

# Results of community-based eyelid surgery for trichiasis due to trachoma

Heidrun Bog, David Yorston, Allen Foster

## Abstract

In many parts of Africa patients with upper-lid trichiasis due to trachoma have very limited access to ophthalmologists or hospital facilities. In order to reach these patients it is necessary for trained paramedical eye workers to operate on patients close to where they live. The results of trichiasis surgery performed by an ophthalmic nurse in Tanzania were evaluated. A total of 156 operations were performed on 94 patients over a 2 year period by an eye nurse in central Tanzania. One hundred and forty four eyes in 86 patients were followed for a minimum of 9 months (range 9-36; mean 25.5 months). One eye developed a wound infection and nine eyes developed minimal central notching of the upper eyelid, but without corneal exposure. Survival time analysis showed a probability of survival without recurrent trichiasis of 81% at 24 months (95% CI 74% to 88%) and 79% at 36 months (95% CI 71% to 87%). It is concluded that trichiasis surgery may be safely and effectively performed in the community by a trained ophthalmic nurse.

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Worldwide, trachoma is second only to cataract as a major cause of blindness. It is estimated that approximately six million people are blind as a result of trachoma,<sup>1</sup> almost all of them living in dry, poor areas of Africa, Asia, and Latin America.

One important control measure for preventing blindness from trachoma is lid surgery to correct the entropion and trichiasis that leads to corneal scarring.<sup>2-4</sup> Studies have shown that a number of different operations are effective in correcting trichiasis due to trachoma,<sup>5,6</sup> but these studies have usually relied on ophthalmologists to perform the surgery, which has been carried out in hospitals or health centres. In many parts of Africa patients with upper-lid trichiasis have limited access to either ophthalmologists or hospital facilities. This study was undertaken to evaluate the results of trichiasis surgery performed by a trained ophthalmic nurse working in the patients' own community.

## Methods

All operations were performed by the same ophthalmic nurse (HB). Her ophthalmic training consisted of 6 months of instruction at Mvumi Hospital eye clinic, under the supervision of an ophthalmologist (DY).

The operations were performed in 19 different villages in Dodoma Region, in central Tanzania. Most of the villages were within 40 km of eye

clinics at Mvumi and Dodoma hospitals. However few villagers were willing to travel to either hospital for treatment. This part of Tanzania is hot, dry, and infertile. The majority of the people are subsistence farmers. Trachoma is endemic, though recent improvements in health education and hygiene may be contributing to a reduction in transmission of the infection.<sup>7,8</sup>

Patients were seen at community eye clinics held in the villages by the ophthalmic nurse. All patients aged 30 years or more with five or more lashes touching the globe in the primary position of gaze were offered surgery. A small number of trichiasis patients whose age was under 30 years were taken to Mvumi hospital for posterior lamellar mucous membrane grafting. No patient in this series had preoperative lid shortening sufficient to cause corneal exposure.

The operation consisted of rotation of the distal tarsal plate according to the following procedure. Five ml of 2% lignocaine with adrenaline (1:200 000) were injected into the upper eyelid, anterior to the tarsal plate and just above the lid margin. The upper eyelid was then everted with a Cruikshank clamp. The conjunctiva and superior tarsal plate were incised parallel with, and 2 mm posterior to, the lid margin from the lateral canthus to just lateral to the lacrimal punctum (Fig 1A). A radial incision was made through the margin strip of tarsus immediately lateral to the upper punctum. The orbicularis muscle was dissected off the thickened and scarred distal tarsal plate, and the dissection was also performed superiorly to divide the levator aponeurosis from its attachment to the anterior surface of the proximal tarsal plate. Four of five 6/0 non-absorbable sutures were inserted through the skin just above the lash line into the proximal (superior) tarsal plate 2 mm above the incision, and returned back through the skin above the lash line. As the sutures are tied from the centre outwards the marginal strip of tarsal plate everts through approximately 90° (Fig 1B). It was unnecessary to advance the proximal tarsal plate with a suture through the superior fornix, as dividing the levator aponeurosis caused a slight ptosis which compensated for the lid-shortening effects of the operation. Topical antibiotic and a dressing were applied for 24 hours. The patient was instructed to apply tetracycline eye ointment three times daily for 2 weeks. The sutures were removed 1 week postoperatively by the nurse.

