On Cataract In India
Its pathology and treatment

By Surgeon D. M. Jack M.B., C.M.
Indian Medical Service
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The natives of India, in common with those of other hot and dry climates are peculiarly liable to diseases of the eyes. The reason for this is obvious in most cases. For instance, dust, heat, glare, dirt and Contagious light up Conjunctivitis which, when left to run its course as it so frequently does, generally leaves the membrane in a diseased state which is the forerunner of further changes. Not to speak of the Cases most common in infants where it is at once fatal to vision from Vomiting of the Cornea. And of the Very Slight Cases where it has done no further damage than to leave the Conjunctiva loose, Discoloured, and disposable there is a large number of Cases where Granulations have been left which have led to Changes in the Cornea, directly or indirectly, as the result of friction or indirectly through Changes in the Curvature of the lids leading to Trichiasis. Large numbers
of cases of Central Sclerosis the result of
small pox are also seen. As regards the
inner structures of the eye the intense glare
is a sufficient cause for the large number
of cases of night blindness met with in
India. The Chronic inflammatory chang-
es constituting Sclerosis are also fre-
quently met with, their frequency being
sufficiently accounted for by the intense
light and heat to which the masses of the
people are constantly exposed. On the
other hand, natives are less liable to
errors of refraction than the inhabitants
of more advanced countries, the reason
being that the children of the poorer class
are not taught to read or write, and as
a consequence are not under the necessity
of constantly straining their accommoda-
tion in looking at near objects.

Catarract

Catarract is a disease which
is attracting great attention at present
among British Surgeons in India
and the operation for its removal is
being practised on a larger scale every
year. My attention was first directed
to this subject in the year 1881 when I
was appointed to the Medical Charge.
of a district in Oudh. My experience of the
disease is therefore as yet rather limited
but I have made a careful study of each
individual case that has come under
my notice, which is in some degree a
compensation for my not having had
opportunities of making myself better
acquainted with the literature of the subject.

The causes of the disease in India
do not differ very greatly from those in
England except in the preponderance
of cases caused by insufficient or unsuit
suitable food. The number of infantile
and congenital cases is small. I have
met with only one case where the disease
was fully developed in childhood. In this case the disease was associated
with atrophy of the retina. I met with
another case in a man aged 25 suffering
from diabetes. The great majority of
the cases are to be met with in middle
aged or old people in the former class.
The cause is usually insufficient or unsuitable food—a fact which is
proved by the great increase of the disease
in times of scarcity and by its frequen
cy among the inhabitants of rice.

Causes
growing districts. Glaucoma is also a frequent cause of Cataract in middle aged people, and I observe that it usually causes the nuclear form. In young people the disease is usually part of a general decay and is found in its progress.

Forms. I have never met with the black Cataract spoken of by Mr. Brudenell Carter (Diseases of the Eye Chapter 7, page 343) nor with the cataract or capsular form mentioned by the same author (Diseases of the Eye Chapter 7, pages 335-336). The forms I have seen have always been the usual ones, the nuclear and the cortical all primarily (with one exception) of the hard variety. The Striated Cortical Cataract appears to be the commonest in young subjects and in middle life. The nuclear being more frequently met with in aged people and in those cases where the disease is caused or accompanied by glaucoma. In Cortical Catarracts of old standing it is not unusual to find the Cortex completely broken down and transformed into a milky fluid in which a small, hard, pale yellow and highly refractive nucleus...
will be seen sunk at the bottom of the eye. Coming into view where the patient is erect and passing out of sight when he lies down. Calcareaous Deposits are not unfrequently seen on the Capsule in Cases of Disintegrating Striated Cataract.

Diagnosis.

The diagnosis in Cases of Cataract is a very simple matter as regards the Cataract itself, the appearance of the lens is distinctive in the more advanced Cases of both the Cortical and Striated Varieties. The question of Complications will be spoken of in treating of the examination of the Eye.

Prognosis.

This question is one which presents itself more especially in Cases where the disease has commenced but not fully developed. The point to decide is as to the rapidity of the degenerative process. This is much more rapid in Cases of Striated Cortical Cataract in Middle aged subject than in the Nuclear form. As a rule in Cortical Cataract one to two years is the time from which the patient first noticed his vision failing before it was reduced to perception of light. I have noticed several Cases of Nuclear Cataract in old people who had still
Treatment

Before entering on the question of Examination, Treatment, &c. (with all Examination offer of Eye.)

