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Operations for Mastoid Disease.

BY

SETH S. BISHOP, M.D.,

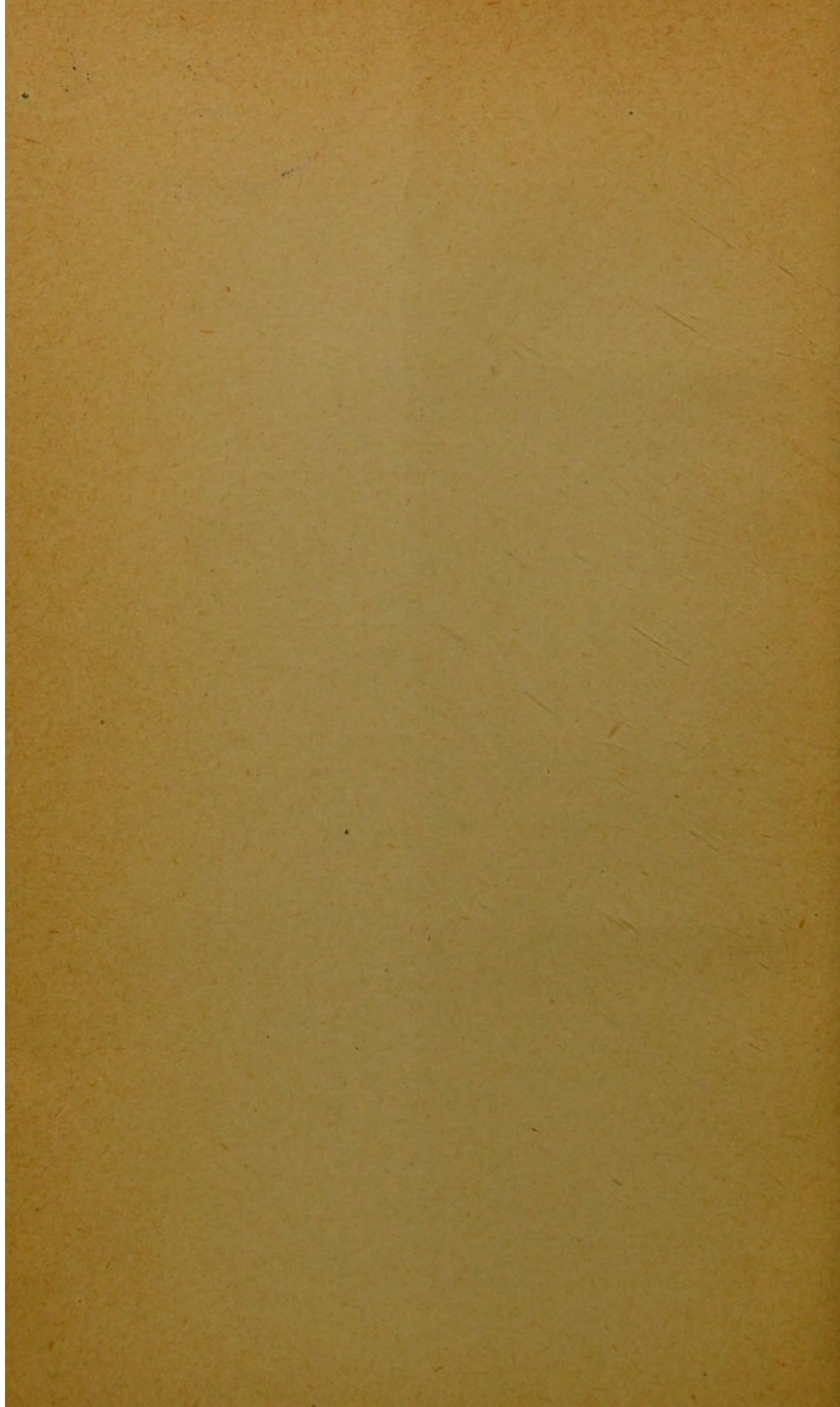
CHICAGO; SURGEON TO THE ILLINOIS CHARITABLE EYE AND EAR INFIRMARY, TO THE ILLINOIS MASONIC ORPHANS' HOME, ETC.

