

way as the alcohol does, by depressing the activity of the reacting mechanism.

Another important difference to be remembered in applying these results to the case of man is that of tolerance. The experiments were carried out after a few doses of alcohol had been administered and such doses were given in gradually increasing quantities. In man, however, there may be the same dose, roughly speaking, continued over a great number of years, in which case it is probable that a high degree of tolerance being induced no abnormal condition of the reacting mechanism is incurred.

In those cases in man in which alcohol does lower the resistance to infections it is probable that it acts in the same manner as it appears from these experiments to act in rabbits, by its action on the production of antibodies and not from any action directly upon the phagocytic activity of the white cells.

Conclusions.—1. Alcohol in small quantities has no action upon the phagocytic activity. 2. It has no action on the phagocytic activity until it is present in 12·5 per cent. strength. 3. Small quantities of alcohol injected into rabbits may stimulate the production of antibodies temporarily. 4. A large dose of alcohol lowers the opsonic index for 24 hours. 5. Continuous moderate doses of alcohol cause a permanent lowering of the opsonic index. 6. The reacting mechanism to vaccines is much less effective in alcoholised rabbits than in normal rabbits; the difference is still more marked when living micro-organisms are used.

SOME COMPLICATIONS AND DANGERS OF NASAL SURGERY.¹

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DURING the last 20 years nasal surgery has made very rapid advancement, the technique has much improved, and areas which at one time were deemed inaccessible and dangerous can now be reached with comparative safety, while the vulnerable parts of the ethmoidal labyrinth, for instance, have been more clearly defined. In recent years the attention of the medical profession has been drawn to the importance of surgical procedure in many of the cases previously treated—and very often unsuccessfully treated—by douches, snuffs, &c. Medical men, as a rule, did not hanker after such cases, which seldom did credit to their treatment; and often the patients, in a miserable condition from headache, foul nasal discharge, cough, and expectoration, &c., dispensed with medical advice, and either resigned themselves to their condition or gave themselves up, body and soul, to the remedies of the unscrupulous quack. Nowadays there are few diseases of the nose that we cannot in some way ameliorate, and there are many sufferers that we can reasonably promise to restore to perfect health. Naturally the increased number and the magnitude of nasal operations have produced complications and dangers unheard of in pre-operative days, and it is on these more particularly that I propose to dwell, completing the imperfect record of personal experience by cases which I have observed under the care of others.

DISEASES OF THE MIDDLE TURBINATE.

The middle turbinate, by far the most interesting and important of the spongy bones, is very commonly the site of disease of varying forms and intensity, and from its close proximity to the openings of the anterior group of sinuses it will be obvious to you that alterations in its size must materially influence the drainage of those sinuses. Fortunately, in many of the cases of acute inflammation of those sinuses the inflammatory products force a way out and recovery speedily follows, but occasionally—and I venture to say more commonly than we think—the sinuses only partially empty themselves, and one is face to face with the beginning of a chronic sinus suppuration.

Diseased conditions of the middle turbinate require its

partial or complete removal. It is said that fracture of the cribriform plate of the ethmoid has been caused by the use of the cold wire snare in this procedure. This I very much doubt, but I have seen post mortem a case where this structure showed a perforation supposed to have been caused by Walsham's scissors in removing the anterior end of the middle turbinate, death being due to suppurative meningitis. A point which I should like to strongly emphasise is the importance of having free access to the middle turbinate before attempting its removal. I refer to the correction of deviations and obstructing spurs, which not only occlude the view but very frequently conceal an enlargement and prevent its complete removal. If this is not done the mucous covering of these deviations is almost certain to be damaged and troublesome adhesions between the septum and turbinates are extremely likely to follow and will be very difficult to cure. The surgery of the nasal septum was until a few years ago in a most unsatisfactory state. The operations were manifold and the armamentarium employed was a most extensive one, and the results in many cases were deplorable. Adhesions to the turbinates were common, perforations and sloughing of the septum were frequent, and I know of a case where collapse of the tip of the nose occurred and transformed a well-shaped into an ugly snubnose. A few years ago Killian introduced his now famous operation of submucous resection of the septum, and I can unhesitatingly recommend it to you for practically all cases of septal deviation. Carefully and skilfully done it has no equal. It will afford easy access to the diseased middle turbinates, it will render any after-treatment simple, and it will make it possible for you to obey the golden rule for successful nasal surgery—namely, to have efficient drainage.