Eye must be made. I propose illustrating my remarks on this subject from the Cases in which I have operated. Unsuccessfully on account of Complications which were or should have been recognised before the operation was undertaken. Having ascertained that the Lachrymal Apparatus, the Conjunctiva, and the Cornea are normal, I carefully examine the pupil as to its mobility and inquire if there is any history of pain or otherwise. The next point is the depth of the Anterior Chamber. Being satisfied on these points I carefully examine the globe as regards its tension and note any undue prominent. It is necessary to be very careful on all these points in order to exclude Chronic Glaucoma, which is not unusually found associated with Cataract. Apart from those cases of Glaucoma Conus naturae, where Cataract is a direct consequence of the disease. A want of appreciation of these facts has caused me more than one disappointment.
In one of my earliest cases the operation had been done to my complete satisfaction. The patient was carefully watched, and was not removed from the bed on which the operation had been performed, on training not vomiting had occurred, but intravascular hemorrhage set in after a quarter of an hour and the eye was lost. On a careful examination of the other eye I found signs of chronic glaucoma. In another case performed at Barrack-poor Dispenary in December 1893 the operation had been performed without the loss of vitreous, the pupil was left perfectly clear and the case seemed a very hopeful one but the incision did not heal kindly, a zone of sclerotic redness appeared and persisted. Vision was sometimes fair but at others almost nil and the patient was discharged only slightly relieved. I regret that an ophthalmoscopic examination was not practicable but an examination of the other eye revealed a very slight increase of tension, some prominence of the eyeball and a shallow anterior chamber. The lens was too opaque.
to admit of a view of the fundus but it is probable that a considerable degree of glaucoma was masked by yielding of the humors of the eye. In cases where the Cornea is vascular there is a danger of nonunion on account of lowered vitality. If the eye is satisfactory in all these respects I instill a drop of a 1/10 grain solution of atropine and when the pupil has dilated I again examine the lens. In doubtful and Con temporizing Cases I use the ophthalmoscope, in advanced ones I use focal illumination if there is any doubt. This method is especially valuable in Cases of nuclear Cataract where it is important to determine the depth of the Clear Cortical zone surrounding the degenerated nucleus. This is easily done by noticing the breadth of the Shadow cast by the iris on the lens.

The question of “When to operate” must be decided differently according to a patient's circumstances. I think the best rule, and the one to which I generally adhere is to operate when the patient is no longer able to earn his
I operate sooner in cortical cases than in nuclear ones and as a rule I prefer to postponie all cases that are not perfectly formed, presenting themselves in the rainy and feverish months. With a view to showing the influence of rain on the success of the operation I give the following table compiled from the Annual Reports of the Azamgurh Hospital for the 6 years 1878-83.

Statement showing the result of cases discharged from the Azamgurh Dispensary for each month of the year for the 6 years 1878-83.