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OPERATIONS FOR MASTOID DISEASE.

The purpose of this paper is to increase your confidence in operations on the mastoid process. Some physicians, for whose attainments I hold the highest regard when matters of ordinary surgical experience are under consideration, have questioned the expedience of surgical interference in mastoid disease. Principles that are admitted to be unimpeachable in general practice, have been disputed when applied to the treatment of mastoid abscess and necrosis. No surgeon denies that free and early exit should be given to confined accumulations of pus, yet this correct surgical precept is not only neglected, but advised against by some of our excellent practitioners. Being fortunate enough to have had a very gratifying experience with several cases in which operations were imperative and successful, I desire to impress you, as I have been impressed, with the necessity, safety and success of these operative procedures.

A few words may be profitably devoted to the subject of

PREVENTION OF MASTOID PERIOSTITIS

and abscess. I have often dissipated an incipient inflammation of the periosteum by means of counter-irritation with cantharidal collodion or essential oil of mustard, applied generously over and below the mastoid process. I endeavor to produce as active irritation as possible without vesication, and for this purpose the mustard oil is superior, although its volatile quality renders it disagreeable to both patient and surgeon. I have had numerous cases in which these remedies were not applied until after pain, redness, swelling and tenderness were marked, and yet these irritants used once or twice a day for a few days caused the inflammation to subside, and

saved patients from the agonies of mastoid abscesses. Leeches, poultices and rest, with antiphlogistic remedies, will frequently effect the same result. But let us suppose that the opportunity for these measures is past, and that the formation of pus is inevitable, or that fluctuation is already present, what is the best course to pursue? What, but the same that we adopt in similar conditions in other parts of the body? A free

INCISION

with a strong knife should be made clean down to the bone, and from a half-inch to an inch and a half long. The cut should extend over the most prominent portion of the swelled mastoid tissue, directed from below upward, parallel to the attachment of the auricle. Should no pus escape immediately it will likely do so in a few hours, and we shall have dispelled the exquisite pain by relieving the stretched nerves of their unnatural tension. Free bleeding will probably occur from the divided posterior auricular artery, but this only depletes the over-distended vessels—adds water to the fire, oil to the burn. A grateful sense of relief comes soon, and we may confidently expect all the symptoms to be ameliorated. If no caries be present the wound should be cleansed, and dressed with finely powdered boracic acid, absorbent cotton and antiseptic gauze bandage, with a drainage tube or tent in the lower end of the wound.

So far we have dealt with a periostitis, or an abscess, in the course of which the disease has not invaded the bone. Although such cases are the concomitants of suppurative otitis media they are quite amenable to the preventive and curative treatment outlined above, associated with treatment directed against the middle ear disease, so long as the integrity of the bone is not affected. Let us now pass to the consideration of necrosis and the operations for

OPENING THE MASTOID CELLS.

After Wilde's incision has been made, as described above, the surface of the bone should be thoroughly explored with a firm probe to discover any caries or a sinus which might exist. If there is no more serious condition than superficial caries, this should be dislodged with the chisel, gouge or curette, care being taken to preserve all the periosteum. When dead bone is to be removed it becomes necessary to make a secondary incision, extending backward, at right angles to the middle of Wilde's incision in order to get sufficient space for the use of bone instruments. When a sinus is found I make the two incisions meet directly in the sinus, dissect up the periosteum and over-lying tissues, and have the flaps retracted and held out of the way by assistants. If the opening is a small one it should be enlarged with a small drill sufficiently to afford free drainage and to remove all the diseased bone. I have found the openings effected by nature in some cases too large and irregular to admit the use of either drill or trephine. In such cases the chisel, gouge and curette are required. Occasionally one may find spiculæ of bone loosened which he can remove with the ordinary dressing forceps, with a little careful manipulation to detach it from its irregular surroundings. When there is quite a large area of bone denuded of its periosteum we may find, on pressing the finger upon it, that it gives, as though it were hung on one side by a stiff steel spring. In such a case the line of demarkation between the healthy and diseased tissue should be sought, and the division be effected by the delicate chisel and mallet. A trephine may be useful also for this purpose if one can find a firm place for its fixation shaft. In using the chisel one should be sure that it is sharp and properly shaped, and that the blows of the mallet are light, otherwise more bone than we wish to remove may be taken. It has happened to me in a case where the necrosis was very extensive that the