By far the most important disease of the middle turbinal region requiring surgical intervention is polypoid degeneration, commonly called nasal polypi, and there is no pathological condition in the nose which demands such careful, thorough, and patient treatment. Associated as it often is with suppuration and sinus infection, it will be at once apparent to you that it is a prolific source of the complications which occur in nasal surgery.

Ethmoidal curetting, the only operation worth doing for nasal polypi and apparently a dangerous procedure, is one which in skilled hands is attended with brilliant results. The dangers I shall enumerate to you, but only the most important will be reviewed at length. They are: (1) hæmorrhagic effusion into the eyelids and orbits; (2) orbital abscess; (3) necrosis of the frontal bone; (4) necrosis of the superior maxilla; (5) fracture, puncture, and laceration of the cribriform plate, suppurative meningitis; (6) suppurative meningitis apart from injury; (7) severe hæmorrhage; and (8) optic neuritis and blindness.

The first of these, effusion into the eyelids and orbit, is very common and of no moment. Orbital abscess, very rare, requires external incision, as do necrosis of the frontal bone and superior maxilla, but such unfortunate occurrences should not deter one from thoroughly clearing out the disease. To be timid with ethmoidal curetting will certainly deprive the operation of much of its success.

I had the good fortune to see a case which well illustrates all the complications I have discussed and a few more. Double ethmoidal curetting was performed on a woman rather over 30 years of age, who was the subject of old-standing nasal polypi and ethmoidal suppuration. A few hours later both eyes were closed with hæmorrhagic effusion, and, as is usually the case, she had severe frontal headache. At night the temperature was 101° F., being 99·5° in the morning. This febrile condition persisted, although at the end of the first week the effusion had left the eyelids, and the headache was merely a dull aching heaviness. Four days later puffiness appeared over the right nasal bone and the nasal process of the superior maxilla, and in a few days fluctuation was made out. The abscess was freely incised; a little thin pus escaped, and some necrosed bone was scraped away; it was drained. A week after, during which time the temperature had varied from 99° to 102°, a similar but larger swelling appeared along the lower orbital margin and was similarly treated. A week later just the same happened in the right frontal sinus region and subsequently on other parts of the skull. By this time the headache had become intense, optic neuritis was diagnosed, the eyelids were oedematous, and drowsiness had developed. At night she was delirious, and occasionally in

¹ Founded on an address delivered before the Nottingham Medico-Chirurgical Society.

the last two days of her life she had a rigor. The post-mortem examination revealed extensive necrosis of the superior maxilla and frontal bone scattered in small patches, and giving the skull a worm-eaten appearance. The cribriform plate was reduced to a soft pulpy mass, and the crista galli of the ethmoid floated free in the pus of a basal meningitis. All the accessory sinuses contained pus. The case, I think, is unique, and fortunately so. Its gradual progression to a fatal issue occupied about five weeks and nothing seemed to influence its course.

The cribriform plate of the ethmoid—that bugbear of most nasal surgeons in their early days—is occasionally punctured, fractured, or lacerated, and fear of this has time and again led to failure. But really a little care in watching the position of the cutting end of the curette with regard to the plane of the cribriform plate will prevent any damage. It is not so easily punctured as one would imagine—access to it is through a narrow slit, I might call it, and to get there requires some force. Still, the indiscriminate use of a cup-shaped curette with the cutting edge pointing upward will undoubtedly injure this structure, and it was in much this way that another death I have seen occurred. The instrument was a Grünwald's curved curette, and although the cutting edge was mostly directed towards the orbit, at times it must have strayed towards the vertical plane, and then the damage was done. I need not recount to you the further history of the case beyond telling you that acute suppurative meningitis reached a fatal termination in four days. The symptoms in such a case are similar to leptomeningitis from other septic causes but more severe. The diagnosis is never in doubt and the treatment is always in vain. Operation need not be thought of.