<table>
<thead>
<tr>
<th>Months</th>
<th>Total</th>
<th>Good</th>
<th>Some Failure</th>
<th>Failure</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>191</td>
<td>117</td>
<td>34</td>
<td>40</td>
<td>44.25%</td>
</tr>
<tr>
<td>February</td>
<td>126</td>
<td>93</td>
<td>15</td>
<td>18</td>
<td>73.80%</td>
</tr>
<tr>
<td>March</td>
<td>148</td>
<td>105</td>
<td>21</td>
<td>22</td>
<td>70.91%</td>
</tr>
<tr>
<td>April</td>
<td>91</td>
<td>52</td>
<td>11</td>
<td>28</td>
<td>67.41%</td>
</tr>
<tr>
<td>May</td>
<td>75</td>
<td>50</td>
<td>6</td>
<td>19</td>
<td>66.66%</td>
</tr>
<tr>
<td>June</td>
<td>80</td>
<td>44</td>
<td>10</td>
<td>26</td>
<td>55.00%</td>
</tr>
<tr>
<td>July</td>
<td>91</td>
<td>63</td>
<td>16</td>
<td>22</td>
<td>68.17%</td>
</tr>
<tr>
<td>August</td>
<td>95</td>
<td>57</td>
<td>13</td>
<td>26</td>
<td>60.00%</td>
</tr>
<tr>
<td>September</td>
<td>82</td>
<td>38</td>
<td>17</td>
<td>27</td>
<td>41.34%</td>
</tr>
<tr>
<td>October</td>
<td>96</td>
<td>45</td>
<td>19</td>
<td>31</td>
<td>47.92%</td>
</tr>
<tr>
<td>November</td>
<td>117</td>
<td>108</td>
<td>15</td>
<td>24</td>
<td>70.47%</td>
</tr>
<tr>
<td>December</td>
<td>185</td>
<td>127</td>
<td>26</td>
<td>32</td>
<td>68.14%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1406</td>
<td>889</td>
<td>203</td>
<td>314</td>
<td><strong>63.23%</strong></td>
</tr>
</tbody>
</table>
In cases where there is a suspicion of glaucoma I generally perform iridectomy, warning the patients that they are not to expect complete restoration of vision.

The operation performed in India for the cure of Cataract is usually von Graef's linear method or some slight modification of it. Before discussing its merits I wish to notice the operation of Couching which is still largely performed by natives with more or less success.

Couching. This is an operation of great antiquity in India, being handed down from father to son as other trades and occupations are, and is performed as follows. The patient having been made to sit or lie down the Sathia or native oculist makes a puncture with a sharp pointed instrument into the Sclerotic, usually on the outer side. He then introduces a blunt pointed instrument like a probe, through the wound and pupillary area, and makes a rotary movement on the lens till he succeeds in dislocating it. He then finishes the operation by gently depressing the lens into the vitreous.
Humour. The patient has to remain very still after the operation, the least coughing, straining or sudden movement of the head being liable to bring the lens forward again in front of the pupil where it will obstruct vision or into the neighbourhood of the iris or ciliary region where it sets up dangerous and generally fatal inflammation. In cases where it is successful good vision—\( \text{at least for a time, is the result of the operation. With a view to comparing the results of the operation with those of linear extraction I have taken notes in 30 cases taken at random from a native bazaar. An abstract of the results may be interesting. The total number of eyes observed in the 30 patients was 61. Of those 13 or 51.70 per cent had good vision; 4 or 9.76 per cent had some vision, and 24 or 58.53 per cent had no vision. I regret that the conditions under which the enquiry was made rendered an ophthalmoscopic examination impossible, but the cases had to be searched for in the City and most of the observations were made in the public street. Of the 13 successful cases the average period since the operation was 3 years.} \)
and 10 months. Vision was good in them all and was rendered approximately normal by the aid of ordinary cataract glasses. The most remarkable facts which I noted in regard to these eyes were in connection with the state of tension of the eyeball and the state of the iris and pupil. In only 1 of the cases was the tension normal, in 2 it was slightly increased but in the remaining 3 it was decidedly high. As a rule the pupil was small and in no case did it act freely to light; it was not unusual to find it oval and eccentric, and I noticed in every case that the iris was tremulous, vibrating at every movement of the eyeball. This vibration must be caused by oscillatory movements of the dislocated lens; it is conducted by the iris to the aqueous humour and is pathognomonic of an eye that has been subjected to the operation of couching. In the 5 cases noted in which the operation was partially successful the average period since the operation was 7 years and 9 months. In one case the tension was normal and in the remaining 3 it was increased. It was impossible to decide
The course of the disease in each of the 24 cases where the operation had failed, as the accounts which the natives were able to give of themselves were necessarily very imperfect, the actual condition of the eyes in the 24 cases was as follows. There were 9 instances of atrophy of the globe, 8 of glaucoma, 4 of occlusion of the pupil, and 1 each of staphyloma, irido-choroiditis, and sloughing of the cornea. For purposes of analysis the cases fall naturally into two groups, the first group including those cases where the operation failed from the beginning and the second those where vision was gained at the time but was subsequently lost. There were twelve cases in each group. In the twelve cases where vision was never obtained, atrophy of the globe was present in five, glaucoma in four, occlusion of the pupil in two, and the cornea had sloughed in one. The history obtained from these cases was very unsatisfactory, but there was a suspicion of previous glaucoma in two, the cataract was said to be immature in one eye which is now glaucomatous, and there was a history of severe pain for a year.
in a case where the globe had atrophied
and in another, sympathetic ophthal-
mia had been induced which destroyed
the sound eye. Many of these unfortunate
people had been operated on against
their will. Of the twelve cases where
vision was obtained but subsequently
lost, it was lost in two cases within a
month, in three within six months,
in two within a year, in three within five
years, and in two, in periods over five
years. The condition of the eyes at the
time of observation was as follows: there
were four cases of atrophy of the globe, two
of occlusion of the pupil, four of glaucoma
and one each of staphyloma and iri-
de-choroiditis. The general history given
by the patients was that pain came
on and vision failed. One patient
stated that he had pain and sudden
loss of vision after ten years, his eye
was highly glaucomatous. Another
patient had gradual loss of vision
without pain after six years, his eye
was also glaucomatous. Another patient
with glaucoma gave a similar history,
his vision having failed after four years.
The lens was visible in only two cases in one, where the patient had fair vision a small, atrophied nucleus was lying free at the bottom of the anterior chamber in another, a large lens was lying in the pupillary area and vision was entirely gone.