whole lower portion of the process has given way under a dull chisel, carrying with it some healthy bone, and exposing the dura mater. The chisel was not properly tempered and beveled, and the cutting surface chipped during the operation. After all the superficial dead bone has been removed and the edges of the sinus rimmed out and made smooth by the conical drill, we may find the cellular tissue of the process diseased and filled with dark red, ugly looking granulations. The curette, adapted in size to the circumference and contour of the opening in the bone, should then be employed with the utmost caution to avoid injury to the dura mater, the lateral sinus, or the middle ear. Frequent stops should be made to examine the tissues we encroach upon and to determine when we reach sound parts. Small sponges used frequently will free the wound of blood so that we can make satisfactory examinations of our progress, and if the bleeding is considerable it is advisable to have an assistant syringe the cavity at every step with a warm solution of mercuric bichloride, 1-10,000, so that we shall make it impossible to remove tissues that should be left intact. In this way I have removed diseased bone until portions of the inner table were taken out, the dura mater exposed and the pulsations of the brain were visible, and yet have avoided harming the dura mater, as the subsequent progress of the case demonstrated.

In using the trephine or drill the instrument should be directed upward, forward and inward, as a rule; but the location of the sinus, if one be present, or the place selected for opening the bone, must help to determine the direction of the instrument. The pressure exerted on the drill or trephine should be very light, for fear that the outer layer may be unusually thin, and that the instrument may suddenly settle into the soft tissues beneath. The thickness of the outer layer will average from an eighth to a quarter of an inch. In children it is very thin; while in adults I have found it nearly a half-inch thick.

The operation ought not to be ended without syringing the wound, cleaning out all the debris and examining the cavity minutely by the aid of strong illumination made brilliant by the concave mirror if necessary. It requires the closest scrutiny to prevent the overlooking of small particles of diseased and dead tissue. Should we not be successful in removing all of this, the erosion may extend and require a subsequent operation. But the necessity of a repeated operation does not perforce argue that all the necrosed bone was not taken at a previous operation. I have several times removed diseased bone from a mastoid process which had been operated on before by a competent surgeon. At each operation the most critical inspection, under brilliant artificial illumination, has satisfied all the surgeons present that no unhealthy tissue remained. But this occurred in an extremely unpromising patient of a strumous diathesis, upon whom I operated to prevent meningitis and cerebral abscess. Nearly the whole mastoid process crumbled away, and some time after the third operation I found the incus lying loose in the wound.

It is remarkable how rapidly a suppurative inflammation of the middle ear may involve the mastoid cells in caries, and how extensive the necrosis may become after a few weeks' duration. I have seen cases that were discharging pus from a sinus which had existed for three weeks only, and where the advent of the sinus was preceded by no more than four or six weeks of suppuration of the middle ear, if the statements of patients and friends were to be credited. Upon enlarging the opening I have had to scrape away unhealthy granulations and dead cells with the curette, until the mastoid process was literally converted into an empty cup, before all the products of disease were removed.

If my observations are correct, the rapidity of this destructive process is greater in children than in adults. It follows, then, that it is better to operate

early, when the case requires it, to prevent extensive necrosis; and the vigor of youth renders the prognosis the more favorable.

