states of the uterus, and I think we may legitimately infer that the abnormal condition was entirely of a reflex nature—an origin leaving little to imagination, when one considers the intimate nervous relations which exist between the uterus and abdominal muscles in the lumbar plexus.

To account for the cause of the other signs of pregnancy in any more lucid manner than by generally attributing them to nervous influences is hopeless; details are a mystery. But if, as is well known, sudden nervous impressions are sufficient to inhibit the secretion of milk, there seems no reason why other nervous impressions may not react in an opposite manner.

An example in the lower animals under my own observation illustrates, in a marked manner, the influence of will in promoting the lacteal secretion. A Dandie Dinmont bitch has had pups three times, the last litter five years ago; since that time, however, she has successfully nursed three litters of Highland terrier puppies, which she appropriated at the earliest opportunity after severe conflicts with the real mother, a weaker dog. Other cases such as this have been recorded by Harvey.¹

The subject as a whole, though highly interesting and curious from a scientific point of view, demands from a practical standpoint special attention.

No more damaging error of diagnosis can be made than that regarding pregnancy, and none more certain to be revealed, and I might almost say, proclaimed from the housetops. Therefore these cases, though scant, must be of value in teaching how necessary it is to refrain from assenting to a diagnosis of pregnancy, without having satisfied ourselves of at least one *absolute* sign.

THE TREATMENT OF INFLAMMATION OF THE EUSTACHIAN TUBES.

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THE great clinical importance of the inflammatory diseases of the Eustachian tube may, perhaps, be best summarized by stating that all ear diseases, not dependent on causes acting from without through the external auditory canal, are dependent on Eustachian lesions. When the enormous frequency of middle-ear affections is considered, it will be

¹ Generation of Animals, p. 540.

admitted that few subjects could be of more interest, not only to the aurist, but to the general practitioner as well.

Simple acute Eustachian salpingitis is a frequent sequel of acute nasopharyngitis of various types, notably of true acute coryza and the several phases of acute rhinitis associated with scarlet fever, measles, etc. It may exist as an active hyperæmia only, or may go on to deep-seated infiltration and serious inflammation. The phenomena are those of inflammation of any mucous membrane; there is swelling of the mucosa and increased secretion, the exudate containing numerous ciliated epithelial cells. The mucus may be so thick and adhesive as to project from the pharyngeal orifice as a bulla, the masses being of jelly-like consistency and often of considerable size. The gland follicles are also engorged and enlarged, giving a granular appearance to the tubal lips.

The symptoms of acute tubal catarrh are pain, either of an indefinite, dull, heavy character or, in severe cases, the characteristic *boring* pain of "earache," autophony, deafness, and tinnitus aurium. Examination with the rhinoscope shows engorgement, sometimes closure of the Eustachian opening, and in the later stages of severe cases the mucous exudate above described. The nasal mucous membrane shows the "wet-brick" congestion of acute rhinitis, with the usual swelling and occlusion, rapidly disappearing under applications of cocaine. The pharynx shows engorgement of the tonsillar regions in most cases. Inspection of the membrana tympani may or may not demonstrate retraction, with more or less injection of the manubrial plexus of bloodvessels.

The prognosis is complete return to normality under proper treatment, but if the disease is left to run its course some permanent impairment of hearing almost certainly results.

*True croupous inflammation*¹ of the tube occurs as a complication of pharyngeal diphtheria, usually in fatal cases, the symptoms being those of simple inflammation much exaggerated.

Chronic Eustachian salpingitis is the most common ear disease occurring in the eastern United States, from one-half to three-fourths of the aural cases applying at our clinics, or for private treatment, being sufferers from some stage of this affection. The pathological lesions are persistent hyperæmia and infiltration, with enlargement of the glands and thickening of the sub-mucous connective tissue, from fibro-blastic organization of leucocytes. This may be so extensive that the hypertrophied mucous membrane is thrown into folds and wrinkles at the Eustachian orifice—a most important fact to remember when using the Eustachian catheter in these cases.

The symptoms of this condition are progressive deafness, distressing tinnitus aurium, occasional autophony when the tubes contain mucus,

¹ Wendt: Archiv. der Heilkunde, xi. S. 261.

and, under the same conditions, squashing and bubbling sounds in the ear. Although noted in few if any text-books, dull pain, throbbing, and a sense of tension and distention in the ear are among the first and commonest symptoms of this disease. Vertigo, headache and neuralgia are frequent, and phenomena caused by the naso-pharyngitis are prominent. By the rhinoscopic mirror the tubal prominences are found to be swollen, dark-red in color, and the openings are often occluded by tenacious mucus or hypertrophied mucous membrane. Large, prominent veins, similar to those so frequently seen on the pharyngeal wall and epiglottis in long-standing pharyngo-laryngitis, traverse the tubal lips. The nares show advanced rhinitis, and the pharynx gross nodular changes bearing a direct causal relation to the nasal and aural lesions, as I have previously shown.¹ Examination with the ear speculum and mirror (always far less instructive than inspection of the Eustachian region) shows varying degrees of opacity and retraction of the drum, very frequently associated with vasomotor disturbances of the lining of the external canal, cerumen impactions, eczema, etc.

