

SPONTANEOUS RUPTURE OF THE ANTERIOR CAPSULE OF A HYPERMATURE LENS

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As early as 1764, Morgagni, the famous anatomist wrote in his book "The seats and causes of disease" about hypermature cataracts in the elderly. This is a type of hypermature cataract which is still known by his name—the Morgagnian cataract.

In 1900, Gifford described four cases of hypermature cataract resulting in "spontaneous cure". Of these, only one retained vision and the other three were blinded by secondary glaucoma. Since this description there were scattered reports in the ophthalmic literature of spontaneous rupture of the anterior capsule of the hypermature cataract, with expulsion of the contents of the lens into the anterior chamber. However, lens induced uveitis and secondary glaucoma due to hypermaturity gained some prominence in recent reports.

In 1948, Sugar reported three cases of glaucoma following rupture of the lens capsule. In 1953 Hubbersty and Gourlay described 4 cases of rupture of the anterior lens capsule, 3 of which presented as pseudo-hypopyon with raised intraocular tension as a result of the flow of liquified cortex into the anterior chamber, and one with the nucleus expelled into the bottom of the anterior chamber.

CASE REPORT

B. B., a Malay female, age 50 years was first seen at the Ophthalmic Department, General Hospital, on the 18th. January 1963 with a history of defective vision of her left eye associated with discomfort for 2 weeks.

On examination she had visual acuity of V. R., hand movements V.L. perception of light.

Her right eye was normal with good projection of light except for a dense almost matured cataract.

Her left eye was slightly congested and tender. The anterior capsule of the lens was ruptured and the nucleus was seen suspended at the pupil (figures I to iii). The tension was normal. Slit lamp microscopy showed a few cells in the anterior chamber and no other abnormality.

She was admitted for removal of the nucleus, and was given local steroids and $\frac{1}{2}\%$ pilocarpine eye drops to the left eye every 6 hours.

The eye was examined daily and no change or increased tension was seen.

On 24th. January, the nucleus was removed through a superior limbal section with a von Graefe's cataract knife extending for about $\frac{1}{3}$ of the circumference of the limbus, after a pre-placed suture was inserted.

A small peripheral iridotomy was done and the nucleus of the lens removed without difficulty with a vectis, which was inserted behind the nucleus and lifted it gently against the posterior surface of the cornea in order to manoeuvre it out through the section. The pre-placed suture was tied and air was injected into the anterior chamber.

The post-operative period was uneventful.

On the 4th. February, a right simple intracapsular extraction of the lens with peripheral iridotomy and the use of alpha-chymotrypsin was done without difficulty. Except for a mild striate keratitis which persisted for three days, the post operative period was uneventful. She was discharged on the 15th. February.

On the 19th. March, a refraction was done and the findings were as follows:

right: $\frac{+4.50 \text{ diopres sphere}}{+4.00 \text{ diopres cylinder, } 165^\circ} = 6/9$

left: $\frac{+7.00 \text{ diopres sphere}}{+2.50 \text{ diopres cylinder, } 175^\circ} = \text{counting fingers at 3 metres.}$

The cause of defective vision of her left eye was found to be due to simple (primary) optic atrophy of unknown etiology.

DISCUSSION

Hypermaturity of cataracts will probably become a progressively important problem because of our aging population. Although preventable, it was not infrequently seen: often it was due to neglect and sometimes the deliberate refusal by an elderly patient to have an operation because the other eye is seeing well.

Hypermaturity leads to a variety of complications which are often severe and result in blindness. These include spontaneous dislocation of the lens, glaucoma due to intumescence of the lens, lens induced uveitis or phacolytic glaucoma due probably to minute leak of the lens capsule, a definite anterior rupture of the lens capsule resulting in pseudo-hypopyon of cortical material or the nucleus being expelled into the anterior chamber. Rarely, such a hypermature cataract is cured spontaneously by gradual absorption without complications, probably as a result of minute posterior capsular ruptures.

