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# Domiciliary and Field Work

## Blink-Bell-Blindness

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The body's reaction to the leprosy bacillus may damage two nerves that are very important for a proper function of the eye and the eyelid muscles. The importance of the muscles that close the eye and the importance of sensation of the eyeball and how they relate to each other in blinking were beautifully described more than 150 years ago:

> The mechanical, and more obvious mechanism for the protection of this organ (the eye), is a ready motion of the eyelids (blink) and the shedding of tears, which coming as it were from a little fountain, play over the surface of the eye, and wash away whatever is offensive (facial nerve). But for the action of this little hydraulic and mechanical apparatus there is required an exquisite sensibility to direct it—not that kind of sensibility which enables the eye to receive the impressions of light—but a property more resembling the tenderness of the skin, yet happily adapted, by its fineness, to the condition of the organ (trigeminal nerve).
>
> This nerve extends over all the exterior surfaces of the eye, and gives to those surfaces their delicate sensibility. Now it sometimes happens that this nerve is injured and its function lost; the consequences of which are very curious—smoke and offensive particles, which are afloat in the atmosphere, rest upon the eye; flies and dust lodge under the eyelids, without producing sensation, and without exciting either the hydraulic or the mechanical apparatus to act for the purpose of expelling them. But although they do not give pain, they nevertheless stimulate the surfaces—so as to produce inflammation, and that causes opacity in the fine transparent membranes of the eye; and the organ is lost, although the proper nerve of vision (optic nerve) remains entire.
>
> I have seen many instances of the eye being thus destroyed for lack of sensibility to touch, and it has been curious to remark, on these occasions, that when the hand was waved or a feather brought near the eye, the person blinked; yet he did not shut his eye on rubbing the fingers across the eyeball. In those cases, when vision gave notice of danger to the organ, the patient blinked to avoid it, but when something touched the eye or eyelids, the sense of touch gave no alarm, and was followed by no action for the protection of the organ.[1]

Sir Charles Bell referred here to patients who had loss of sensation only but could still close their eyes. In leprosy we very often find patients who have damage to both the trigeminal and facial nerve. If patients are not instructed on eyecare when you find insufficient blink, they may develop corneal ulcers and eventually become blind. This is a serious condition in leprosy patients who may have to rely on their vision to compensate for the loss of feeling which they very often have in hands and feet. They are then unable to inspect their hands and feet for injuries.

### *Examination and care for the paralysed and insensitive eye*

*Observe* the patient and see if he blinks. Do not stare at the patient because he may stare back at you and it is then difficult to know if he has a regular voluntary blink. As you are writing your notes or

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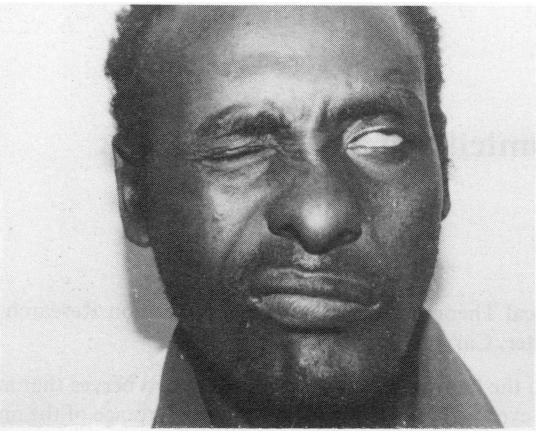

**Figure 1.** Total facial palsy left side. Notice facial asymmetry and Bell's phenomenon as patient attempts to close his eye.

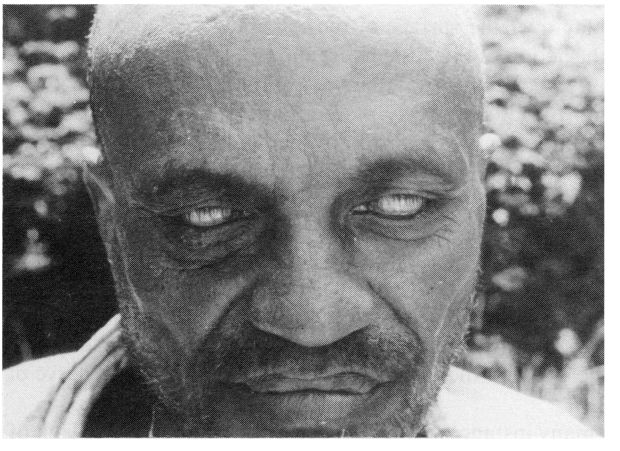

**Figure 2.** Bilateral lagophthalmos showing Bell's phenomenon.

examining other parts of the body or attending to other patients, you may look from the corner of your eye and note if the patient has a regular blink. The eyes will not be in danger if the patient has a regular blink. If you notice that the patient does not close his eyes or has incomplete eye closure then . . .

*Ask* the patient to close his eyes. You may now notice two things.