In patients in whom the catarrhal diathesis is prominently present, usually as an inherited condition, chronic Eustachian salpingitis tends inevitably to progress into true aural sclerosis. The causes are a condition of bloodvessel malnutrition, occasionally associated with gout, syphilis, or tuberculosis, but far oftener seeming to depend on the action of some constitutional poison, as diphtheria, or on some obscure central vasomotor influence.

The symptoms, when advanced cirrhotic changes have occurred, are not obstructive; frequently, on the contrary, the Eustachian channels are widely patulous. Progressive deafness, severe tinnitus, and, as in cirrhosis of other organs—the kidney, etc.—a proneness to acute exacerbations, are characteristic symptoms. The tubal prominences are atrophied, shrunken, yellowish-gray in color, their openings plainly visible; and the use of the Eustachian catheter demonstrates the tube to be too freely open throughout its length. The general post-nasal mucous membrane is papillomatous,² fibrous, and anæmic; secretion is usually scanty, with an inclination to form thin, scaly crusts. The respiratory mucous membrane, from the anterior nares to the capillary bronchi, shows inflammation and induration, and the skin, digestive tract, and heart demonstrate the “catarrhal diathesis.”

The tympanic membranes show hickening, retraction to “jamming,” adhesions, and newly-formed fibrous tissue bands, the function of the drum being often completely destroyed; the tubal muscles also undergo fatty degeneration and atrophy, so complicating and adding to the vicious circle of pathological processes.

¹ The Medical News, October 22, 1887.

² See THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, February, 1889.

The prognosis of simple chronic Eustachian inflammation under careful management is excellent, great relief and occasionally cure resulting. In true aural sclerosis, however, the outlook is extremely grave; without treatment or climatic change, total loss of hearing seems the only alternative; and misdirected therapeutics, and preëminently meddlesome operative surgery, assures speedy and hopeless deafness. Fortunately, however, by the use of proper means, if the patient can be controlled, the disease can be arrested in most cases, and in some instances a slight degree of improvement secured.

A third type of Eustachian disease deserves special consideration. *Septic* tubal inflammation, the Eustachian lesion of purulent otitis, precedes and accompanies all cases of middle-ear suppuration, and may be found in examples of purulent rhinitis where the tympanum has as yet escaped infection. The cause is the entrance of pathogenic bacteria or their ptomaines into the ear-tube; it occurs, therefore, with all types of septic naso-pharyngitis, preëminently in scarlatina, typhoid, diphtheria, and measles.

The symptoms are usually marked and distressing, being those of simple acute inflammation much exaggerated; if the tympanum is invaded, agonizing pain, delirium, and even coma may ensue, the temperature frequently reaching 105°. On examination the post-nasal mucous membrane will be found intensely gorged, oedematous, and dark-purple in color; erosions extending to shallow ulcers, from the death and shedding of epithelia, are also characteristic lesions. The tubal opening is usually not visible, and patches of semi-adherent pus stick to the Eustachian prominences and the general mucous membrane. I have frequently seen glairy muco-pus oozing from the tube in an adherent string, illustrating the bad surgery of using Politzer's inflation—as usually employed—in these cases. Inspection by the external canal may show any phase of destructive otitis, and perforations of the drum are the rule.

The affection is always a serious one, always threatening both hearing and life; the first by invasion of the tympanum, the second by extension to the mastoid cells and the meninges. General septicæmia, with its dangers, is also far more common in cases of purulent otitis, the writer believes, than is taught in most otological works.

