

# Long-term follow-up of lid surgery for trichiasis in the Gambia: surgical success and patient perceptions

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## Abstract

**Background** Surgery is an important component of the SAFE strategy which has been shown to improve visual acuity. There are limited data on long-term surgical success and patient perceptions and satisfaction. A sample of patients from the Gambia who had undergone previous lid surgery for trichiasis were therefore examined for recurrence of trichiasis and interviewed for patient satisfaction.

**Methods** Health centre surgical records and community screening were used to identify patients who had undergone previous lid surgery. Consenting patients were examined and a questionnaire administered.

Kaplan–Meier survival plots were constructed for recurrence of trichiasis.

**Results** Sixty-five subjects were recruited. Median age at surgery was 50 years. Median time since surgery was 7 years. Fifty-two of 115 (45%) operated eyes were free of trichiasis at follow-up and 23 of 65 (35%) patients had not suffered recurrent trichiasis in an operated eye. Median time from surgery to recurrence of trichiasis was estimated as 10.0 years (95% CI 3.7–16.3). Recurrent trichiasis was not significantly associated with visual impairment or blindness at follow-up. The following patient perceptions were reported: satisfaction with surgery (88%), less discomfort than before surgery (93%), improved vision (83%), work easier (38%), worth the expenditure (94%), would recommend it to others (93%), had recommended it to others (38%), experienced intra-operative pain (26%) and experienced post-operative pain (26%).

**Conclusion** Factors affecting surgical success, including surgical technique and re-exposure to infection, are discussed. This study provides important preliminary data for programme planners but larger prospective studies are required.

**Key words** Eyelid surgery, The Gambia, Trachoma, Trichiasis

Trachoma is a chronic conjunctivitis caused by *Chlamydia trachomatis* which has sight-threatening complications such as trichiasis and corneal scarring. It remains the world's commonest form of preventable blindness, mainly affecting disadvantaged communities. The World Health Organization has estimated that 146 million children and adults have active inflammatory trachoma and an additional 10 million people have trichiasis and are in need of urgent surgery.<sup>1</sup>

The World Health Organization is promoting the Global Elimination of Trachoma as a blinding public health problem by the year 2020 (GET 2020) and has endorsed the SAFE strategy: Surgery for entropion and trichiasis, Antibiotic treatment for active infection, and the promotion of both Facial cleanliness and Environmental improvement to reduce transmission, in order to achieve this goal.<sup>2</sup>

Surgery is the one component of the SAFE strategy which has been shown to result in improved visual acuity. A randomised controlled trial in Oman found that lid surgery for major trichiasis (defined as more than 5 lashes abrading the globe) produced significant improvement in visual acuity compared with non-operated eyes.<sup>3</sup> The trial found bilamellar tarsal rotation (full-thickness transverse lid split and eversion of distal fragment using mattress sutures) to be the most effective treatment with a success rate (absence of trichiasis and adequate lid closure) for major trichiasis (5 lashes or more involved) of 77% with follow-up of 9–21 months.<sup>3</sup> The bilamellar tarsal rotation has been the procedure recommended by the World Health Organization since 1993.<sup>4</sup> The other commonly practised technique is the tarsal rotation procedure, similar to the bilamellar procedure except that the transverse lid split does not include skin or orbicularis muscle. It is the standard procedure in the Gambia and widely used throughout Africa. It was reported as successfully performed by a trained ophthalmic nurse in Tanzania with success rates of 81% (95% CI 74–88) at 24 months and 79% (95% CI 71–87) at 36 months.<sup>5</sup>

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Data about the longer-term success of trichiasis surgery would be useful to eye care programme planners in estimating future surgical caseloads but have not previously been reported.

For the past 10 years, the Gambian National Eye Care Programme has provided trichiasis surgery on a weekly basis in two major health centres and two hospitals, distributed throughout the country. Outreach surgery is also performed from these centres in at least two rural health centres on a monthly basis. The standard operation fee is 25 dalasis (approximately \$2.5) which is a fixed government levy paid by the patient to the hospital or health centre funds. Surgery is performed by both medical staff and senior ophthalmic medical assistants (who have had 3 years basic training, a 1 year ophthalmic nursing course and 2 years more clinical and surgical training). Surgery is usually performed as a daycase procedure with follow-up at 1 week.