In villages with a dispensary or health centre, the surgery was performed in a clean room in the clinic. In other villages, the operations took place in a room of the village council. No operations were performed in a hospital or operating theatre.

Patients were followed up at 1 month, and at

Bugiri Eye Clinic,  
Dodoma, Tanzania  
H Bog

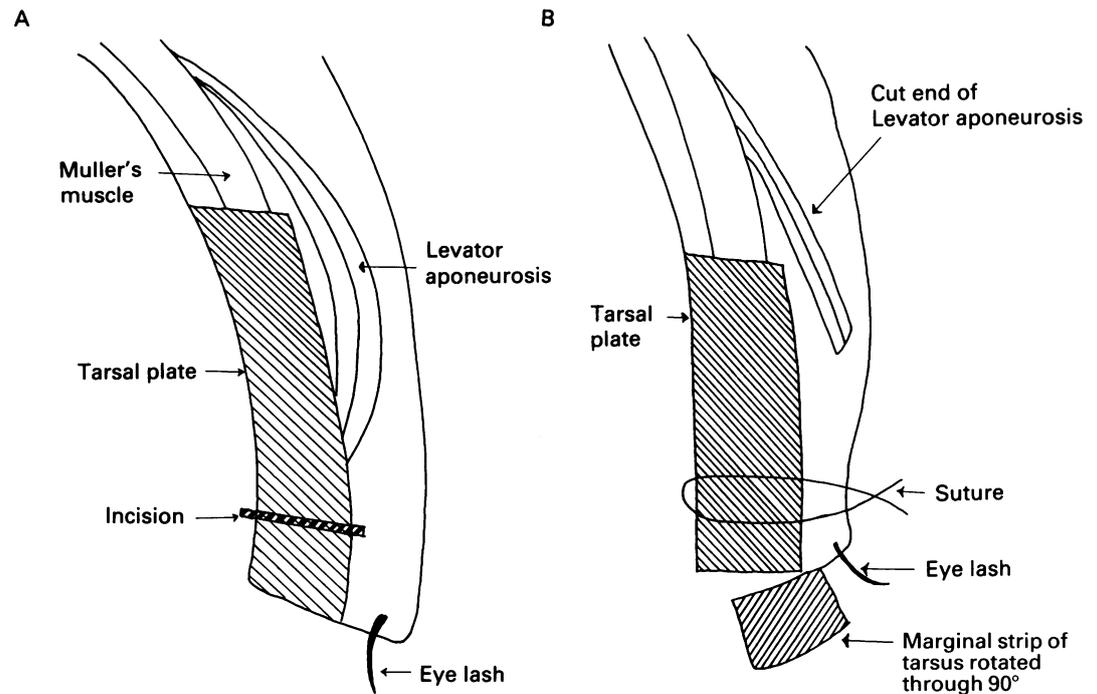
Kikuyu Hospital,  
Nairobi, Kenya  
D Yorston

Institute of  
Ophthalmology, Bath  
Street, London  
EC1V 9EL  
A Foster

Correspondence to:  
A Foster, Institute of  
Ophthalmology, University of  
London, Bath Street, London  
EC1V 9EL.

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Figure 1 Tarsal plate rotation. (A) Incision, (B) suture.



approximately yearly intervals thereafter. Patients frequently had to be followed to their homes and even fields in order to be re-examined. The operation was judged to have failed if one or more lashes touched the globe in any position. When trichiasis recurred between two follow-up visits, an assumption has been made in the calculations that the failure occurred exactly half way between the two examinations.

All data were entered on a database (Works, Microsoft) for analysis. Survival time and confidence interval analyses were calculated on a microcomputer by CIA (Confidence Interval Analysis, BMJ).

### Results

Between October 1987 and November 1989, 156 operations were performed on 94 patients. Of these, five patients (seven eyes) died before they could be followed up, two patients (three eyes) left the area, and one patient (two eyes) refused to attend for follow-up examination. Altogether, 144 eyes (92%) of 86 patients (91%) were available and the patients agreed to follow-up examinations.