Before finishing this fragmentary description of the dangers of ethmoidal curetting a word of caution will not be out of place in dealing with older patients—those over 50 years of age—the subjects of long-standing sinus suppuration and polypi. Many of them have on frequent occasions had polypi removed; the middle turbinate, or what remains of it, is in a state of degeneration, and the tissues are of a pale bluish anæmic colour. The nose is full of pus, and perhaps all the sinuses are infected, and the bone destruction is usually much greater than one can diagnose by the speculum and probe.

A very interesting case—one that well exemplifies the risks of old-standing nasal polypi and suppuration in old people—was that of a man, 70 years old, who for 40 years had been the victim of nasal polypi. Time and again the polypi were removed by the snare, only to recur in a few months. Every visit to the surgeon he vowed would be his last, and he actually went for two years with his nose completely blocked. However, this state of things could not continue; his health began to decline, the pus which he was swallowing ruined his digestion, whilst cough and expectoration repeatedly spoilt his night's rest. He was obviously breaking up; headaches—occasionally frontal and sometimes occipital, but oftener general—still further reduced his strength. His spirits flagged, and at odd times he fell into a drowsy, half-somnolent condition. The headache increased and became so excruciating that he was compelled to seek advice, hoping that another clearance of his nasal passages would relieve him, as it had done before. This time, however, it was thought that the nasal condition would not account for the intensity of the headache, but in the hope that the removal of pressure and the improved drainage would allay the pain the larger polypi were removed under cocaine and adrenalin anæsthesia with the cold wire snare. There was no improvement; the operation had failed to benefit the headache. 12 days later he died, and the course of the illness was particularly interesting. He gradually became drowsy, his temperature at times reached 102° F., and his repeated request was for something to relieve the headache. He retained his faculties to the end, even talked and made witty remarks, and only for a couple of hours before death did he become quite unconscious. Throughout his pulse was strong; he had but one rigor and had no convulsions. Optic neuritis was absent. Twitching of the right arm and leg appeared for a day, and brief cycles of Cheyne-Stokes breathing were noted. Unfortunately no post-mortem examination was made, and thus the diagnosis was in doubt. Was it a cerebral abscess or suppurative meningitis? I am inclined to think it was the former from the previous history, from the duration of the illness after operation, and from the absence of signs of

meningitis save in regard to the temperature and drowsiness. Moreover, I might venture further and suggest that the abscess was in the frontal lobe. The cerebral abscess, if he had one, was probably old-standing, and its latent energy was stimulated by fresh absorption from the raw surfaces left after the removal of the polypi. Therefore I should like to impress upon you the importance of early and thorough treatment of nasal polypi and ethmoidal suppuration and to remind you of the complication which may ensue in old-standing cases.

THE SURGERY OF THE FRONTAL SINUS.

The surgery of this sinus has progressed with leaps and bounds since Ogston in 1884 described three cases of empyema which he had treated by operation. There is still room for great improvement, and I look forward to the time when one will be able unhesitatingly to recommend the radical operation without being haunted by fears of osteomyelitis of the skull and meningitis and the lesser evils of a discharging fistula in the orbit and continuance of the nasal suppuration. I would not have you think that I condemn the operation. Far from it, but I think many cases have hitherto been unwisely subjected to operation when the only symptoms of the trouble have been a discharge of pus from the infundibulum and an occasional headache.

To begin with, the deformity left after the radical treatment cannot be lightly laid aside. The disfigurement is obvious, and subjects of the double operation acquire a weird physiognomy, especially as the capacity of the two sinuses frequently varies. In women this is always a serious matter. Obliteration of the sinus, the common operation, is sometimes impracticable from its size. One has then to face the alternative of keeping a drainage-tube in the infundibulum till all discharge ceases. And this is no trifling matter if you consider that a rubber drain protruding at the inner angle of the orbit has to be worn for a considerable time, and then a silver cannula has to be inserted to prevent contraction of the infundibulum, and may have to be used for many months or even years. The uncertainty and tediousness of this mode of treatment try the patience of the surgeon and more so that of the patient, and some have drifted into a hopelessly neurotic condition, whilst others have become confirmed hypochondriacs. A hospital patient once told me that if the discharge from the orbital fistula could not be stopped he would commit suicide, and he looked as if he meant it.

