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Passed August 1881

Suggestions in Ophthalmic Surgery.

A Thesis for the Degree of M.D.

μέγα βιβλίον μέγα κακόν

As it is understood that an account of work or observations more or less original is to be aimed at rather than the display of a knowledge of medical or allied literature, the statements in this Thesis have been made as clear & short as possible, & names & methods of authors have only been mentioned when they helped to explain descriptions of procedures believed to be in some respects new. That the points thought to be of importance may be brought out all the more distinctly they have been written out.

out in order at the end of
Each subject.
The following are the Operation
Considered — (1) Slitting up the
Canaliculus (2) Probing the nasal
duct (3) Dacryotomy (4) Operation
for Cataract.

1 Slitting up the Canaliculus.
The remarks to be made will be
Easily followed if the lower Canal
be taken for an Example. All
instruments that cut from without
inwards are at a Mechanical
Disadvantage in this Operation
as they act in the same Di-
rection as the fibres of the
orbicularis muscle which con-
tracting firmly from the irritation
of the knife carry the soft
parts towards the middle line.
The contraction of the muscle can
with difficulty [illegible] best work
imperfectly

imperfectly be overcome by the operator keeping the parts tense with his free hand as a natural result the inner end of the canaliculus which is so frequently the seat of stricture remains intact & the operation useless though apparently successful by its having converted the outer portion of the canal into a groove. Here enters which applying to scissors sheathed knives cutting from without & bistouries guided by small grooved directors, but more particularly on instruments of the nature of Weber's knife. As it acts somewhat like a lever of the second kind, the fulcrum being obtained by the probe-pointed portion of the knife resting against the inner wall of the lachrymal sac.

Even

Even apart from the unfavourable action of the muscle upon the fact that the unsheathed blade of the knife often begins to cut before the instrument has been fully inserted, thus increasing the muscular spasm, the lever-action mentioned above necessitates decrease in power in proportion as the working part of the blade is nearer the fulcrum, & thus but little cutting action (or in this case leverage) is brought to bear at the point where the canaliculus ends in the sac, in many cases it fails to be divided at all.

As a substitute for these instruments a combination of a curved probe with a sheathed knife cutting from within outwards is

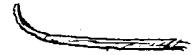
is suggested. The probe is to be of the length & shape of the probe-pointed portion of a ~~Weber's~~ Weber's knife, but much finer & not so bulbous. The rest of the instrument instead of consisting of a simple cutting blade is a small canula open at a point corresponding to the place in ~~Weber's~~ Weber's knife where the cutting edge is merged into the probe, & containing a very fine concealed curved bistoury which can be projected at pleasure. The instrument is passed into the lachrymal sac the knife projected to the desired extent & the canal laid open by the simple withdrawal of the instrument the knife being kept protruding from the canula. At its introduction the

the instrument is simply a fine probe & does not cause sufficient irritation & bring about contraction of the orbicularis. When the knife is projected its point lies free in the lachrymal sac & pain is only caused at the time of withdrawal, at a time that is to say. When spasmodic contraction of the orbicularis aids in the laying open of the canal.

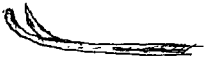
Points of importance

1 The advantage of a sheathed knife cutting from within outwards

2 The free division of the inner end of the canaliculus.



Ready for insertion



Ready for withdrawal

Probing

2 Probing the nasal duct

Although some authors consider probing of the nasal duct of such slight & temporary benefit that they discard it altogether, in the following remarks it is taken for granted that the operation is a justifiable one.

The directions usually given are that the probe should be passed along the canaliculus or groove formed by the divided canaliculus, till it enters the sac & comes against the mucous membrane covering the inner bony wall, then the operator should raise his hand till the probe corresponds with the supra-orbital foramen, or (& this indicates quite a different line) till it is vertical, then it will engage in the entrance of the

the duct & can be pushed steadily onwards till it reaches the floor of the nose. An attempt will be made to show that these directions are anatomically wrong, & if rigidly followed are the likely cause of the formation of false passages. As a rule of for the large proportion of cases it may be said that the probe finds the duct in spite of the surgeon & the directions. The following method is suggested as more correct. Those probes are the best which are soft & easily bent, & have a flat oval portion at their centre, serving as an index of the 2 ends of the probes, as a firm point of support for the surgeon's fingers, & as a guide to

the

the position of the point. The extent to which the probe should be bent depends on the shape of the patient's supra orbital ridge, the object of the bending being to carry the point well forwards. Dissection will show that at its beginning the duct passes well outwards - an important fact as violence in a wrong direction in spite of bend in perforation of the lachrymal bone. It enable the probe to gain naturally in the duct if should be carried well inwards beyond the vertical line opened against the root of the nose in order that the point may direct itself outwards & glide with ease into the opening of the duct.