The treatment of Eustachian salpingitis varies widely, according to the variety and the stage of the disease. The simple acute type reacts exceedingly well to properly directed therapeutics. The indications are: first to control the coryza by means of cocaine muriate, delicate antiseptic and sedative spray applications, and the use of a sedative powder, containing bismuth, morphine, and atropine; or, as I frequently employ, a spray application of menthol, camphor, and eucalyptol, in minute proportions, dissolved in *albolene*, or a similar bland oil. In severe cases

where discomfort is great, atropine and sodium bromide, given by the mouth, seem to exert a strong controlling influence. The pharynx should receive soothing treatment, and laryngeal or bronchial complications careful attention. Symptoms referable to the middle ear, unless pain is a prominent feature, are far less important, as they will disappear as soon as the salpingitis is controlled, and all meddling surgery directed to the drum membrane through the auditory canal is so unscientific and useless as, perhaps, to deserve the name of an anachronism—belonging as such procedures do to the dark ages of otology. Politzer's or catheter inflation may be called for in the later stages of the disease, and direct tubal applications by means of the *syringe-catheter* are indicated, should hyperæmia and hypersecretion persist.

If the inflammatory process tends to continue and become subacute in character, sprays of the distillate of hamamelis, properly diluted, or of the sulpho-carbolate or iodide of zinc, used preferably in the post-nasal atomizer, act very well. Patients can usually be dismissed cured in from one week to one month of treatment.

Croupous inflammation of the tubes and naso-pharynx demands the approved antiseptic treatment of diphtheria, but when the disease is so extensive is seldom successful; the urgency of the laryngeal and constitutional symptoms generally far outweighing and masking the aural sequelæ.

Chronic Eustachian catarrh was, up to a very recent date, one of the opprobria of the profession; the prognosis under the dallying, unscientific treatment in vogue a few years ago, as to relief, being *nil*. But at the present time, improvement can be promised to all but aged or hopelessly delicate patients, and a cure can be obtained in most early cases. The naso-laryngeal tract must first be brought as near a condition of normality as its lesions and the state of our knowledge permit. Especially must all nasal obstructions be removed, the great danger of even a moderate degree of stenosis having been incontrovertibly proved by Pomeroy¹ and others. Usually this can be accomplished by the use of well-chosen sprays, of chromic acid used by Bosworth's method, or by the very cautious and conservative employment of the galvano-cautery; in very rare cases only the septal knife, saw, or gouge, and the nasal snare may be needed. But (*physiologically*) free respiration through both nostrils is absolutely essential to permanent improvement.

The faradic current applied directly to the turbinated bodies, the Eustachian prominences and the pharynx, by means of the nasal electrode, and applications to the tubal lining by means of the syringe or ordinary catheter (only the mildest solutions in bland oil being admissible in the latter instance) are of great value. Of course, inflation, drum massage,

¹ The Medical Record, February 18, 1888.

and other of the well-known therapeutic methods must be directed to the tympanic membrane and chain of ossicles to secure improvement in hearing. Internally and constitutionally the bloodvessel tonics are of the first importance, and careful regulation of the habits of life is essential.

In cases of true sclerosis, applications of stimulants to the naso-pharynx and Eustachian passages are of far more value than is generally supposed; galanga, iodine, eucalyptus, thymol, and myrrh, are valuable in the order named, and the approved treatment of sclerotic rhinitis and pharyngitis must be carried out in fullest detail. Constitutional remedies are to be directed to the diathesis, and a large share of fresh air and exercise, accurately regulated, must, if possible, be secured. The methods advocated in earlier stages of the disease should be carefully carried out, often over periods of a year or more, and the patient must remain under permanent supervision.

The procedures through the outer canal, at the command of modern aurists, are almost too numerous to mention; but very many highly-lauded operations are, in the writer's opinion, not of permanent benefit, but of inevitable injury. An invariable rule should be that no fresh migration of leucocytes should be caused—their tendency to form fresh connective tissue being the pathological essential of the disease. The *rationale* of scientific treatment is to so "stimulate" the blood and nerve-supply as to prevent the hyperplasia and contraction of connective tissue elements, and to control inflammation and the migration of fibro-blasts.

Two operations are at the present time very fashionable in aural sclerosis: *mobilization of the stapes*, lately brought forward as new,¹ but frequently performed, lectured upon, and reported² by me more than three years ago under the name of *drum-stretching*, and considered on theoretical and anatomical grounds years before by Kessel and Politzer, is perhaps the most valuable practical operation in these cases. But its effects last but a few months at most, and it cannot yet be decided whether, from its frequent repetition, the patient receives permanent benefit or the reverse. Done with extreme care there is no inflammatory reaction, and but trifling risk; the operation consists in making a free incision in the posterior segment of the drum; a hoe-like instrument of great delicacy is then introduced through the cut, and cautious traction made on the handle of the malleus, or the incudo-stapedial joint, or both, so "stretching" and possibly breaking up adhesions. In nearly all cases there is at least temporary improvement in hearing, and—as is the case with almost every operation upon the ear (as upon epileptics) temporary "cure" of the tinnitus aurium.

The second fashionable operation, recently brought into much promi-

¹ Annales des Maladies de l'Oreille, November, 1889.