Anterior rupture of the capsule with expulsion of the lens matter is rare. Only a few cases have been reported in the ophthalmic literature. The clinical picture after rupture depends largely on the site and the size of the rupture, and the contents of the lens. A rupture of the anterior capsule of a hypermature intumescent or Morgagnian cataract will result in the milky homogenous fluid cortical matter with numerous cholesterol crystals flowing into the anterior chamber often causing a secondary glaucoma. It presents with the signs and symptoms of acute congestive glaucoma, with pain, congestion, headache, and raised intraocular tension. It also presents a pseudo-hypopyon. The diagnosis is generally not difficult, although it may appear superficially to be an intraocular infection with hypopyon. A paracentesis is often useful not only for diagnostic purposes, but also for lowering the raised tension.

A rupture of the anterior capsule of a hypermature cataract where the liquified cortex has been absorbed leaving only a shrunken nucleus will result in expulsion of the nucleus into the anterior chamber. In a report of four cases, Hubbersty and Gourlay (1953) described one such case.

This case report is of particular interest not only because it is rare for hypermature cataracts to present with rupture of the anterior capsule resulting in the expulsion of the nucleus into the anterior chamber, but also because there is no record in the ophthalmic literature of an expelled nucleus being caught and suspended at the pupil!

Since Hypermaturity of a cataract is often a cause of serious complications and is preventable by early operation, it is emphasised that it becomes the duty of ophthalmologists to take deliberate steps to prevent cataracts from reaching that stage. Duthie has advocated operating on both cataracts simultaneously in these cases,

to prevent the frequent refusal for further operation after the vision of one eye has been restored. The author does not consider this the answer to the problem as simultaneous operations expose the patient to the danger of post-operative complications occurring in both eyes together with possible disastrous results.

Once the stage of hypermaturity is reached, it becomes necessary to remove the lens as soon as possible. The author stresses that the time required for a cataract to develop to hypermaturity varies considerably and since the stage of maturity merges into hypermaturity without any change in its symptoms, too often the patient with hypermature lens presents only after complications have become established. It follows that the only effective way to prevent these complications is to anticipate the complications and to remove the lens early. In fact, as early as 1900, Gifford stressed the importance of prevention of hypermaturity of cataracts by early treatment.

TREATMENT

Despite the knowledge of the dangers of hypermature cataracts, time and again this important problem presents to the ophthalmologists. The treatment depends largely on whether there is an associated complication.

1. *Hypermaturity without complication*

The lens should be removed as soon as possible. The method of extraction is usually intracapsular, but is partly dependent on the type of hypermaturity.

- i. Intumescent cataract. This has to be differentiated from intumescence due to a maturing cataract. In both cases the anterior chamber is narrowed as a result of increase in size of the lens. In the former the cortex is a homogenous white fluid with no iris shadow, compared to the irregular radial opacities of the latter, usually with an iris shadow.
- ii. Morgagnian cataract. The cortical substance has liquified and the small nucleus has sunk to the bottom of the lens. Its appearance varies depending on the amount of liquified cortex and this in turn is probably related to the degree of capsule permeability.
- iii. The hypermature cataract with shrunken nucleus. This is due to absorption of the liquified cortex, leaving a hard shrunken disciform nucleus.