Results of

It will be interesting to compare various the results of the various methods of Operation Cataract Extraction practised at various times and in different Countries. With this object I have brought together in one table the estimated results obtained before the introduction of Von Graefe's linear extraction and the results obtained by the latter method in an American hospital, for both of which my Authority is Mr. Brodmund Carter (Lett Amian Lectures, Lancet Janu-

ary 12th. of 1884, page 83) I give the figures showing the results of 11 observed cases where the operation of Conching had been performed by Gathias. The Statement as regards the results obtained in the North Western Provinces has been compiled by me from the Annual Return of the Surgeon General North Western Provinces and Andh for the years 1876 to 1882.
I conclude by a statement showing the results of the cases operated on by myself during the last three years.

A Comparative Statement Showing the result of operations for the relief of Cataract

<table>
<thead>
<tr>
<th>Class</th>
<th>1826-1827 Pre 1852</th>
<th>Cured</th>
<th>Retained</th>
<th>Otherwise</th>
<th>Cured</th>
<th>Retained</th>
<th>Otherwise</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>False operation prior to 1852</td>
<td>100</td>
<td>60</td>
<td>25</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York Ophthalmic Institute, Von Graefe's method</td>
<td>144</td>
<td>128</td>
<td>12</td>
<td>4</td>
<td>88.8</td>
<td>8.33</td>
<td>2.77</td>
<td></td>
</tr>
<tr>
<td>North Western Provinces and OrDR. 1876 to 1882</td>
<td>472</td>
<td>461</td>
<td>13</td>
<td>4</td>
<td>24.5</td>
<td>51.7</td>
<td>23.8</td>
<td></td>
</tr>
<tr>
<td>Most exclusive by D. Gordon</td>
<td>41</td>
<td>13</td>
<td>4</td>
<td>24</td>
<td>51.7</td>
<td>9.7</td>
<td>38.6</td>
<td></td>
</tr>
<tr>
<td>Couching by Ehrich</td>
<td>12</td>
<td>17</td>
<td>6</td>
<td>11</td>
<td>70.6</td>
<td>8.96</td>
<td>3.36</td>
<td></td>
</tr>
<tr>
<td>Results obtained by myself 1882-1885</td>
<td>17</td>
<td>14</td>
<td>6</td>
<td>11</td>
<td>70.6</td>
<td>8.96</td>
<td>3.36</td>
<td></td>
</tr>
</tbody>
</table>