Of the 86 patients 72 (84%) were female. Accurate ages were not obtainable but patients were assessed at the time of operation as probably under 50 years old or over 50 years old; 69% were judged to be over 50 years of age and 58 patients (67%) had bilateral entropion (Table 1).

No significant intraoperative complications

Table 1 Age and sex of 86 patients undergoing trichiasis surgery

	Age (years)		Bilaterality	
	<50 n (%)	>50 n (%)	Unilateral n (%)	Bilateral n (%)
Male	2 (2.3)	12 (14.0)	7 (8.1)	7 (8.1)
Female	25 (29.1)	47 (54.6)	21 (24.5)	51 (59.3)
Total	27 (31.4)	59 (68.6)	28 (32.6)	58 (67.4)

were encountered. One patient developed a wound infection 1 week postoperatively in one eye. This resolved rapidly following removal of the sutures, but the entropion recurred. The other complication encountered was central notching of the lid margin, which occurred in nine eyes (6.3%) of eight patients. This was thought to be due to ischaemic necrosis of the marginal strip of tarsus, and in no case was it severe enough to cause corneal exposure.

All patients were followed for a minimum of 9 months (range 9–36 months, mean 25.5). At the last follow up, 119 eyes (82.6%) had no lashes touching the globe, 20 eyes (13.9%) had one or two lashes, and five eyes (3.5%) had three or more lashes touching the globe.

Survival time analysis showed that the possibility of no recurrence of trichiasis at 2 years follow up was 81% (SE 3.5, 95% confidence intervals 74% to 88%), and the probability of no recurrent trichiasis at 3 years was 79% (SE 3.9, 95% confidence intervals 71% to 87%) (Fig 2).

The likelihood of recurrence was not significantly influenced by the patient's age or sex (Table 2). In order to determine if there was a learning curve for the surgeon, results for the first and second 6 months of the study were compared (Table 3). Although survival prob-

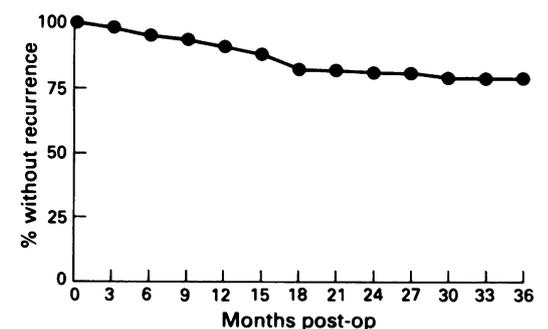


Figure 2 Survival curve for entropion surgery in the community (144 eyes).

Table 2 Success of trichiasis surgery at last follow up by age and sex in 144 eyes

	Age (years)		Sex	
	<50	>50	Male	Female
Success*	36 (80%)	83 (84%)	16 (76%)	103 (84%)
Failure	9 (20%)	16 (16%)	5 (24%)	20 (16%)
	z=0.57	p=0.57	z=0.81	p=0.42

\*No lash touches the globe in any position.

Table 3 Success of trichiasis operations performed during the first 6 months and second 6 months of study

	Number of operations performed	Percentage without recurrence at follow-up (months)			
		12	15	18	24
10/87-3/88	42	86	83	79	76
4/88-9/88	54	91	85	82	82

Differences at 24 months=5.3% (95% CI-13.5% to +22.1%)

\*No lash touches the globe in any portion.

abilities were higher for operations performed during the second 6 month period, this did not reach statistical significance (82% vs 76%,  $p=0.24$ ).

### Discussion

Recently, progress has been made in defining the major risk factors for infection with *Chlamydia trachomatis*. These include household fly densities,<sup>7</sup> poor facial cleanliness,<sup>8</sup> and the absence of household latrines.<sup>9</sup> There is evidence that health education, paying particular attention to daily face washing, can reduce the transmission of trachoma in a community. Improvements in living standards, accompanied by better environmental sanitation and personal hygiene, will hopefully reduce active trachoma infection in many regions over the next decade. However, those areas where trachoma is a particularly serious problem are usually poor, isolated, and have an inhospitable environment. Improvements in living standards, water supply, and hygiene in these communities takes place slowly and therefore control of trachoma infection is still a distant goal.

