. It is a rare disease which is seldom found excepting in Austria, Hungary, and Italy. It is characterized by a peculiar connective-tissue growth in the mucous and submucous tissues of the respiratory tract which forms nodes, tuberosities, or slightly raised, smooth, flat, and extremely hard patches. In course of time these are seen about the nostrils or upper lip, and finally they invade any and every portion of the respiratory tract. These new growths are of a cartilaginous hardness, and owing to the atrophy of the new tissue, they form dense cicatrices without the intervention of ulceration.

ANATOMICAL CHARACTERISTICS AND COURSE OF THE DISEASE.—Hard prominences, varying usually in size from a millet seed to a pea, and diffuse infiltrations characterize the disease. The affection usually begins in the salpingo-palatal fold or in the choana, and gradually progresses forward until the vestibule of the nose is reached, where it may terminate, or it may involve the external integument, occasionally invading the upper lip and changing it into a hard, snout-like protuberance. It also extends downward involving the pharynx, larynx, trachea, and bronchial tubes which become constricted by the contracting cicatrices. The diffuse infiltrations are firm and very rigid, and in proportion to their size mechanically obstruct the nares. Later, they undergo cicatricial transformation, and further obstruct or completely obliterate the nasal passages by the contraction of the resulting scars. When the cartilaginous external nose is involved in the disease, it becomes deformed by nodular protuberances of intense hardness. The integument of the nose is at first dense and white; later it reddens or acquires a livid hue. Occasionally slight ulceration occurs and fissures sometimes form, especially between the alæ and the cheek. In the nasal vestibule the disease often forms voluminous folds, which may

protrude from the nostril. These are of a bluish-red color and are sometimes a centimetre in thickness.

ETIOLOGY.—Among those who have given this affection the most study it is generally believed to result from the presence of the Frisch bacterium, which is always

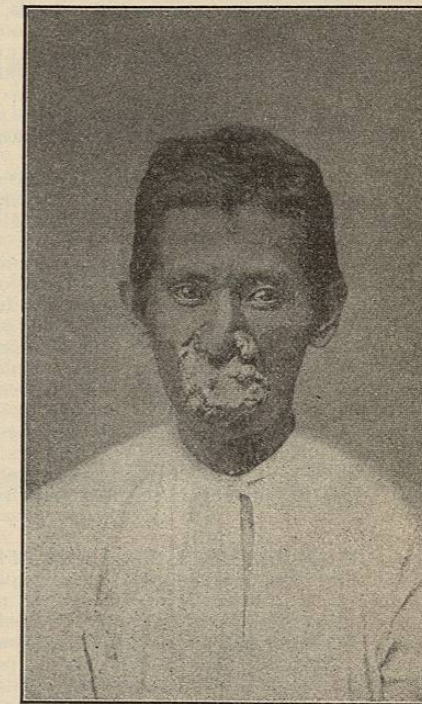


Fig. 3491.—Rhinoscleroma. (From Le Dentu et Delbet's "Traité de Chirurgie.")

found in considerable numbers in the cells in the lymphatic spaces of the affected part. There is no proof that it is contagious.

SYMPTOMATOLOGY.—In the beginning the disease is marked by symptoms of simple chronic rhinitis, which may extend over a period of several years. The secretion, at first watery, gradually becomes purulent. Afterward it dries into scabs or crusts, which as they decompose emit a very offensive odor, different from that of ordinary ozœna and apparently peculiar to rhinoscleroma. The scleromatous tissue is not usually deposited until the catarrhal symptoms have existed for several years. On account of the painlessness of the disease and its gradual accession, patients commonly do not present themselves for treatment until a number of years after its beginning.

DIAGNOSIS.—Rhinoscleroma is to be distinguished from syphilis, epithelioma, and keloid, though as the latter is distinctly a disease of the skin which often appears in old cicatrices, it is not at all likely to be confounded with rhinoscleroma. The essential features in the diagnosis are the chronic course of the disease, the cartilaginous hardness of the infiltration, the formation of cicatrices without previous ulceration, the invasion—during the latter portion of the disease—of the larynx, trachea, or pharynx, and the broadening and deformity of the external nose by the scleromatous deposit.

Syphilis in the tertiary stage also leads to cicatrices which might be mistaken for those of rhinoscleroma, but syphilitic lesions differ from those of the disease under consideration in that their progress is more rapid and the hardness of the gummy deposits less marked. The syphilitic nodule also commonly ulcerates, whereas the scleromatous one does not. Again, the specific treatment of syphilis is usually followed by speedy improvement,