It is a custom among some operators to leave the edges of the cut gaping, and to fill the cavity with lint, that it may heal from the bottom. I have preferred syringing the parts with the bichloride solution, dusting them freely with iodoform, inserting a drainage tube at the bottom of the wound, sewing it up and dressing it with absorbent cotton and a bandage of antiseptic gauze. With this treatment there is but little subsequent discharge. The case is seen daily and dressed as often as cleanliness and antiseptics require.

I have entered thus minutely into a description of this operation for the reason that it is rarely performed except by specialists, and although I have enjoyed the ample opportunities offered by the surgical clinics of New York, I never had the advantage of witnessing the operation until I first performed it. Yet I must say that the results in the first case were not surpassed by those in any other. The patient was a young man, 18 years old, with a discharging mastoid sinus accompanying a chronic suppuration of the middle ear. The caries was extensive and the hearing much impaired. I removed all the dead bone without sacrificing any of the periosteum, and followed a course of treatment adapted to the condition of the middle ear, with the result that in fifty-six days the wound had completely filled in and healed with hard cicatricial tissue, and the tympanic disease was cured. I met the patient on the street a short time since and he stated that he had experienced no further trouble, and that his hearing was as good as ever it was before the operation.

For the sake of brevity I will give but a skeleton sketch of one or two other cases. An interesting one is a boy 6 years old, who had scarlet fever, followed in two weeks by an acute suppurative inflammation of both middle ears. Two months later, when

I first saw him, a mastoid abscess had developed, necessitating Wilde's incision. Exploration with the probe revealed a sinus and softened, roughened bone. I was unable to obtain his parents' consent to an operation until three months later, when I operated at the Chicago Medical College. In the meantime I had succeeded in curing the suppurative process of the middle ears and had kept the sinus cleansed with solutions containing boracic acid, carbolic acid, mercuric bichloride, iodoform, the hydrogen peroxide, etc. Anæmia and malnutrition demanded tonics and alteratives, whereupon he grew fat and plethoric. At the operation it was found that a large part of the external layer of the process was denuded of periosteum, the bone was black and movable, and the cells were filled with very dark, unhealthy-looking granulations and pus. After removing all the diseased tissue the wound was dressed antiseptically, and in eighteen days had completely healed and the patient was well. Some weeks later, while the boy was at play with his companions, he received a blow over the cicatrix, which was followed by an acute inflammation and suppuration. A small spicula of healthy-looking bone, which the blow might have detached, protruded from the wound and was picked out. The wound then healed and opened several times, and when I last saw the patient there was a pin-hole opening and an oozing of a drop of sero-purulent discharge in the course of the twenty-four hours.¹

The only other case in which the results were not completely curative and satisfactory, was the one already mentioned as a bad case of scrofula. It was a woman in whom all the lymphatic glands were enlarged; she was emaciated, anæmic, without appetite or strength, and required the most invigorating and supportive treatment both before and after the operation. I should not have felt justified in operating were it not for the fact that the patient would likely

¹ This patient has made a complete recovery.

have died of exhaustion, pyæmia or cerebral abscess, if the extensive necrosed tissue were not removed and the suppuration stopped. She had been operated on five months previously, but the wound had never closed or ceased to suppurate. When she left the hospital the wound had not entirely closed, and there was a slight discharge, but no dead bone. She was permitted to go to the country on condition that she should return for treatment three times a week until cured. I never heard from her again.

These two are the only cases in which the cure might not be said to have been complete before they passed from under my observation, and during the past year I have had seven patients under my care in which the operation was imperative. Two of these cases were operated on by my colleague at the Illinois Charitable Eye and Ear Infirmary, Dr. F. C. Schaefer.

The arguments in favor of the operation may be summarized as follows: Three-fourths of the cases were completely cured. The remainder were benefited. None were worse for the operation. Nature's method of opening abscesses and casting off dead bone is slow and uncertain. The presence of confined pus threatens necrosis, and the presence of necrosis and pus threatens meningitis, cerebral abscess, pyæmia and death.

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