In addition to the lack of information about long-term outcome of surgery, little is known about patients' perception of the operation and their satisfaction with it. Non-compliance with surgery is known to be a problem both in the Gambia and elsewhere<sup>6,7</sup> and patient satisfaction may be an important factor in this. We therefore interviewed and examined a sample of trichiasis patients who had undergone surgery over the last 10 years in the Gambia.

## Methods

### *Subject selection and recruitment*

Three geographic divisions from the Gambia were chosen for sampling: Western, North Bank East and Lower River Division. In national surveys conducted in 1986<sup>8</sup> and 1996<sup>9</sup> these divisions contained the highest prevalence of both active trachoma and trichiasis. Subjects were recruited from two sources. Firstly, patients were traced from records from all surgical centres in these divisions. Secondly, community screening was carried out in 47 villages from the three divisions. Villages were selected on the basis of size and logistical convenience. Village health workers, village heads (alkalos) and traditional birth attendants were involved in publicising the screening and all patients who had undergone previous lid surgery were asked to attend a central compound. Eligibility for recruitment required two of the following three criteria: (1) written record of surgery from health centre kept by the patient, (2) history of lid surgery for trichiasis, (3) signs of previous lid surgery for trichiasis on examination.

### *Informed consent*

All patients eligible for enrolment in the study were then briefed in an appropriate local language about the purpose and procedures of the study, after which their consent was sought for enrolment. After interview and examination, patients requiring further surgery were referred for surgery if they agreed to it.

## *Interview and examination*

A basic questionnaire was administered to subjects covering accessibility to surgery, cost and patients' perceptions of surgery and its effect on their life. It was devised using information from (1) previous published literature on cultural attitudes towards eye disease, (2) focus groups and a semi-structured in-depth interview of trichiasis patients about trachoma and its treatment and (3) key informant interviews – informal interviews with community ophthalmic nurses, senior ophthalmic medical assistants and National Eye Care Programme managers. Sample interviews were taped and the transcripts translated back into English to validate translation by the fieldworker.

Clinical examination was performed by an ophthalmologist (R.J.C.B.) and included torchlight and  $\times 2.5$  magnification for classification of trachoma. Lids were everted for assessment of active disease where possible. Patients living near enough to a microbiology laboratory to allow same-day incubation had conjunctival swabs taken for bacteriology. Visual acuities were measured at 6 m outside in daylight with a standard E Snellen chart. The World Health Organization definitions of visual impairment (visual acuity between 6/24 and 3/60 in the better eye) and blindness (visual acuity worse than 3/60 in the better eye) were used.

Where surgical records were not available, patients were asked to estimate how many years ago their surgery was performed and those with recurrent trichiasis were asked when the symptoms returned. In those who had undergone surgery twice or more in the same eye, time to recurrence after the first operation was used. Patients' estimates of time to recurrence were used to construct a survival curve based on the methods of Kaplan and Meier with censoring of those patients found to be trichiasis-free at follow-up. Factors influencing survival time were tested for significance using the logrank method.

## Results

### *Subjects*

Health centre surgical records with addresses were available at two health centres and 24 patient records were identified of which 10 were successfully traced, the remainder having moved or died. Community screening identified 55 eligible patients. All patients agreed to take part, giving a total of 65. Median age was 60 years (range 18–90 years). Forty-eight (74%) were women and 17 (26%) were men. Forty-six (71%) came from Western Division, 16 (24%) from North Bank East Division and 3 (5%) from Lower River Division.