The more serious and almost universally fatal complications of the radical operation are osteomyelitis of the skull, meningitis, and cerebral abscess, and to illustrate the first of these I will take the case of a young girl who was a sufferer from intense right frontal headaches and chronic nasal discharge. The operation was performed by Killian's method but no bridge of bone was left to preserve the contour of the orbit. A drainage-tube was passed into the infundibulum, and it was kept there for a week, till the skin incision had healed, and was then removed. The cavity was packed daily with gauze through this opening. Evidently the cavity was not being properly drained, for at the end of the first week the temperature rose to 102° F. and for the next few days ranged from 99° to 101·5°. The wound was opened up and one of the ramifications of the sinus was found shut off and full of pus. The gauze packing had not reached this point; otherwise the operation area looked healthy. The wound was opened up and free drainage was established, the gauze packing being continued. A few days later the skin over the frontal sinus assumed that glossy appearance which, to my mind, is a bad omen in such cases. At first there was no pitting on pressure, but a deep-seated tenderness led one to suspect bone inflammation. The wound was again opened up and the tissues were raised to expose a little of the frontal bone. This was found roughened and the periosteum over it was thickened; a drop of pus escaped on incising it. Perfect drainage was established but failed to influence the course of the bony inflammation. Oedema of the forehead with tender spots here and there over the skull were a fitting accompaniment to marked drowsiness, intense headache, and other evidence of septic infection of the meninges. Slowly she sank, and during the last two days of her life she was quite unconscious. She died about five weeks from the date of operation. Post-mortem examination revealed patchy osteomyelitis of the skull and purulent meningitis. Scattered all

over were small areas of necrosis from which beads of pus oozed on pressure.

No operative treatment seems to arrest the progress of osteomyelitis of the skull—and even the very radical proceeding of incising the scalp from ear to ear and chiselling away the outer table of the frontal bone failed to stop the spread in another case. In this case the drainage was apparently inadequate, and if one reflects on the irregularity of the boundaries of the frontal sinus, on its overhanging anterior surface perforated by venous channels, one can easily imagine that when the skin and tissues are allowed to fall into position how liable a small pocket is to be cut off. Once this happens time alone is necessary for it to become septic, for it seems well-nigh impossible to make the parts aseptic during operation. The subsequent course of the case is well illustrated by the examples I have already given you.

After such a gloomy account of frontal sinus surgery you will wonder why the operation is done, but when you consider that the posterior wall of the sinus is very thin, that erosion imperils the meninges, and that blockage of the fronto-nasal duct from oedema, nasal polypi, &c., is not uncommon, you will, I think, allow that the operation is absolutely necessary in some cases, and when I relate to you the following interesting case you will agree that disease of the frontal sinus involves the patient in considerable risk.

The case was related to me by a friend of mine, who was called in consultation to see a man who lay in bed apparently prostrate with grief at the death of a relative. Physicians said his mental equilibrium had been upset, probably from shock, and that restoration to health was but a question of time. Surgeons could find no symptom warranting an operation; in fact, they decided that the case was a medical one. He had no pain, no headache, and no optic neuritis. The appetite was poor and the bowels were constipated. He was listless and apathetic, would speak when spoken to, but at other times he lay with his eyes closed and seemed asleep. Someone mentioned "nasal discharge" and the rhinologist was soon on the spot. He detected signs of old ethmoiditis, but careful examination failed to justify any surgical interference. The patient died suddenly a week later, and nothing but increasing drowsiness was noted to help towards a diagnosis. Post-mortem examination revealed erosion of the posterior walls of both frontal sinuses with exposure of thickened dura mater and ethmoidal disease. A large abscess was found in one of the frontal lobes, and this had ruptured into the ventricles and caused the patient's sudden death.

To sum up the treatment of frontal sinus suppuration. In cases where pus escapes freely from the frontal sinus and is producing no ill-effect on the general health, and only an occasional headache is complained of, and if the patient can be seen periodically, I think the risks of operation more than counterbalance the advantages. Intra-nasal treatment will suffice for the patient's comfort. If, however, any signs of cerebral involvement occur, if the health is undoubtedly suffering from septic absorption, if the headache is intense and persistent, or the infundibulum is narrower and is causing retention, then an operation must be performed.

