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EXTIRPATION OF CHRONICALLY INFLAMED TEAR SACS.

A PROPHYLACTIC MEASURE AGAINST DISEASED CONDITIONS OF THE CORNEA.

BY

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The practice of excising the lacrimal sac has been followed by ophthalmic surgeons for a number of years, but generally only to remove diseased conditions in this structure. This procedure has, however, also been adopted to advantage as a prophylactic course against the infection of corneal incisions and other serious sequelae in intraocular operations, when the tear sac has been found to be unhealthy. But the routine practice of removing this source of infection as a preventative measure against ulcers and other pathological conditions of the cornea, which produce partial or complete blindness, has only been fully appreciated comparatively recently.

Axenfeld with an experience of many hundred excisions states that nearly eighty percent of these belong to members of the working classes. Such people can least afford the loss of sight, which, unfortunately, occurs in nearly thirty-five per cent of these cases of dacryocystitis by the formation of permanent dense opacities of the cornea resulting in blindness. These statistics cannot but impress one with the serious handicap, placed upon these unfortunates, as wage earners, in the struggle for existence. The tax, which they must sooner or later become to the community is another serious consideration which cannot be overlooked. Such facts show, beyond all doubt, that an individual suffering from chronic dacryocystitis, is constantly menaced by severe ulceration in the cornea, resulting in complete or partial loss of sight, a condition which, in a very great many cases, can be avoided.

Ricchi working on this subject, classifies the results of his bacteriological examinations as follows. The micro-organism by far the most frequently found is the staphylococcus albus. In addition to this

he found the staphylococcus pyogenes aureus and staphylococcus pyogenes citreus, the bacillus coli, and streptococci. He also found a host of saprophytes, as the bacillus subtilis, radicosus, ramosus, luteus, fluorescens putidus, and sacchromyces with many others, and in one case showed the presence of the actinomyces albus. One organism, that most dreaded by ophthalmic surgeons in cases of corneal abrasion, the pneumococcus, is strangely enough not included in Ricchi's classification. Axenfeld states that his diplobacillus is also found to flourish here as it does in the conjunctival sac.

Many workers along these lines have shown that if there is a stricture of the lacrimal canal at any point, more particularly at the nasal duct, as is most commonly the case, that stagnation of the drainage of tears is produced, and that no more fertile culture medium can be found than the lining of the sac. We also know that, in diseased conditions of the lacrimal sac, the organism most commonly found there, the staphylococcus albus, assumes a decidedly more virulent form than when it is found in the conjunctiva with the tear sac in a healthy state. Further, when a diseased sac has been removed, that a non-virulent species of micro-organism is generally found to be present in the conjunctival secretion, whilst, when the diseased sac is undisturbed, forms of a much more virulent type are found to flourish.

That there are numerous cases of stenosis of the nasal duct and many of actual dacryocystitis where no rational treatment has been attempted or requested is a fact brought home to us every day by many of the unfortunate conditions of permanent blindness due to subsequent corneal involvement. We cannot close our eyes to the fact that there are numbers who cannot or will not wear protecting glasses and yet who are, on account of their respective callings, daily exposed to corneal injuries. The mechanic, the foundry-man, the farmer, the lumberman, are to be numbered amongst those who are frequently, unknown to themselves, afflicted with tear sac trouble, at the same time to whom superficial injuries to the cornea are of frequent occurrence. Country people particularly are exposed to tremendous risks. Such people suffering from dacryocystitis are frequently isolated from any one with a definite knowledge of special diseases of the eye, and disastrous results may follow a simple abrasion of the cornea by a wisp of straw or the end of a twig.

An excellent opportunity for permantently curing dacryocysitis and preventing many lamentable conditions of blindness, more particularly in the poorer classes is at our hand in the radical extirpation of the lacrimal sac. Ophthalmic surgeons are slowly but surely becoming

convinced of the fact that conservative methods of treatment have been unsatisfactory. Even though the stricture be opened bacteria are still likely to re-collect in their former habitat when the stricture reforms as it probably does after treatment has been discontinued after a little time. The use of the galvano cautery only produces additional cicatricial tissue without completely removing the diseased mucous membrane. Probes are actually dangerous in the hands of the inexperienced; periostitis, false passages, rupture of ethmoid cells, with the formation of chronic inflammatory tissue in the neighbourhood rendering subsequent dissection and extirpation of the sac more difficult and tedious are some of the results due to the use of probes.

Besides, it has been shown, in cases of dacryocystitis that the stricture is produced as a rule, not by a swelling of the mucous cells as we would suppose, but by an engorgement of the subperiosteal veins. Probing the sac in such cases can easily be seen to be useless. Furthermore, in poor people and still more in people living at a distance from medical attendance, it is absolutely impossible to have treatment of a conservative character satisfactorily carried out for any length of time. The conservative treatment, in cases of chronic suppurative dacryocstitis, dilatation of the sac, fistulæ, recurrent erysipelas and perilacrimal abscess with dacryocystitis we must admit as unsatisfactory. In actual hypopion ulcer of the cornea or keratitis with any of the above mentioned conditions an excision is not only indicated but imperatively demanded. One must, however, take the precaution of avoiding undue pressure upon the globe.

From a bacteriological standpoint, as I have already related, the procedure of excising the tear sac is most heartily to be endorsed. We have seen that conjunctival sacs with tear passages containing a very virulent micro-organism show a much milder form of bacteria or no bacterial growth at all when once the tear sac has been excised.