### *Surgery*

Fifty patients had undergone bilateral surgery and 15 unilateral (a total of 115 eyes). Median age at surgery was 50 years (range 6–80 years). Thirty-three patients (51%) had surgery performed at the main hospital in the capital

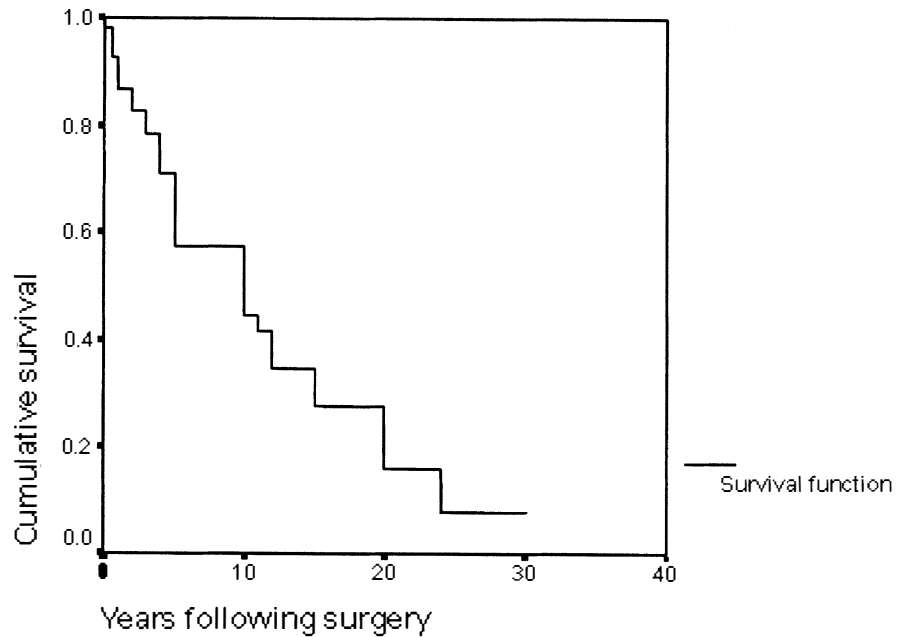


Fig. 1. Survival plot of time to recurrent trichiasis.

city, 23 (35%) had surgery performed in major health centres or their outreach points and 9 (14%) had travelled to a neighbouring country (either Senegal or Guinea-Bissau) for the surgery.

The median number of years since surgery was 7. The surgery was provided free to 22 (34%) patients and 7 (18%) were charged more than the standard rate (ranging from \$7.5 to \$18). The mean cost of the return journey to place of surgery was \$1.1 (range 0–5.6, SD = 9) and the mean return journey time was 116 min (range 4 min to 12 h, SD = 226 min). Thirty-one patients (72% of those who could remember) claimed to have had surgery within 6 months of hearing about it but 7 (16%) admitted to delaying over 5 years. Ignorance about how to obtain surgery was reported as a cause of delay by 18 patients (45% of those reporting a barrier). Other causes of delay included symptoms not being bad enough, reported by 5 patients (12%), and lack of money, reported by 4 patients (10%).

### Surgical results

Fifty-two of 115 (45%, 95% CI 36–55%) operated eyes were free of trichiasis at follow-up and 23 of 65 (35%, 95% CI 2–48%) patients had not suffered recurrent trichiasis in an operated eye.

Kaplan–Meier estimates of survival (without recurrent trichiasis) are shown in Fig. 1. Median survival time was estimated as 10.0 years (95% CI 3.7–16.3). Survival time was not affected by place of surgery, geographic division nor any other potential effector variable.

Four of 115 operated eyes (3.5%) had inadequate lid closure and corneal exposure. Three of these had central corneal opacity. No other long-term complications of lid surgery were observed.

Fifty-two of 115 operated eyes (45%) had central corneal opacity and prevalence of visual impairment was 40% (24/60) and blindness 20% (12/60). Visual impairment and blindness were not significantly more common in patients with recurrent trichiasis. Fourteen of 49 patients (29%; scarring prevented lid eversion in 16 patients) had active trachoma and bacteria were isolated from conjunctival swabs of 7 of 25 (28%). Bacteria cultured were *Streptococcus pneumoniae* (3 cases), *Haemophilus influenzae* (2 cases) and *Staphylococcus aureus* (2 cases).

