COMPLICATIONS FROM INFECTIVE CORNEAL CONDITIONS TREATED BY TARSORRHAPHY

M ADU-DARKO *FRCS (Edin) FRCOphth, FWACS,*
Department of Eye, Ear, Nose and Throat, School of Medical Sciences. Knust, Kumasi, Ghana

SUMMARY
Background
Complications from infective corneal conditions are an important cause of blindness in adults and children. The eyelids play a major role in the pathogenesis of staphyloma and the perforation of descemetoceles. Tarsorrhaphy could, therefore, be beneficial in treating serious complications from infective corneal conditions.

Method: The case records of 46 patients (47 eyes) who were treated by tarsorrhaphy were analyzed in terms of demography, bacteriological studies and pre- and post-surgical intervention visual acuity.

Result: The best pre-surgical intervention vision 'hand movement' improved to 6/60 or better while the worst result was cosmetically amenable phthisis bulbi.

Conclusion: Tarsorrhaphy restored some useful vision in otherwise hopeless cases of infective corneal conditions.

Key words: descemetocele, infective corneal perforation, staphyloma, tarsorrhaphy

INTRODUCTION

In the developing countries, complications from infective corneal conditions are placed third after cataracts and glaucoma on the list of major causes of blindness in adults and children.[1,2,3,4] The most serious complications from these infective corneal conditions are descemetocele, perforation and endophthalmitis, which lead to staphyloma and phthisis bulbi.

The protective role of the eyelids is stressed in all textbooks of ophthalmology.[5] The normal spontaneous blinking of 15 per minute may, however, be responsible for the progression of large decemetoceles to staphyloma because during blinking, the descemetocele is always caught between the upper and lower lids.

The force generated during forced blinking (and probably from excessive crying of a child with descemetoceles because of pain) has been found to be as high as 50mmHg[5] and this can perforate the descemetoceles or make them protrude beyond the palpebral fissure. Tarsorrhaphy, therefore, could protect the descemetocele, and, halt its protrusion beyond the palpebral fissure. Tarsorrhaphy also acts as soft-contact lenses to seal perforated descemetoceles thus, promoting the formation of leucoma adherents.

This paper is a review of patients with complications from infective corneal conditions that were treated using tarsorrhaphy with regard to vision and cosmetic outcome.

MATERIALS AND METHOD

The case records of 46 patients (47 eyes) who were treated by temporal central tarsorrhaphy for complications from infective corneal conditions between July1988 and June 1998 at Komfo Anokye Teaching Hospital (KATH), Kumasi were analyzed in terms of age, sex, bacteriological studies and pre- and post-surgical intervention visual acuity. In some cases photographs of the cornea were taken.

The author performed all the tarsorrhaphies under local anaesthesia (except for 5 children who had general anaesthesia). The upper and lower eyelids were sutured together without excision of eyelid tissue by making an appropriate length of incision through the grey line of both eyelids using a no. 11 scalpel blade. The anterior lamellae of both eyelids were everted and the raw surfaces sutured together using 4/0 silk and tied over bolsters on the two lids. Post-operative treatment included appropriate antibiotic application through the medial and lateral windows. The sutures were removed after two weeks while the tarsorrhaphy was separated under local anaesthesia as soon as there was evidence of corneal healing or regression of staphyloma, around six weeks, on the average. Post-operative assessment after separation included visual acuity and photography in some cases. Eight patients underwent optical iridectomy to improve vision. Patients were followed up for at least four months after separation of the tarsorrhaphy. Three cases, which had fungal keratitis, were excluded from the study because of the unavailability of antifungal preparation in Ghana at that time.

RESULTS

Forty-six patients (47 eyes) were treated by tarsorrhaphy within a 10-year period with a male to female ratio of 2.6:1. The ages of the patients ranged between one

month and 70 years with a mean of 30 years. Sixty-four per cent of the patients were below 34 years.

Indications for tarsorrhaphy were as shown in table 1. Bacteriological studies showed 18(50%) cases to be due to gonococcal infection followed by *staph aureus* (table 2).

The best pre-surgical intervention vision of 'hand movement' 10(21.3%) and 'light perception' 16(34%) improved to 6/60 or better 8(19%) and 'counting fingers' at 1 metre 10 (23.8%) after surgical intervention (table 3).

Table 1. Indication for tarsorrhaphy in 46 patients and 47 eyes at Kath

Indications	No. of Eyes	Males	Females	% of Eyes
Descemetocele	18	13	5	38.3
Corneal Perforation	12	9	3	25.5
Unsightly Staphyloma	11	8	3	23.4
Endophthalmitis	6	4	2	12.8
Total	47	34	13	100

Male : Female=2.6 : 1

Table 2. Indication for tarsorrhaphy by age group expressed as percentage

	Age group as percentage					
Indications	0-10	11-20	21-30	31-40	41-50	Above 71
Descemetocele	2.1	12.8	17.0	4.3	0.0	0.0
Corneal Perforation	2.1	12.8	17.0	4.3	0.0	6.4
Unsightly Staphyloma	8.5	6.4	6.4	0.0	2.1	0.0
Endophthalmitis	0.0	0.0	0.0	0.0	0.0	4.3
Total	12.7	23.5	27.7	6.4	4.2	10.7