The comparison as regards the cases of couching is scarcely a fair one as after that operation vision tends to degenerate whereas after extraction it does not. The results of the operation in the North Western Provinces (where it is practiced...
Causes of failure are numerous, and I believe in a great measure preventable. Throwing from personal experience, I should say that the principal causes of failure are want of care in selecting, want of skill in operating, want of good instruments, operating during the rainy season, and last, indiscretion on the part of the patients during the after treatment. I have already mentioned three cases where I failed from not making a judicious selection but most surgeons in India operate as long as there is any chance of improvement. As to want of skill I can recall several cases where a piece of cortical matter left behind has set up iritis and one where the lens was lost in the vitreous humour probably on account of a faulty incision. Of 18 cases operated on by me in the year 1882, 11 or 61 percent were successful, of 34 operations in the year 1883, 24 or 70 percent obtained good vision, and of 15 cases operated on in January and February 1884, 12 or 80 percent obtained good vision. This gradual improvement I think may be attributed to increasing dexterity.
Many surgeons in India use their own instruments, as yet I have not had this advantage and I can speak from experience of the difficulties presented by operating with lead instruments. The bar of the common double spring speculum is generally too close to the eye and hinders depression of the handle of the knife in making the counter puncture. There is great difficulty in getting knives properly set in India and many surgeons are in the habit of sending them to London for the purpose.

During the months I was officiating Civil Surgeon at Falchikar I operated seventeen times with one knife — the only other at my disposal being worthless. The great cause of trouble with a blunt knife is that if blunt at the point it goes in with a plunge, piercing the iris, if blunt on the blade the eye is subjected to a great strain during the process of division, the cut left is not a clear linear incision, the conjunctiva is excessively detached, all this leads to increased hemorrhage at the time and probably delayed union afterwards.

In one of my cases the points of the iris forceps did not meet accurately with the
result that the capsule was prematurely ruptured. In another instance the probe was so blunt that although used with the usual degree of lightness it failed to rupture the capsule and dislocated the lens instead. I have already spoken of the indifferent results obtained from the operation during the rainy and feverish months. I can recall two instances where an unfavourable result was brought about by indiscretions on the part of the patient himself. In one case the patient finding he could see on the third day disregarded my warnings as to keeping quiet and went out into the sun to cool his head having first pulled his bandages off; next day he had severe iritis and the case ended in total loss of vision. In another case where the patient refused to keep on his bandages iritis and delayed union resulted and the patient was discharged with very defective vision. In fourteen cases of which I have the notes, where the operation failed I find that the cause was sloughing of the cornea in three, occlusion of the pupil from lymph or cortical matter in one.
intraocular haemorrhage from glaucoma in two, restless exposure of the eye by the patient in one, and failure to extract the lens in one. In five cases where the operation has been partially successful, the cause of the partial failure has always been tritis. In one of them this disease had existed previously.