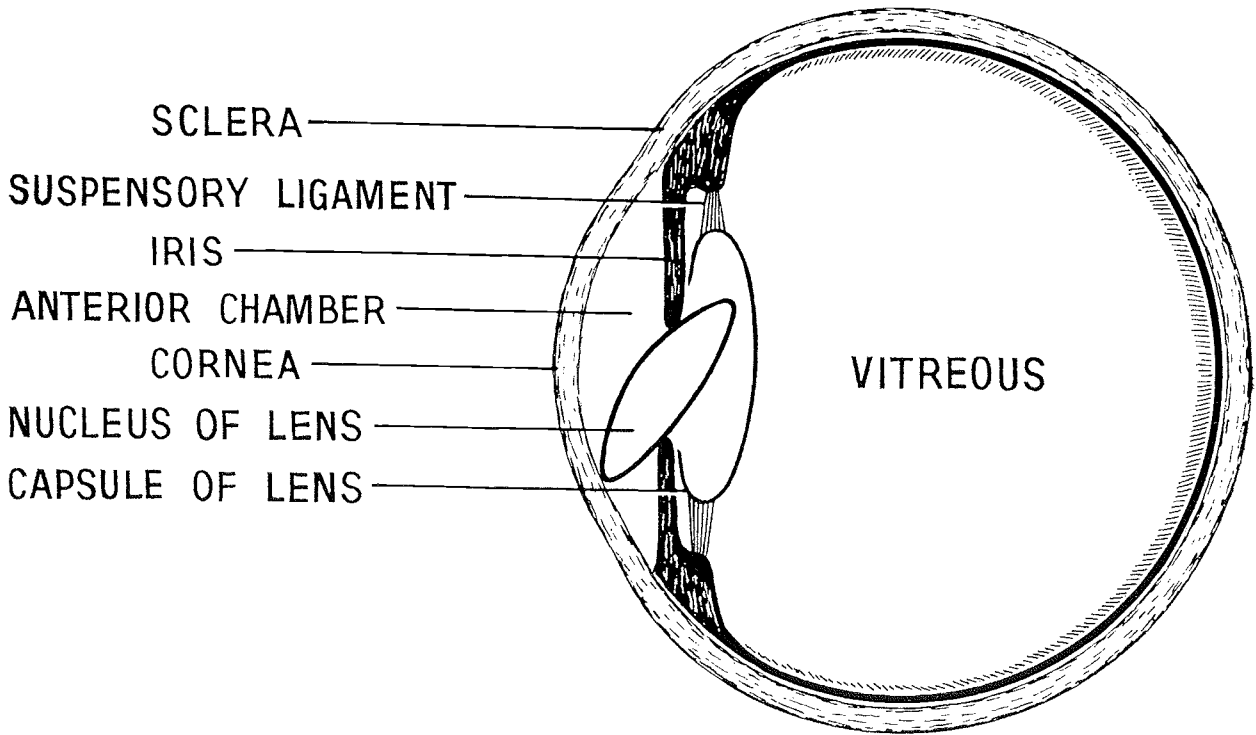


Fig. 1.

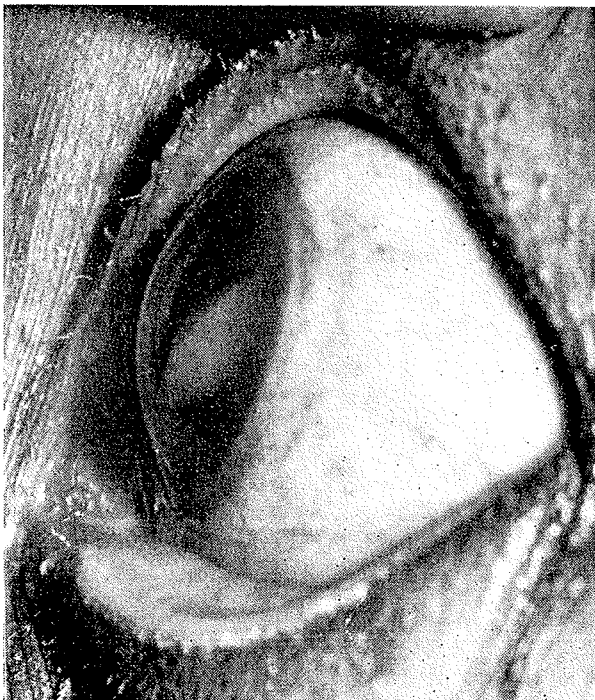


Fig. 2.