Table 3. Pre and post-surgical intervention visual acuity

	Pre-surgical		Post-surgical	
Visual acuity	No. of Eyes	%	No. of Eyes	%
6/60 or better	0	0	8	19
CF at 1 metre	0	0	10	23.8
H.M	10	21.3	11	26.2
L.P	16	34.0	0	0.0
N.L.P	12	25.5	13	31.0
PH. Bulbi Undeterminate	9	19.1		
Total	47	99.9	146.9	99.0

DISCUSSION

The basic principles underlying treatment of descemetocele and perforation of infective corneal conditions are:

1. To eliminate infection and halt the progressive melting of the cornea by locally produced proteolytic enzymes.
2. To protect the descemet membrane from perforation.
3. To seal the perforation in cases of perforated cornea.

Once these are achieved, natural healing takes place from surrounding healthy corneal tissues or from the limbal area in cases of large descemetoceles. It has long been stated by Cogan et al.[6] that the descemet membrane is highly resistant to perforation by infective and other causes. In the developed world, standard methods of treating these complications include conjunctival flaps, patch grafts, penetrating keratoplasty, soft contact lens placement and the use of tissue adhesives like n-butyl-2-cyanoacrylate.[7] These methods result in better vision and make staphyloma and phthisis bulbi very rare. In the developing world, we lack facilities and the only methods of treatment are conjunctival flaps and tarsorrhaphy. In a review of causes of enucleation in LUTH, Majekodunmi found that 16.8% of 101 eyes enucleated were due to chronic inflammatory diseases of the cornea which had degenerated to unsightly staphylomas.[8]

The supply and maintenance of the prostheses are poor in the developing world. Obtaining parental consent for destructive operation in children is difficult, as many parents prefer phthisical eyes to prosthesis. Any procedure, therefore, which can prevent the formation of staphylomas and improve vision, or which can improve unsightly staphylomas cosmetically is most welcome by the patient as well as the surgeon.

This review clearly shows the value of tarsorrhaphy in preventing staphyloma formation from descemetocele and restoring vision in some cases, after optical iridectomy. Although 47 patients is too small a number, the visual outcome of the cases in this series is comparable to the 104 cases of Hirst et al. in Wilmer Institute, Baltimore, who used modern methods of treatment over a 10-year period. There was an improved visual acuity of 20/200 or better in 29% of the cases.[7]

CAUSES OF INFECTIVE CORNEAL CONDITIONS

The most common cause of infective corneal conditions in the study was gonococcal infection. This was bilateral in one case but fortunately the patient regained useful vision after tarsorrhaphy and optical iridectomy. Some of the patients developed corneal complications because of inadequate self-medication and traditional eye treatment. Two patients received 'treatment' from

spiritual churches in the form of 'holy' water and 'Florida water'. Health education at the primary health care level is all that is needed to prevent these catastrophes.

Infected corneal trauma was the second common cause of infective corneal conditions in the study. Harmful traditional eye care practices and poverty were the main contributory factors. Again, health education at the primary care level is all that is required for prevention. Post-measles corneal infection was the cause of unsightly staphyloma. Only two patients benefitted from tarsorrhaphy. UNICEF's expanded programme on immunization is a real positive measure toward the eradication of measles.

CONCLUSION

From the review of cases that had complications from infective corneal conditions at KATH, tarsorrhaphy was found to be very effective in preventing constant pain in 100% of the cases. Of these cases, 30.5% had useful visual acuity with a third of them having better visual acuity than 6/60 after optical iridectomy. A small number had cosmetically amenable staphyloma and phthisis bulbi, which could be fitted with cosmetic contact lenses.

ACKNOWLEDGEMENT

I wish to thank all the nursing staff and residents of eye clinic, KATH for their assistance and encouragement.

Finally I thank Master Michael Agyekum Adu-Darko of University Junior Secondary School for his secretarial work.

REFERENCES

1. Foster A. Childhood blindness. *Eye* 1988; **2**: S27-36
2. Waddel KM. Childhood blindness and low vision in Uganda. *Eye* 1998; **12(2)**: 184-192.
3. Faal H, Minassian D, Sowa S and Foster A. National survey of blindness and low vision in Gambia. *Br J Ophthalmol* 1989; **73**: 82-7.
4. Foster A and Gilbert C. Epidemiology of childhood blindness. *Eye* 1992; **6**: 173-6.
5. Physiology of the human eye and visual system. Hargestown, Mary land: Harper and Row. 1979. 6-24.
6. Cogan DG and Kwabara T. Growth and regenerative potential of Descemet's membrane. *Trans Ophthal soc UK* 1971; **91**: 875-94.
7. Hirst LW, Smiddy WE and Stark WJ. Corneal perforations. Changing methods of treatment 1960-2980. *J Am Acad Opthamol* 1982; **89(6)**: 630-35.
8. Majekodunmi S. Causes of enucleation of the eye. *WAJM* 1982; **8(4)**: 288-90.