I have next to describe the operation with special reference to the practical details which appear to me to be of the most importance and of which I have had experience in my own practice. I have always used chloroform for operations of extraction, believing that the danger from vomiting and training is more than counter-balanced by the increased difficulties of operating without an anaesthetic, except in very expert hands. Dr. G. C. Hall of Allahabad who has had very large experience in cataract extraction always operates without anaesthetics. The next point is the position of the incision. In this, as in the other steps of the operation I always endeavour to follow out as closely as I can the directions given by Blandenial Carter in his Diseases of the Eye Chapter X.
page 386, where he says the incision should be just behind the margin of the cornea in a line two millimeters below the horizontal tangent. The centre of the incision should just pass through the sclero-corneal junction. Many surgeons are in the habit of making their incisions more in the cornea than this, for instance in Plate 1 of Christopher Keats's work on operative surgery the incision is figured as almost entirely corneal. Both plans have their advantages and their drawbacks. When the incision is principally in the sclerotic it is more difficult to make it accurately; there is greater danger of puncturing the iris on introducing the knife, there is greater liability to troublesome haemorrhage and to the formation of a conjunctival flap and a sharper knife is required. These disadvantages are more than counterbalanced by the smaller cicatrix obtained, a cicatrix too, which is kept completely out of sight by the upper lid, as well as by the smaller danger of sloughing of the cornea. I operated several times at Turnhout.
Making the incision more in the cornea the knife not being sufficiently thin for a satisfactory sclerotic incision I was struck by the ease with which the incision was made but also by the greater liability to prolapse of the iris. There is also a liability to errors of refraction caused by changes in the Curvature of the Cornea induced by a long Cicatrix. I always make the incision with the left hand for the left eye and vice-versa believing it right to practice this although it materially adds to the difficulty. In the performance of the iridectomy, I believe the principal point is to make it of moderate size, if too little of the iris is taken away there is a danger of the iris being pushed out by the advancing lens and thereby bruised there is also the danger that the prolapse may not be easily reduced. When this occurs I have several times with advantage removed a second and even a third piece of iris. This is much better done at the time than afterwards. The laceration of the Capsule
is much facilitated by having a hand in the shaft of the prickler. This is especially useful in the case of a deeply set eye or a prominent forehead. I have never followed any hard and fast rule as to rupturing the Capsule, but I always endeavor to rupture it horizontally as low down as possible, then above and then perpendicularly along the sides. I do not remember to have found the insufficient rupture of the Capsule a cause of difficulty in extraction of the lens but a case occurred to me lately where the Capsule remained in the pupil, probably lined with soft transparent cortical matter which would certainly have proved fatal to the operation had it been left. Finding it impossible to remove it by pressure from without, I introduced a pair of forceps and gently removed the whole Capsule En masse, satisfying myself by floating it in water that the whole Capsule was removed, no Vitrineous was lost, the Pupil was left clear and remained so and the patient
has now excellent vision. The same thing occurred when I operated on the other eye, and I removed the capsule in a similar manner and with a like result, except in cases where the cortex has become diffusent, I find it impossible to predict whether the lens will come out easily or not. In one of my cases I failed to extract it as it disappeared somewhat suddenly into the vitreous and was never seen again. The patient lost what little chance remained to him by running away from the Dispensary the same day. In another case the lens was removed with a scope with great difficulty, and only after the loss of a little vitreous. I attributed this to a faulty incision. I have twice enlarged my incision, once with scissors and once with a knife. Sometimes in the case of a large lens which does not escape with reasonable pressure after presenting in the lips of the wound, and in the case of a small hard nucleus which is too small to become engaged and which slips back on the pressure being removed, I have found great assistance from
Fitting the lens at its edge in one of the angles of the wound and drawing it upwards with a gentle motion of rotation in the plane of its circumference, being assisted by the scoop applied to the cornea. The escape of vitreous before that of the lens is an accident of rare occurrence. It has only happened to me twice.

The treatment of fragments is a question of great nicety and one which is liable to arise in all cases except in those where the cortex has completely broken down. I believe that this is the point in the operation where experience is of most value. The most insidious cases are those where there is a degenerated nucleus surrounded by transparent cortex. Having removed as much as I am able by gentle friction and pressure on the cornea with the scoop, I examine the pupil carefully and should there be any cortical matter left or shreds of capsule visible I gently introduce a pair of forceps and endeavour to remove them. It is of no use and, in my hands, has invariably ruptured the vitreous—a matter which I will again refer to. I have never seen any benefit.
derived from friction on the closed lids. I once performed a secondary operation for the removal of fragments in a case where I found the pupil blocked on the third day although the pupil had been fairly clear after the extraction of the lens. Severe iritis had set in but I was able to remove sufficient cortical matter (now rendered white and plainly visible by the action of the aqueous humour) to give the patient a fair pupil and to check the iritis. He ultimately recovered with some vision.

Accidents

The accidents which may occur during the operation of extraction are sometimes unavoidable, though of course less liable to happen in accomplished hands. They of course are due either to the operator or to the instruments or to the patient. Those attributable to the operator are probably due either to the want of skill or dexterity and need not be further discussed. I have already mentioned the accidents liable to arise from the use of faulty instruments and need now only refer again to puncture of the iris in suturing the point of the knife. When this happens I always with draw the knife.
and reintroduce it clear of the iris, and
I have never found any harm result
from it. The conditions on the part of
the patient which increase the difficul-
ties and thereby indirectly lead to ac-
cidents in the course of the operation
are more especially a high forehead,
a deep sunk eye, a small cornea at the
anterior chamber, and finally the fact
that the patient takes chloroform badly
and struggles or strains or is sick dur-
ing or immediately after the operation.
The next accident which is liable to
occur is the catching of the iris by the
point of the knife in crossing the anterior
chamber. This is most likely to happen
where the chamber is shallow or where
the puncture has been so managed
that some aqueous humour is lost. It
is not a very serious matter further
than that it endangers the ultimate
symmetry of the pupil and may
cause some haemorrhage at the time.
It has not very often occurred to me
but when it has I have been in the
habit of partly withdrawing the knife
and endeavouring to pass it clear.
Of the iris. The iris may also be cut when the knife is cutting its way out. I notice that this is much more apt to happen where the incision is low. The iris coming forward as the aqueous humour escapes. As the part of the iris cut is a piece which would in any case be excised it is a matter of no consequence as a rule. It is however liable to give trouble by causing haemorrhage and in one case, partly from this cause and partly from not having toothed iris forceps, I was unable to perform iridectomy.