Trichiasis and entropion is the end result of years of active infection. It occurs more commonly in women, and usually after the age of 30 years.<sup>10</sup> Trichiasis is an important blinding, but treatable condition.<sup>2-4</sup>

Unfortunately there are two major obstacles to providing trichiasis surgery. The first is the shortage of ophthalmologists in areas where trachoma is a major blinding disease, and the second is the isolation and poverty of patients with trichiasis which dictates that they are the least likely to attend a hospital for treatment. Lid surgery must therefore be made available close to the patient's own community if it is to reach those in greatest need, and it must be provided by non-ophthalmologists (nurses and ophthalmic assistants) trained in the surgical procedure.<sup>3</sup>

This programme of community-based lid surgery was initiated after realising that few patients in the villages were willing to attend hospital for lid surgery. This is partly due to the

difficulty and cost involved in travelling to hospital, and partly due to the acceptance that trichiasis is 'normal' in elderly women. We have no doubt that many more people received surgery in their villages than would have been operated on had we relied on them to attend hospital.

We were unable to identify any factor leading to an increased likelihood of recurrence. It is possible that patients under 50 years old are more likely to develop recurrent trichiasis. However, as the few young patients with trichiasis (less than 30 years old) were all taken to hospital for mucous membrane grafting, any relationship between probability of recurrence and patient's age is likely to be obscured in this study.

Other studies have compared different operations for upper lid entropion, or have advocated a system of different operations for different degrees of entropion. In this study the lid surgery was performed by the ophthalmic nurse, trained in one particular procedure. For this reason it was decided to use the same operation in all patients, so that the surgeon would be familiar and develop greater expertise with the procedure.<sup>3</sup>

A trial performed in Oman by Reacher,<sup>6</sup> found that bilamellar lid rotation was more effective than other forms of surgery for upper lid trichiasis due to trachoma. Direct comparison of the study in Oman with this study is not possible as the two studies were carried out on different populations, in different settings and by different surgeons. However, the results of tarsal rotation in both studies would suggest that this is a satisfactory procedure.

We conclude that trichiasis surgery, performed in the patient's own community, by a trained ophthalmic nurse is a safe and effective means of correcting entropion and trichiasis due to trachoma. It is recommended that in areas of the world with blinding trachoma due to trichiasis where ophthalmologists are in short supply, ophthalmic nurses or assistants should be trained to provide trichiasis surgery close to where the patients live.

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- 1 Dawson CR. Pathogenesis and control of blinding trachoma. In: Tasman W, ed. *Duane's clinical ophthalmology*. Philadelphia: Lippincott, 1989.
- 2 *Guidelines for Programmes for the Prevention of Blindness*. Geneva: World Health Organisation, 1979.
- 3 Dawson CR, Jones BR, Tarizzo ML. Guide to trachoma control. Geneva: World Health Organisation, 1981.
- 4 *Strategies for the Prevention of Blindness in National Programmes*. World Health Organisation, Geneva, 1984.
- 5 Kemp EG, Collin JRO. Surgical management of upper lid entropion. *Br J Ophthalmol* 1986; 70: 575-9.
- 6 Reacher MH, Huber MJE, Canagaratnam R, Alghassany A. A trial of surgery for trichiasis of the upper lid from trachoma. *Br J Ophthalmol* 1990; 74: 109-13.
- 7 Taylor HR, West SK, Mmbaga BB, Katala SJ, Turner V, Lynch M, et al. Hygiene factors and increased risk of trachoma in central Tanzania. *Arch Ophthalmol* 1989; 107: 1821-5.
- 8 West SK, Congdon M, Katala S, Mele L. Facial cleanliness and risk of trachoma in families. *Arch Ophthalmol* 1991; 109: 855-7.
- 9 Courtright P, Sheppard J, Lane S, Sadek A, Schachter J, Dawson CR. Latrine ownership as a protective factor in inflammatory trachoma in Egypt. *Br J Ophthalmol* 1991; 75: 322-5.
- 10 Faal H, Minassian D, Sowa S, Foster A. National surgery of blindness and low vision in the Gambia: results. *Br J Ophthalmol* 1989; 73: 82-7.