### Patient perceptions

Parameters of patient satisfaction are shown in Table 1. None of these parameters correlated with recurrence of trichiasis or length of time to recurrence. Two patients were not pleased with the results of surgery and 5 were equivocal. Reasons for lack of satisfaction were persistent discomfort (2 patients), no improvement in vision (2 patients) and continuing need for epilation (1 patient). Fifteen of 57 (26%) patients experienced pain during surgery and another 15 (26%) experienced pain after surgery. Of 37 patients who were working, 9 (24%) took 1 week or less off work, 18 (49%) took between a week and a rainy season off work and 10 took a year or more off work (27%).

Table 1. Patient satisfaction with surgery

Parameter	Frequency	%
Pleased overall with surgery	51/58	88
Eye more comfortable	53/57	93
Vision better	48/58	83
Work easier	27/53	38
Worth money spent	16/17	94
Would recommend to others	51/55	93
Has recommended to others	20/53	38

## Discussion

This is the first report of long-term follow-up of lid surgery for trichiasis. Median post-operative trichiasis-free survival was 10 years and mean age at operation was 48 years. A limitation of the study is firstly the sampling process. Many operated patients were lost to follow-up. The reason for this is that most of them were from a health centre near the border with Senegal and many of the operated patients had since moved to Senegal. Little information was available about patients lost to follow-up so it is difficult to know whether their surgical results would have differed. Most of the patients recruited to the study therefore came from community screening. This screening procedure may have been prone to bias. Villages were selected on the basis of logistical constraints rather than randomly. Some operated patients may have been missed. Those who had recurrent trichiasis may have been more likely to present for screening in the hope of further help. Alternatively such patients may have become disillusioned with eye care workers and been less likely to present for screening. The strength of the sample is that it reflects the results of different surgeons operating in different parts of the country.

A second limitation resulted from the shortage of surgical records, and necessitated using patient estimates of when their surgery was performed and when trichiasis recurred. This limits the precision of the results but these are the only available data at present. The problem of inadequate surgical record keeping was highlighted by the study and needs to be addressed by the national programme to allow more rigorous audit of surgical results. This study therefore provides a rather crude estimate of long-term surgical outcome but is the only information available to programme planners at present. Larger prospective long-term follow-up studies would yield more accurate information but are expensive of time and resources.

Repeated infection has been shown to be important in development of trichomatous scarring in both animals<sup>10</sup> and humans<sup>11</sup> and may also be involved in recurrent trichiasis after surgery. In this case survival time would be affected by exposure to active disease. Prevalence of clinically active trachoma in this study was 29%, much higher than the national prevalence for this age group (0.9–1.6%)<sup>9</sup> but similar to that found in another study of unoperated trichiasis in the Gambia.<sup>12</sup> Although clinical grading was performed by an ophthalmologist experienced in trachoma, the World Health Organization grading system used has not been validated for post-operative patients. Since microbiological confirmation of the diagnosis of active trachoma was not performed it is conceivable that viral or bacterial infection may have been misdiagnosed as active trachoma. However, there was striking clinical resemblance to the World Health Organization intense inflammation (TI) grade,<sup>13</sup> validated for pre-operative patients, with a predilection

for the upper sub-tarsal conjunctiva. Furthermore there was no association between this clinical picture and bacterial isolation from the conjunctiva.

If the clinical impression of a high rate of active trachoma was correct, this might suggest that scarring predisposes to reinfection or that patients who develop scarring are inherently more prone to recurrent infection (or reactivation of latent organism) and therefore develop scarring. Previous work in the Gambia has demonstrated reduced cell-mediated immune responses to chlamydial antigens in patients with trichomatous scarring compared with non-scarred controls from similar communities.<sup>14</sup> Presence of clinically active trachoma at follow-up was not associated with recurrence of trichiasis but the study design did not allow assessment of the number of episodes of active disease since surgery. The national prevalence of active trachoma in the Gambia was 3% in 1996.<sup>9</sup> It is possible that trichiasis might recur more quickly in communities with a higher prevalence of active disease though it is interesting that the Tanzanian study estimated a 3 year survival as 79%,<sup>5</sup> very similar to the estimate from our study (78%). The prevalence of active trachoma in the community where that study was performed was not reported. If prevalence of active disease were influencing surgical results this would emphasise the importance of an integrated SAFE strategy and might mean that such an integrated strategy would be more effective than the sum of its parts. Further investigation into this area is required.