I have already alluded to accidental dislocation of the lens while using the picker and to rupture of the vitreous before the lens has been extracted.

Rupture of the vitreous may occur immediately after the removal of the lens, especially if the patient is not fully under the influence of chloroform, or it may occur during the removal of fragments. When the lens is followed by vitreous I am in the habit of wiping the eye, hastily looking at the pupil and if it is clear, closing the eye with a pad and bandage as quickly as possible. In cases where the rupture
of the hyaloid membrane occurs during the process of removing fragments. The loss of vitreous is not usually so great and I think it may do good by removing fragments with it. A low incision followed by the loss of vitreous in this manner is very apt to cause a protrusion of the iris which gets caught in one of the extremities of the wound. When this occurs I think it is best to remove the protruding part with scissors and free the remainder with a probe, but if spasmodic action is going on it is better to close the eye at once and leave the iris for future treatment. I wish to record an accident which has occurred to me twice, as I believe it to be of some rarity—I refer to the spontaneous expulsion of the lens in its capsule. In the first case I had just performed the iridectomy and taken the probe in my hand when, apparently from ocular spasm, as there had been no general straining, the lens was slowly expelled from the eye in its capsule, followed by some vitreous.
The eye was at once closed and the case did very well. In the second case the patient struggled and coughed after the incision was completed and the lens was expelled in its capsule. Before iridectomy was performed, it was followed by a gush of vitreous. I performed iridectomy and closed the eye. This case also did well. There can be no doubt that the accident was caused in actual case by straining.