It is highly important that

the surgeon's hand should be as far back as possible & the point of the probe forwards, as it (the probe) is not easily pressed too much to the front, but is very apt to strike against & possibly perforate the floor of the orbit behind the duct. If the usual direction be followed & the probe merely raised to the vertical the point will strike against the floor of the orbit & the outer side of the duct, which if it is only raised to the level of the supra-orbital notch & pushed steadily on, it will perforate the lachrymal bone. When the entrance to the duct has been gained the probe should be pushed firmly & steadily

steadily onwards, in some cases being rotated in a way analogous to the tour de maître in urethral catheterism.

Frequently when the point has almost gained the floor of the nose it is difficult to make it go on without undue violence. If however it be driven on it usually overcomes the obstacle with a jump. This sudden movement & the appearance of a few drops of blood at the corresponding nostril are looked upon by some operators as a proof that the obstacle has been overcome. This however is probably not the case & the explanation is possibly found in the following anatomical facts. From the way in which the nasal

Descriptions

description of the nasal duct are worded the idea is conveyed that it is a bony canal leading from the lachrymal sac to the vicinity of the floor of the nose. The fact however is that the duct has a complete bony wall for but a comparatively short way & when the probe has traversed this portion any additional obstacle probably arises from the point of the probe catching in the soft parts. As affections of the nasal duct & catarrh of the mucous membrane of the nose are frequently found in the same persons, it is likely that the probe point catches in the membrane covering the wall of the vestibule and

and the sudden stop + bleeding are the results of laceration.

When this secondary obstacle as it were is found the probe instead of being pushed on should be drawn slightly back + its direction changed by a movement of rotation.

Points of importance

1 Carrying the probe well towards the middle line.

2 Passing the point at first well outwards to avoid the lachrymal bone

3 Iridectomy

Iridectomy apart from cases of synechiæ is usually performed for (1) making a false pupil in cases of opacity (2) relieving tension (3) facilitating extraction of the lens. In cases of tension (notably in glaucoma) it is desirous to make a large wide coloboma reaching right to the periphery, but in the other instances the smaller the piece of iris removed the better — in opacity, enough but not insufficient light in cataract, enough to interrupt the pupillary ring. For optical purposes the more central the artificial pupil is the better it is, the peripheral portion first should be as narrow as possible. Unfortunately in the ordinary way of performing iridectomy the opposite of this is the case, the removed

moved piece of iris leaving a triangular gap whose base is peripheral apex central. This defect however can be remedied by a very simple measure. As the operation is ordinarily performed the iris scissors are at right angles to the line of traction of the iris forceps, or (if forceps have not been necessary) at right angles to the line of protrusion of the iris, but if the scissors be used in the same line as the traction or protrusion of the iris it will as a rule be found that the deficiency formed in the iris will be broad at the pupillary margin narrow at the periphery. Not only is the coloboma a more desirable shape, but by this method it is more difficult to fall into the mistake of cutting the iris too close to the angles of

of the corneal incision, & the very action of the blades of the scissors sweeping from the corners to the centre of the wound tends to gather up, as it were, the cut portions of the iris & facilitate their return into the anterior chamber. In the other method of using the scissors attention need hardly be drawn to the fact that this sweeping action to help in getting the iris back into its place has often to be performed by the canula. In the method of operating that has been advocated the Bowman's scissors would be in such an awkward position that it is difficult to attain the necessary amount of steadiness, unless special scissors be made bent almost at a right angle but any inconvenience of this kind can however be overcome by allowing the assistant to

borne the scissors. And here it may be added that before operation be performed it is better to instruct the surgeon & the assistant who must be trained & experienced. The new handling over of the fixation forceps to the assistant after the anterior chamber has been opened is apt to cause traction & tension during the time when the iris forceps are being used & eye is more in the power of the surgeon. He is better prepared to meet any movement of the patient or rolling of the globe, & he is more sensible of the amount of traction made in different direction. By the iris & fixation forceps respectively, if he holds both forceps & the scissors are managed by the assistant. Surgeon should anything

anything dangerous to the success of the operation, or safety of the Eye, occur suddenly, the Operator by holding both forceps can let the globe fall much more speedily than if the fixation instrument were in the hands of the assistant.

Points of importance

1 The iris scissors forceps to act in the same line.

2 The scissors to be used by the assistant.

4 Operation for Cataract.

There exist a few objections to operations for hard cataract by transfixion, whether these operations be flap, linear, or modifications. All surgeons are not ambidextrous & there are pretty strong arguments against incisions made downwards. It is difficult to exhibit with facility the seat of the counter puncture. The operator is often surprised by the swelling caused by aqueous escaping & finding its way below the conjunctiva. The internal incision in the cornea & the seat of counter-puncture must be smaller than the external incision. The knife has to cut through rather a large amount of corneal tissue at one time - at the beginning of the flap at least two thicknesses of