² The Polyclinic, September, 1887, p. 89.

nence, but not new, is *excision of the drum-head* with the malleus and [occasionally] the incus; the procedure is naturally a far grosser one than stretching, and exceedingly liable to be followed by reactive inflammation. This operation, possibly of great value in purulent attic disease with necrosis of the ossicles, the writer cannot consider rational in cases of aural sclerosis, for the following reasons:

1. The operation always causes fresh migration of small cells, whose persistent tendency is to organization with subsequent contraction, equalling increase in deafness.

2. The method (in many cases) permanently robs the delicate tympanum of its protective covering, the drum, and all aurists are aware that the results of a persistent perforation are cirrhosis and impairment of audition: the primary physiological purpose of the membrana tympani being protective, any permanent opening is harmful to the ultimate condition of the organ. As so ably shown by Richey, of Washington,¹ "The tendency of the membrane to heal is an effort on the part of Nature to preserve the function of hearing from the effects of disease, or ill-advised surgical interference."

3. The manipulation is always painful, requiring general anæsthesia, and always has an element of danger—actually resulting in not a few instances—viz., acute purulent otitis, with its perils to hearing.

To summarize briefly, it may be said that the operation of excision—of admitted value in some cases of necrosis—offers not a single advantage over that of mobilization in aural sclerosis, but is, on the contrary, dangerous. Politzer's section of the posterior fold of the membrana tympani will often secure (and has done so in my hands) all the results in diminishing tension and tinnitus which have been reported as resulting from excision, and has the immense advantage of being safe, and almost without proneness to set up acute changes. Yet its distinguished inventor does not claim that the results are permanent.

The technique upon which I have most relied during the last three years for the control of distressing tinnitus after routine measures have failed, consists in *freezing the mastoid region* over the branches of the posterior auricular and stylo-mastoid arteries by means of a rhigolene or ether spray. The skin is frozen white over the entire mastoid area—of course with proper caution—at intervals of from one to six weeks, for an indefinite period; the results being almost invariably good, and "cure" of the tinnitus in a certain proportion of cases. The method was publicly used and lectured upon by me to the Polyclinic class in the fall of 1887, and has since been used continuously with increasing confidence. The exact explanation of the result is somewhat doubtful; the well-known vasomotor effect of freezing methods are, however, well known, and it is doubtless by means of the nerve influence, acting through

¹ Transactions American Otological Society, 1880.

the stylo-mastoid artery—which supplies the tympanum, mastoid cells, and semi-circular canals—that the method acts favorably. It is also well known that surface freezing lessens the conductivity of nerves, and profoundly affects nerve centres.¹

The therapeutic management of purulent Eustachian salpingitis does not differ widely from that proper in cases of simple acute catarrhal inflammation, but the spray selected should be decidedly antiseptic, as well as sedative, in character, and the drum and middle ear demand the most thorough attention and treatment. Inflation should not be used unless the lower portion of the tube can be first cleared, and injections of fluids into the tympanum through the Eustachian passages have been found to be rarely valuable. Tonics are always called for, and complications will need special attention. Thorough treatment of the naso-larynx, antiseptic irrigation through the external canal, and the proper use of boric-acid powders, will cure all cases where neither a profound cachexia nor dead bone exists, the latter being causative of the luxuriant growth of granulation tissue so troublesome in many cases of this type.

In conclusion, it has been the experience of all aurists that in no region of the body are meddlesome therapeutics so ill borne as by the Eustachian tubes, and all methods must be carried out with the most cautious, painstaking conservatism, to insure good results, in all phases of Eustachian salpingitis.

49 N. SEVENTEENTH STREET.

HÆMO-HYDRO-NEPHROSIS, DUE TO A SLIGHT INJURY; DRAINAGE; RECOVERY.

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R. W., aged fifty-four, came under my care at the General Hospital, April 27, 1889, with a large tumor occupying the front of the abdomen, on the right side. It extended upward nearly to the costal arch, downward to the brim of the pelvis, and nearly to the middle line, but did not present at all distinctly in the lumbar region. Palpation gave the impression of a very tense cyst; there was no resonance over the front of it, such as usually exists in renal tumors. The skin and subcutaneous tissues moved freely over the tumor, but the muscles were tightly stretched over it, giving the impression that the swelling might be intra-muscular. His *history* was as follows: About two years before admission the patient's wife, when getting into bed, slipped, and knelt on his right side with some force, causing very severe pain for a short time. Six months ago he noticed a swelling on this situation as large

¹ See Dr. S. Weir Mitchell, in *Medical News*, September 3, 1887.