After concluded the operation treatment I am in the habit of putting a drop of a four grain solution of atropine into the eye, then I apply a pad and bandage and place the patient in bed and have him carefully watched until he has recovered consciousness. I have latterly painted the eyelids with vaseline and extract of Belladonna which I believe is valuable as it prevents the lids from sticking and is soothing. As a rule the patient lives on milk for the first day and eats no medicine unless he complains of pain when a grain of opium is given at night.
When the patient is a Hindu and more especially if he is of good Caste his food for the first few days often gives great trouble. High Caste people as a rule will not eat their usual food even when they are ill, without first washing themselves and then going to a place specially purified. For this reason I have known patients live on parched grain for a few days after the operation until they are permitted to leave their beds and eat their usual food after the proper ceremonies. I am in the habit of allowing patients stimulants when they refuse to take proper nourishment in bed. I am not quite decided as to the best time to examine the eye. I have sometimes opened it one day and sometimes not for three days after the operation. The absence of pain and of swelling of the lid is not a certain indication that all is going on well, if it were, I think it would be better simply to glance at the eon the second day (forty-eight hours) after the operation. This gives
a better chance of good union of the wound and lessens the danger of iritis. I have a case in hospital now where the man never complained of pain and where there was no swelling of the lid. Which was looked at daily but when I raised the lid there was intense iritis, the patient had no vision and I could not distinguish the pupil. I at once began active treatment though I feared it was too late, but thanks to belladonna and repeated blisters the iritis has been subdued, the pupil is distinctly seen though some what hazy, the patient can see a hand and vision will probably improve. At Furunkhābad where I was in the habit of opening the eye after forty eight hours, in ordinary day light, I met with a good deal of iritis. I had no darkened room for eye cases there and was in the habit of using a simple triangular bandage fastened on with tapes, with an ordinary pad over the eye. This was so easily undone.
that the patients need occasionally to remove it and test their vision. It was also somewhat liable to slip and I have discarded it as being too dangerous. From my own experience, therefore, I have learned the value of keeping patients in a darkened room and of being very careful not to expose the eye to undue light at first. I think it best to open the eye in a darkened room 48 hours after the operation, if there is no indication for opening it sooner and to satisfy myself with a glance at the sclerotic, the cornea and the pupil, to ask the patient if he can see light and perhaps a hand waved before the eye and then to shut up the eye again. In cases where all is going well I generally make a more minute examination on the following day. I ask the patient to look down before opening the lid so that I may see the condition of the wound, as well as that of the pupil. The patient's vision is then tested with fingers and if
This examination is satisfactory. I confidently predict a successful result. In cases where there is pain or even continued uneasiness, especially if accompanied by swelling of the lid, I think an examination of the eye should be made sooner, and the cause, if possible ascertained. The cause may be simply blood diffused into the anterior chamber, in which case I believe it is best to leave it alone to become absorbed, merely being prepared for a mild attack ofiritis, by increasing the strength of the atropine solution or by repeating the painting of the lids. In cases where a slight film of capsule becomes apparent, I follow out the same treatment. I have had several such cases where the capsule has eventually become absorbed and good vision has been the result. Recovery is generally slow in those cases and the conjunctiva and sclerotic are usually hyperemic— a condition which medicines as a rule have very little control over.
In the habit of applying a small blister to the temple in obstinate cases and sometimes of giving Mercury or Iodide of Potassium. A similar condition of the sclerotic and conjunctiva is sometimes kept up by the iris being caught between the lips of the wound. This also leads to the pupil being displaced upwards. I am in the habit of persevering with atropine in those cases but unless there is actual prolapse I do not touch the iris. In one case where there was a large prolapse I opened the wound at the site, drew the iris very slightly forward with forceps and cut it off as near the sclerotic as possible. This was followed by an improvement in the condition of the eye. In cases where the pupil is blocked either by lymph or by cortical matter entangled in the capsule I have seen very little good result, even from the most active treatment. The most reasonable plan is to wait till the irritation has ceased, open the wound and remove the offending matter, in one case I did this with success but it is
an operation of very great difficulty. In those cases as well as in cases of sloughing of the cornea, hoppy-head fomentations give great relief. Where funds permit, I give patients glasses on discharging them, but I have never had the means of testing their vision accurately. I have sometimes seen patients return a few days after they left hospital, with some sclerotic redness and complaining of pain in the eye. This has invariably been the result of premature exposure of the eye to bright light contrary to the advice they received on leaving the hospital. This mild inflammation has always gone down after a few days' care and treatment. With this exception, so far as my experience goes the benefits which the patient derives from the operation are invariably permanent.

I am aware that there is much to be desired before the treatment of this disease can be considered satisfactory, but it must be remembered that the means for the performance of operations generally in India, are much simpler than they are in a
Hospital at home. The conditions under which the work is done make this a necessity. The Dispensary is only a part of the Civil Surgeon's work; he has many other important duties besides. I need only mention the superintendence of the Jail where he often has the management of from four to six hundred prisoners, medical-legal work involving about one hundred post-mortem examinations in the year, besides private practice and the general supervision of Branch dispensaries &c. The general work of a Dispensary is also large compared to the means employed, about one hundred out-patients are seen daily and thirty in-patients attended to by the Native Assistant in charge, whose duties are much those of a house Surgeon. But perhaps the best test of the means at the disposal of the Surgeon is the fact that the total expenses of an institution doing this amount of work do not average more than £400 or £500 a year.

Conclusion

In Concluding this thesis I wish to remark on the immense care
and anxiety which attention to ophthal-
mic surgery demands. My duties as
an Indian Surgeon – in the operating
room and in the jail, in the dead house
and in the witness box, in peace and
in war – have been varied and often
absorbing but the nearest anxiety
has always been Called for during
the treatment of Cataract Cases. This
is partly incidental to the nature of
the work but is in great measure
Caused by some want of Experience
by faulty instruments and by defec-
tive means of treatment. I hope how-
ever, during my visit to Europe this
Summer to make a special study
of this Subject and to return to India
with a wider Knowledge of the Subject
and with a stock of instruments
which will enable me to undertake
ophthalmic work with more Confi-
dence and desiderity and to review
it with less Cause for anxiety and
regret.