A few not unimportant sequelæ which one notices after operation, and which, although not of vital importance, are responsible for much discomfort to the patient, might be mentioned. Dryness of the throat and nose, sometimes with crust formation, may follow turbinal and extensive ethmoidal operations, and after the latter I have seen occur what one might term a post-operative ozæna. The risk of infection of healthy sinuses must not be lost sight of, and although this at times is unavoidable, still strict attention to the ordinary principles of antisepsis or asepsis will considerably reduce the risk. Acute inflammation of the middle ear and follicular tonsillitis as operative sequelæ need not be discussed, but before I finish there is one more interesting sequela that I wish to bring before you. It is the nervous breakdown which one occasionally encounters.

When considering the benefits that will accrue to the patient one must not forget that the removal of the diseased foci is not the only point at issue. One must satisfy oneself that the patient's confidence will stand the strain of perhaps a tedious and painful course of treatment, and one must be ready to banish all gloomy thoughts, to combat every evidence of flagging courage, and to make the patient feel

that both are successfully striving to produce an early and favourable termination to the trouble. Sometimes one fails; the patient breaks down and various aches and pains are complained of. They may be located in the head at one spot, or a general headache, or in the spine, or assert themselves as weakness in the limbs and joints. The female sex is not alone in the neurotic plight. A man of strong physique and of apparently well-balanced mind may give unmistakable signs of nervous collapse. Women suffer from painful and irregular menstruation and discover some tender spot in the ovarian region and hurry to the gynaecologist, whilst others adopt the suggestion of friends and undergo protracted rest cures, courses of electrical treatment, &c. Do not conclude that the operation has caused this train of symptoms: it is the tedious after-treatment which has been too much for their nervous systems.

Nottingham.

SOME NOTES OF A SEVERE CASE OF EXOPHTHALMIC GOITRE, IN WHICH TREATMENT BY X RAYS AND SOUR MILK APPEARED TO BE BENEFICIAL.

BY J. C. NEWMAN, M.B., B.C. CANTAB., F.R.C.S. ENG.

AN unmarried woman, aged 31 years, consulted me in September last year for shortness of breath, general weakness, and nervousness. There was evident exophthalmos, the thyroid gland was markedly enlarged, the pulse-rate was 120 per minute, and fine tremors of the fingers were demonstrable. The patient was well nourished and did not appear to be any thinner than when I had last seen her about six months before. The following is the result of further examination. The action of the heart was visible, rapid, and forcible. The apex beat was in the fifth interspace just internal to the nipple line. There was a systolic bruit over the base, but no murmur of valvular incompetency was diagnosed. I considered that the heart was somewhat, but not excessively, dilated. The arteries of the neck pulsated forcibly, and there was a loud "bruit de diable" heard over the thyroid gland. Exophthalmos was very marked. Stellwag's and Graefe's signs were present. The thyroid gland was enlarged, the left lobe being more so than the right. The whole gland was very sensitive to pressure.

The history of the illness is as follows. About ten months previously I had attended the patient for a "bilious attack" with diarrhoea and vomiting of unexplained origin. The attack passed off in two days. I noticed at the time a slight enlargement of the thyroid gland, but there were no exophthalmos and no unusual rapidity of the pulse, and the possibly true explanation of the attack did not occur to me. The mother has since told me that she was, then and after, anxious concerning her daughter's health, and that at about that time she noticed that she began to complain of the heat, although she had previously been a "chilly" person. She had no further symptoms, except occasional shortness of breath, for about six months, when she began to notice a feeling of weakness on exertion. This increased for three months, when she suddenly became very much worse, and was obliged to seek advice. In her past history there is nothing of importance, although before puberty she was considered delicate.

Her family history is interesting, and a scheme illustrative of it, so far as I have been able to trace it, is appended. Her father was more or less an invalid after the age of 39 years, when he had a "nervous breakdown." From this time he was liable to "totter as he walked" and at times he used to "shake a great deal." He developed "delusions" at 52. At 53 he had exophthalmic goitre, which terminated in acute mania and death at 55. The mother has had since girlhood a parenchymatous goitre. She has also suffered for many years from an "irritable colon"—i.e., the slightest indulgence in fruits, or even, at times, in green vegetables, will produce frequent large evacuations of undigested stools, accompanied by pain and much distress. She has been prostrated for weeks at a time from this cause. She is in other respects healthy. The family consists of two brothers,