One reason for investigating long-term results of surgery is that both techniques involve complete division of the tarsal plate and hence section of the Meibomian glands. The effect of this on tear film stability and bacterial flora is unknown. Prevalence of bacterial culture positivity for conjunctival swabs was 28%, though the sample tested was small. This was similar in prevalence and spectrum of bacteria to unoperated trichiasis in the Gambia,<sup>12</sup> suggesting that section of the Meibomian glands does not affect conjunctival bacterial flora.

It is possible that better surgical results might be obtained by using the bilamellar lid rotation recommended by the World Health Organization. Although previously reported as successful,<sup>5</sup> the tarsal rotation procedure used in the Gambia and widely in Africa has not been compared with the bilamellar technique in a randomised controlled trial. The Oman trial compared the bilamellar technique with tarsal advance and rotation, a technique not in common use in community trachoma programmes because it involves delicate dissection into the fornix and posterior advancement sutures, more technically difficult than simple tarsal rotation. We recommend that the two techniques in common use now be compared in a randomised controlled trial.

In this study, neither subjects with recurrent trichiasis nor those with shorter time to recurrence were more likely to be visually impaired or blind at follow-up. One interpretation of this is that visual impairment or

blindness occurred before surgery and that patients are presenting too late. Unfortunately pre-operative visual acuity data were not available even for those patients whose surgical records were available and so this hypothesis could not be tested. The majority of patients in this study claimed to have presented for surgery within 6 months of hearing about it and ignorance about how to obtain surgery was reported as the most common reason for delay. This might suggest that, despite the outreach surgery, community awareness about trichiasis and its treatment remain inadequate. This has been recognised by the National Eye Care Programme and measures have been introduced to increase awareness with posters and radio broadcasts. In addition surgery is now provided in patients own villages, free of charge, thus increasing both awareness and accessibility.

Another influence on attendance for surgery is likely to be community perception of the effectiveness of the treatment. Patient satisfaction with this operation was reported as being high, considering that only 35% of patients had not suffered recurrent trichiasis. The fact that patient satisfaction was not influenced by recurrence of trichiasis suggests possible over-reporting of their satisfaction out of politeness. Only 38% of patients reported that they found work easier following surgery (a similar proportion to that reported in Tanzania<sup>15</sup>) and a similar proportion had recommended surgery to others. These may be more accurate indices of satisfaction but may also reflect cultural attitudes towards giving advice. A number of patients said that they were pleased with the results of their surgery but it was not their business to advise others. Patients who are pleased with surgery and keen to tell others have previously been used successfully by eye care programmes to encourage attendance for cataract surgery<sup>16</sup> and their use could also be considered for trichiasis surgery. Over half the patients interviewed remembered pain either during or after the procedure. In the context of poor compliance this illustrates the importance of training in good anaesthetic technique and of provision of post-operative analgesics.

### Conclusions

1. The median time from lid surgery to recurrence of trichiasis in the Gambia is estimated at 10 years.
2. Visual impairment and blindness at follow-up were not influenced by the presence of recurrent trichiasis or survival time, which might suggest delayed presentation for surgery.
3. Ignorance about how to obtain surgery was reported as the most common cause of delay in presentation and steps are under way to deliver the message more effectively.

4. Good anaesthetic technique and provision of post-operative analgesia are important.
5. When surgery is performed, the records should be kept of patients' addresses to allow follow-up in the community and audit of surgical results. Pre-operative visual acuities should also be recorded to enable further investigation of the effect of surgery on vision.

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