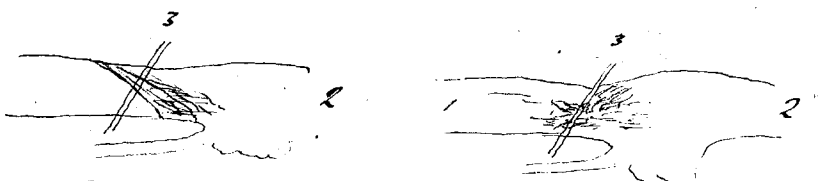
of the cornea, at the end when the knife is cutting out a much larger portion. There is always a danger of finishing the flap too soon if the eye rolls upwards. A forceps with teeth may in some cases be necessary to keep it in its place. It is more than probable that transfixion itself of the formation, as it were, of a temporary excentric axis for the globe is a cause of some increased intra ocular pressure. In Streatfeild's Calvert operation these disadvantages are avoided, but with a Beer's or linear knife, especially if the superciliary ridge be at all prominent, it is difficult to make the section without heavy bevelling of the incision, in consequence

sequence of which there is but little space gained in proportion to the amount of the opening made, & there is always some difficulty in getting the lens to present past the edge of the sclero-corneal portion of the wound. In addition to this it will be found that the linear is in many other ways unsuited to making an incision in this manner but more especially from the fact that the wound is seldom smooth even. Other arguments present themselves in favour of what may be termed incision by puncturing instead of transfixion. The amount of corneal tissue that the knife cuts through at a time is very small - half, often less than half of that cut through in the other operation

Operation should the eye roll upwards traction is not at all necessary, as the knife itself keeps the globe in the best position, any pressure it may cause, if the eye tends to move outwards towards the cornea does not increase the intraocular tension. The knife proposed for this operation is a short broad knife - its length being about equal to the diameter of the cornea its breadth at the heel about the same, i.e. one third of the circumference of the sclero-corneal ring. To clear the superciliary ridge it is best to have the angle of the blade also curved as the flat like the instrument proposed by Adolph Weber

holder. The object of the carving on the flat is to prevent handling of the corneal incision. If it be desirous to make a small incision the knife must not be pushed in to its full length. if a large one be an object the enlarging can be done as the instrument is withdrawn. In any case, in removing the knife the point is tilted so that the oblique edge cuts out in a straight line in order that the incision in the cornea may be as large as intended. In connection with making the puncture some anatomical details are worth attending to. The relation of the cornea

cornea + sclerotic is sometimes likened to that of a watchglass & the metal in which it is set — the sclerotic overlapping the cornea. This comparison is wrong & misleading. The one tissue gradually merges into the other, fibres with well-marked scleral characters frequently ramifying in the central portion of tissue which in its surface is corneal in character. The following diagram will show what is meant



1 Cornea 2 Sclerotic 3 Line of incision.

According to the watchglass view a knife passed through sclerotic near the scleo-corneal margin was

does not span through cornea, & consequently do not lacerate the deeper parts of the cornea. A glance however at the 8th diagram will show that in many cases an incision passing through cornea superficially will transfix sclerotic when it goes deeper & will be in danger of opening the Schlemm's Canal & other vessels.

The above method of operating for Cataract is called Graefe's Knife. It is favourable cases additional modifications & improvements may be introduced. As these may not be applicable in all cases they will be noticed very briefly. It is a well known & troublesome fact in operating that there is occasional difficulty

Difficulty
in lacerating the capsule after
the anterior chamber has been
opened & the aqueous has escaped.
The cornea has at last come
to a good view of the parts is
not easily obtained. The iris may
have contracted & not much capsule
be exposed to view. The balance
of the eye is lost & the elastic
ligament is more or less torn &
the vitreous disturbed. If the
operation be performed by simple
linear aqueous is necessary;
consequently if the pupil be
fully dilated with atropine
it is often possible to lacerate
the lens capsule very freely with
a curved cutting needle before
the corneal incision has been
made. Fixation can be used
as the balance of tension is still
unchanged

unchanged, & the matured or soft
condition of the cataract is
fully made known before the
more difficult part of the
Operation have been commenced.
The laceration of the capsule
can always be executed by
using the puncturing knife
with the recurving & Mac-
Namara's retard.
If in the Operation for Cataract
by transfixion the Operator makes
a conjunctival flap all its
advantages are sometimes
counterbalanced by bleeding
into the anterior chamber from
the conjunctival wound.
In some cases, especially if
the cataract be small & hard,
it is possible to deliver it
subconjunctivally without any
bleeding

bleeding into the anterior Chamber.
A narrow linear knife is taken
& a portion of conjunctiva is
transfixed as close to the cornea
as possible, & of a breadth equal
to that of the base of the intended
flap. A long narrow flap of con-
junctiva is now cut upwards, ere
the knife is withdrawn before
the apex has been divided.
A pause is made till all
bleeding has entirely ceased,
after which the corneal section
is made, its central portion
corresponding with, & opening
into, the base of the conjunctival
flap. The conjunctival flap,
though remaining attached at its
apex, should be so long & narrow
that there is sufficient room
to

to deliver the lens at its side & on the centre of the corneal flap passes by continuity of tissue with the base of the conjunctival one, & the apex of the latter is continuous with the general conjunctiva, not only are the chances of corneal sloughing much lessened, but rapid healing along with perfect coaptation & consequent absence of alteration in the corneal curvature is a more likely result.

Points of importance

1 Operation of puncturing
2 Rupture of capsule before cornea is incised.
3 Modified conjunctival flap.

S. Mackellar

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