But while many have acknowledged that the complete removal of the lacrimal sac in diseased conditions is frequently indicated the operation has been unpopular on account of the hæmorrhage which takes place during the operation. Further, the field is frequently hidden by blood and fragments of the secreting membrane of the sac are left remaining in the wound of the cavity; epitheliation occurs, and fistulæ result. Axenfeld's recent work on the subject and the technique employed and recommended by him have rendered the operation decidedly easier, and have removed many of the difficulties which formerly prevented ophthalmic surgeons from excising the sac, appreciating though they did that a total extirpation was indicated as the best prophylactic measure to be adopted against future corneal trouble.

The method employed by Axenfeld is as follows:— The field of operation is rendered as aseptic as possible by the use of soap and water and then by an application of a solution of bichloride of mercury Should one prefer to operate under local anæsthesia, a few drops of a four percent solution of cocaine in one-in-a-thousand adrenalin is injected into the tissues about the sac fifteen minutes before the patient is placed on the table. This injection is repeated immediately before the operation. I, however, prefer to operate using general anæsthesia because after seeing a great many diseased sacs removed under a local anæsthetic I am not satisfied that the method is a painless one. A veil of sterilized gauze, with an opening large enough to expose the patient's eye, side of the nose, and upper part of the cheek, is spread over the face. The initial incision is made from the inner canthus directly above the internal angular ligament, two or three milimeters in front of the crista lacrimalis. The incision should be directed downwards and outwards in a crescentic direction for about two and a half centimetres. This incision must be quite deep cutting through the periosteum. A shorter incison than the one I have specfied should not be attempted: there are occasions where a very prominent crista lacrimalis will almost occlude a view of the sac in the under lying fossa, and unless an aperture is made sufficiently large to expose this fossa and its contents there is always the danger of leaving a part of the secreting membrane of the sac in situ. Subsequent fistula formation is the inevitable result. The consideration of a slightly smaller incision from a cosmetic standpoint is not to be considered; the wound heals by primary intention and after a short time little or no evidence can be found of the previous incision.

One of the chief difficulties in this operation is the suppression of a violent and obstinate hæmorrhage. The employment of Pæns forceps is impossible on account of the smallness of the cavity and because the vessels are situated so deeply they cannot be fastened upon. After the primary incision is made, digital pressure is exerted over the wound for one or two minutes, and then Müller's small speculum is introduced, holding the edges of the wound apart laterally. A much larger speculum, with reversible and adjustible tips corresponding to the ends of small sharp retractors, an instrument specially devised by Axenfeld for use in this operation, is then placed in postion. This separates the edges of the wound vertically. These specula serve two purposes; they expose a quadrilateral field for operation and are of decided assistance in arresting hæmorrhage. In addition, they eliminate the necessity of having an assistant's hands holding retractors in front of the operator.

Bloch, of Freiburg, has made a suggestion regarding the control of hæmorrhage which Axenfeld carries out, a procedure which I have followed in the cases upon which I have operated. A large number of wooden applicators about the shape and size of a penholder are previously sterilized and the tips armed tightly with sterile absorbent. Firm pressure and swabbing can be undertaken in this manner, procedures which could not be followed so well with the ordinary gauze sponge. These applications are also of service in re-applying adrenalin solution to the wound.

The periosteum is now carefully retracted forward over the edge of the crista lacrimalis and downwards as far as the bony canal covering the nasal duct. If the hæmorrhage is sufficiently under control the lacrimal sac should be seen nestled in the underlying fossa lacrimalis. The sac is now seized by a pair of fixation forceps and drawn gently forward, while a careful dissection with a pair of small sharp-pointed curved scissors is begun below the sac. A method which I have found to be of decided value and which I always employ at this juncture is, when once I have separated the sac at one point from the underlying fossa, to introduce a tenotomy hook under the sac. I an now able to follow the sac downwards to the nasal duct and upwards to the puncta, always cutting beneath the heel of my hook without fear of wounding the sac above. Very little subsequent dissection of the overlying connective tissue is necessary and the sac is severed as close to the puncta above and to the nasal duct below as is possible. When the sac has been removed a specially devised curved currette is introduced into the nasal duct which is quite denuded of its mucous surface: this procedure allows subsequent drainage of the cavity for one or two days after the operation, and assures the operator of complete stenosis by the formation of cicatricial tissue about the duct rendering any subsequent infection through the nose impossible. The wound cavity formally occupied by the sac is thoroughly irrigated with warm bichloride solution and the edges of the skin wound are brought together by a few silk sutures. A small firm roll of absorbent cotton about the thickness and half the length of one's little finger is placed over the line of incision, and a firm compress dressing is applied. This should be left undisturbed for three days; the sutures may be removed on the fifth day.

The advantages of this procedure are briefly as follows:—The operation is not dangerous; a very small wound is necessary, allowing one all the space he requires to carry out a complete dissection. As very little disturbance takes place in the surrounding tissue there is no reason for producing secondary complications, as injury to the ethmoid

cells, or periostitis. The operation is a complete one; the sac being removed from the canaliculi above to the nasal duct below and the mucous membrane lining the nasal duct being completely curetted away no secreting surface remains; an absolute sense of security from future infection from this source is thus afforded both the patient and the surgeon. From a cosmetic standpoint it is all that can be desired; the very small incision is hardly more noticeable than one of the ordinary lines of the face.

The objection that, after excision of the sac, tears are still secreted and that epiphora continues does not hold. We know from actual experience that when this source of infection has been removed irritation of the conjunctiva is allayed and the reflex secretion of tears not produced. Should, however, tears persist to secrete the difficulty can be readily overcome by the simple operation of excising the accessory lacrimal gland, a procedure which is never followed by any untoward results.