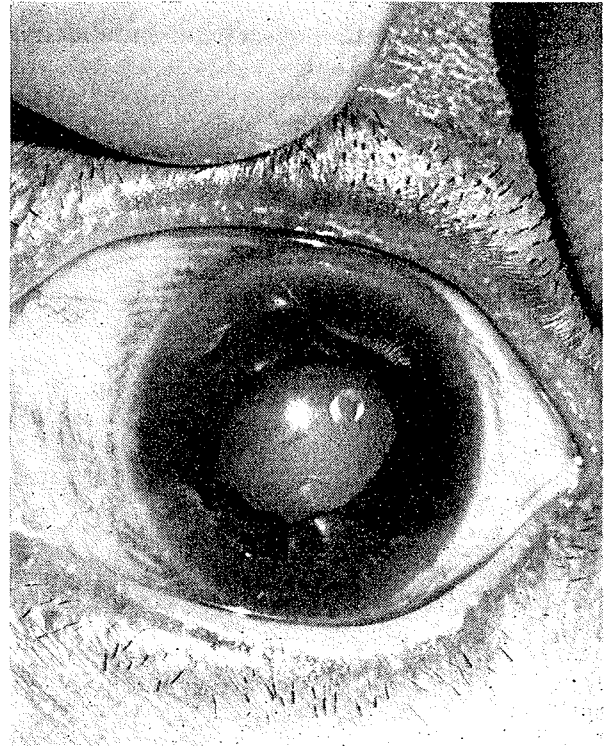


Fig. 3.

Figures 1 — 3 show the nucleus of the lens being suspended at the pupil.

Of these, the intumescent cataract is probably the commonest. As already stated it is important to exclude intumescence due to a maturing cataract. In the latter, the suspensory ligament is often strong, as compared to the former where it is weak and intracapsular extraction performed without difficulty. However, the section should be fully 180° and because of the tenseness of the capsule, it is generally not possible to grip the capsule with intracapsular forceps. Several techniques are used to overcome this difficulty. The author has found the following very practical and easy:

- i. The capsule can be punctured with a fine needle at the site where the forceps will be applied later. The lens material will flood the anterior chamber, which should be washed out before application of the forceps. The intralenticular tension will be reduced and the capsule can be grasped over the site of puncture to prevent further loss of lens material during extraction.
- ii. Another technique is to apply the erisophake over the site where the forceps will be applied later. This will often elevate a knuckle of capsule sufficient for it to be grasped by the forceps.
- iii. Alternatively, the lens can be removed solely with the erisophake. The author prefers this technique, but for ophthalmologists who do not use this instrument it may be wise to avoid this technique.

Excellent results can also be attained with extracapsular extraction, the main disadvantage is the possible post-operative development of a lens induced uveitis.

The Morgagnian cataract and the hypermature cataract with shrunken and hardened lens usually can be extracted intracapsularly with the erisophake without difficulty.

2. *Hypermaturity with Complications*

The most common complications are glaucoma and uveitis. In both cases the complications should be treated urgently by the usual methods of lowering the intraocular tension, with intravenous urea if necessary and the uveitis controlled with steroid therapy. In both cases, since the source of complication is the hypermaturity, the lens should be removed as soon as it is safe to do so. Posterior dislocations

are best left alone and in anterior dislocations there is no choice except to remove the lens at once.

When the capsule is ruptured anteriorly and a pseudo-hypopyon of liquified cortical material floods the anterior chamber, a paracentesis should be done urgently to lower the raised tension and to remove the lens material. Alternatively a small limbal section may be necessary to enable the removal of the nucleus, which is generally small in these cases. Similarly, if the nucleus is expelled anteriorly into the anterior chamber, it should be removed through a small section at the limbus. The author found a small vectis very useful for scooping the lens gently against the posterior surface of the cornea in order to manoeuvre it out of the wound. The technique used in this case presented no difficulty at operation and there were no post operative complications.

SUMMARY

1. An extremely rare case of anterior rupture of the capsule of a hypermature cataract resulting in the expulsion of the nucleus which was caught and suspended at the pupil was described.
2. The types, complications and treatment of hypermature cataracts were briefly discussed with special reference to the case report.
3. The author stressed the importance of prevention of hypermature cataracts by early removal when hypermaturity is anticipated as the only definite method to prevent its serious complications: and if hypermaturity without complications presents to ophthalmologists, the lens should be removed as soon as possible.

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