

AN ASSESSMENT OF BURIED SILK SUTURES IN LENS SURGERY

MAURICE H. LUNTZ, F.R.C.S., *Cape Town*

The first recorded lens extraction was performed by the French ophthalmologist, Daviel, in 1745 (quoted by Stallard³). Since that time surgeons have continually striven to make this procedure safer. One of the most significant advances in this respect has been the use of sutures to close the limbal wound.

Williams, in 1867,⁴ was the first to use a corneal suture. Little interest was shown in this idea for many years, for two main reasons. These were: the lack of the very fine needles and silk required, and the reluctance to prolong an operation which was already full of hazards on account of the lack of orbicularis and retrobulbar akinesia. It was only in the 1930s that Stallard,³ Lindner,⁵ Verhoeff⁶ and Maclean⁷ revived interest in corneal suture after lens extraction. The main advantage of this is the security afforded by adequate closure of the limbal section which, in the intracapsular method, occupies 180° in the upper half of the limbus. In the extracapsular method it is rather smaller. On the other hand these sutures have to be apposed with the greatest accuracy otherwise serious complications can result, e.g. a flat anterior chamber, secondary glaucoma, delayed wound healing, anterior chamber fistula, epithelial downgrowth, and high astigmatic correction. One to nine interrupted corneo-scleral sutures are used, depending on the individual surgeon.

There are a large number of technical variations but, broadly speaking, 'exposed' sutures fall into 2 major groups:

1. *Pre-placed corneo-scleral sutures.* The suture is placed in a groove cut into the limbal sclera for half its thickness, at the 12 o'clock meridian, before making the cataract section. The 2 arms of the suture are pulled out of the groove and separated, and the section is then made between them. In this way the wound edges are very accurately apposed when the suture is tied.

2. *Post-placed corneo-scleral suture.* The section is first cut and then the suture placed. A limbal-based conjunctival flap may be fashioned if so desired. The sutures are inserted, first through the corneal side, the needle passing through half the corneal thickness, and then through the scleral side, taking great care to achieve accurate apposition.

These 'exposed' sutures have 2 great disadvantages: (a) they irritate the eye postoperatively; and (b) they have to be removed after 10 days, a potentially dangerous procedure which has spoilt a good operation in many cases.

Recently Barraquer¹ introduced a technique using very fine silk sutures (Belgian virgin silk) which are post-placed and tied under the conjunctival flap and left there. They are completely non-irritant, and are not removed. Over a period of a few months they work their way out silently through the conjunctiva. Because of these advantages, I believe this technique should replace existing methods. The results, when using these sutures, are as good as with 'exposed' sutures. An analysis of the results of 75 unselected cases, treated by this method from November 1957 to November 1958, is given below and, in my opinion, proves its superiority to the older forms of treatment. All these operations were performed by me at St. Mary's Hospital, Paddington, London; as a control the results, using more classical techniques at Groote Schuur Hospital,² Cape Town, are quoted.

MATERIAL AND METHOD

The cases were selected at random so that they included senile, traumatic, secondary, complicated and uni-ocular cataracts. A minimum 3-month period between operation and follow-up was allowed in all cases.

In the St. Mary's Hospital series of 75 cases, 65 had accurate refractions recorded at the time of the follow-up. These refractions and assessments of postoperative visual acuity were all done at a refraction clinic by independent observers, and not by myself.

In the Groote Schuur Hospital series, there were 100 cases taken at random from the European ward only, to rule out any possible racial differences. Forceps were used in 85 cases, an erisophaeke in 13 and a vectus in 2. Refractions and assessments of postoperative visual acuity were done in the out-patient clinic. Sutures were used on all cases but no buried sutures were used. The operations were performed by 12 surgeons, 2 of whom were on the resident staff.

TECHNIQUE USING BURIED SUTURES

The same technique was used in placing the buried sutures in all cases. It was decided that, theoretically, 3 well-placed sutures should be sufficient to close the limbal wound adequately, and this number was employed in all cases.

Anaesthetic

Local and general anaesthesia was used at random. In one case where local anaesthesia was used, vitreous was

lost due to the restlessness of the patient. There were no complications when general anaesthesia was used, and this was by far the pleasanter method both for the surgeon and the patient.

Type of Extraction

In all but one of the cases the section and flap was cut with a Graefe knife in the upper half of the limbus. In one case the section was made in the lower half, since an operation for iris inclusion had been done previously. Three post-placed virgin silk sutures were inserted at the 10 o'clock, 12 o'clock and 2 o'clock positions. A peripheral iridectomy was then done in all but one case — here tough posterior synechiae demanded a broad iridectomy. Capsule forceps were used to extract the lens in all except 6 cases (8%) where a motor-controlled erisophaeke was used. No

TABLE I. TYPE OF CATARACT EXTRACTION

Type of extraction	St. Mary's*	Groote Schuur**
Intracapsular	80%	63%
Extracapsular	20%	37%

* St. Mary's Hospital series.
** Groote Schuur Hospital series.

difference was noticed in the results. Alpha-chymo-trypsin was used in only 1 case with a good result.

An intracapsular extraction was attempted in all cases; this failed in 15, i.e. in 20% (Table I).

When the lens had been removed the sutures were tied and the conjunctival flap was stroked into place over them.

Postoperative Management

Double pads were placed over the patients' eyes and all patients were put to bed. The first dressing was done by the ward sister after 24 hours, at which time 1 eye was uncovered and the patients were allowed to get up. In intracapsular extractions pilocarpine drops were used on the operating table and for 3 days postoperatively. In failed intracapsular extractions atropine drops were used initially.

RESULTS

1. Visual Results

For the sake of comparison these were assessed on an arbitrary scale: 6/6 or better was rated as 1, 6/9 as 2 and so on up to 6/60 as 7. Ability to count fingers was

TABLE II. COMPLICATIONS IN THE 2 SERIES OF OPERATIONS

Complications	Incidence	
	St. Mary's*	Groote Schuur**
None	89.6%	57%
Hyphaema	2.6%	29%
Vitreous haemorrhage	Nil	2%
Vitreous loss	2.6%	2%
Choroidal detachment	2.6%	2%
Anterior chamber leak	1.3%	Nil
Retinal detachment	Nil	3%
Retinal and choroidal detachment	Nil	1%
Prolapsed or incarcerated iris	1.3%	4%
Average astigmatism	+ 2.0 D	+ 1.87 D

* St. Mary's Hospital series.
** Groote Schuur Hospital series.

8, seeing hand movements was 9, perception of light was 10, and a blind or lost eye was 11.

The average visual result at St. Mary's Hospital was 2.2 (about 6/9) and at Groote Schuur Hospital it was 3.1 (about 6/12).

2. Analysis of Complications

Complications in the 2 series are compared in Table II. In the St. Mary's Hospital series 89.6% of cases were entirely free of complications and in the Groote Schuur Hospital series, 57%. This difference is attributable to the high incidence of hyphaema in the Groote Schuur Hospital series. This generally resolves without serious sequelae.

DISCUSSION

The results in both series are comparable. There are no statistically significant differences apart from the much lower incidence of hyphaema, prolapsed iris and retinal detachment in the St. Mary's Hospital series. As the incidence of hyphaema is related to wound healing, this may be connected with the type of suture used. However, so many other factors are involved, e.g. the use of a conjunctival flap, the use of a keratome and scissors or Graefe knife, that it is impossible to be dogmatic about this.

The advantages of using buried silk sutures which are safer and therefore more desirable, are:

1. The sutures are less irritating postoperatively, and also less irritating than buried catgut sutures.
2. The sutures do not require removal, which can be a trying experience for the patient and may lead to a mishap.
3. The sutures can be used with a conjunctival flap which reduces the possibility of epithelial downgrowth.

Experience with this method has also brought to light its disadvantages. These are essentially those of a post-placed suture whatever its type. Where the anterior chamber is filled with vitreous humour pre-operatively, e.g. following trauma, use of a pre-placed suture does provide better control. In these cases, which are always difficult, each surgeon must use his discretion and the technique which suits him best.

SUMMARY

The advantages of using post-placed buried sutures are stressed. By comparing a series where these are used with a control series using 'exposed' sutures, it is shown that the results of this method are comparable with those where 'exposed' sutures are used.

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