A *Patient is able to close his eyes*

Many patients are able to close their eyes when they think of it. These patients, however, have lost the sensory 'trigger' for automatic regular eye closure (blink).

These patients need to be conditioned into a 'Think-Blink' habit of eye closure in order to prevent exposure damage to the eye. Try to give practical instruction for each individual patient, e.g. 'close your eyes whenever you meet somebody, when you pass a tree, when you have ploughed one length of your field'. Try to relate the instruction to the daily activities of the patient.

**Figure 3(a)** and **(b).** Eyes open and closed in same patient. Notice sagging of lower eyelids and flies!

Instruct these patients also to close their eyes 10 times powerfully 5 times every day. This may strengthen weak eye muscles so that full eye closure might be obtained.

B *Patient is unable to close his eyes*

As the patient tries to close his eyes you will notice that the eyeball 'rolls up' under the upper eyelid (this is known as Bell's phenomenon (reflex), after the very same Bell who has been quoted earlier.)

In patients with lagophthalmos (inability to close the eye) or severe weakness and an *insensitive* cornea this will usually only happen when the patient tries to close his eyes. It therefore needs to be explained to these patients that as they try to close their eyes the eyeball rolls up and that is the way the cornea is moistened and foreign bodies are washed from the cornea.

Instruct these patients to try to close their eyes as often as they can, but at least a few times every hour (see also 'A'). This reflex will usually happen 'spontaneously' in patients with eyelid weakness or lagophthalmos and a *sensitive* cornea. The eye is then not in so much danger.

It is important that the patients who do not have a regular blink are instructed to wear (sun) glasses and a hat with a large brim that will prevent the wind from blowing into their eyes and the sun from shining directly into their eyes.

The patient should also be taught to inspect his eyes daily for redness and foreign bodies. A spouse or relative should be instructed to inspect the eyes if the patient does not have a mirror. Surgery for the paralysed eyelid muscles will only partially help in the prevention of exposure damage to the eye. Regular eye inspection and exercises will have to be continued after surgery also.

*Remember* if you do not see a *blink*, it should ring a *bell* for you to take action in order to prevent *blindness.*

*Reference*

[1] Bell, Charles KGH. *The Hand.* First printed in London by William Pickering, 1833. Reprinted 1979, The Pilgrims Press, Brentwood, Essex, England.

**Management of ulceration in anaesthetic extremities**

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*Introduction*

Whenever an extremity is insensitive to pain it will unwittingly be traumatized to the extent that tissue damage readily progresses to actual ulceration.

Leprosy is the most common cause for insensitivity leading to such damage, but other causes of neuropathy can have the same end result. The patient attributes the injury to the underlying disease rather than simply to the insensitivity.

The fact that there are many treatments and procedures proposed for management of neuropathic ulceration indicates that as yet we do not have a really good solution to the problem.

The subject is briefly reviewed in *Leprosy* by Bryceson & Pfaltzgraff.[1] The matter is fully dealt with by Brand in *Insensitive feet*.[2] I suggest that leprosy workers should re-read *Insensitive feet* annually. It contains a great deal of information that we tend to forget.

The following suggestions offer some alternative ways of tackling the problem. They have been found to work in one situation—at Garkida in Gongola State, Nigeria. They may contain some suggestions to help solve this very difficult aspect of leprosy management.

**1** Immobilization is vital. Use a splint for the hand or arm. Splint or use crutches for a foot. If there is bilateral foot involvement use a wheelchair or have the patient scoot on the floor using 'hand-sandals' made like small slippers but with a single strap.

**2** The total contact walking cast, as described by Brand, works in some situations and is excellent, but was seldom satisfactory in our unit.

**3** If possible make shoes at an early stage so they are available when the patient is ready for them. This cannot be done if there is too much oedema initially, or if the foot will be altered by surgery.

**4** Control infection. Elevate infected limbs. Use appropriate antibiotics. The most practical seems to be penicillin and, if infection is especially severe, add streptomycin, or add later if infection is not rapidly controlled by penicillin.

**5** Dressing. The most satisfactory all round dressing is done with silver nitrate 0·5% wet dressings. No bacteria can develop tolerance to silver nitrate ($AgNO_3$). The crystals of $AgNO_3$ are placed in a brown-coloured bottle and the requisite amount of water added. Water can usually be used directly from the tap. If there is a precipitate when water is added to the silver crystals then it may be necessary to use rain water or distilled $H_2O$ instead.

The $AgNO_3$ solution is self-sterilizing, but should always be kept in a dark bottle and should not be stored so long that a precipitate develops. If there is a significant precipitate, it should be discarded. The dressing material can be gauze, or cotton (or even raw, unprocessed cotton) that

does not require sterilization as it is rendered sterile by the silver. No bacilli can grow in a solution of silver nitrate that has not reacted with tissue proteins, yet it does not damage living tissues.

$AgNO_3$ dressings should be occluded with a sheet of polyethylene plastic extending beyond the dressing, and wrapped with a bandage. Dressings *must* be changed twice daily. One-half per cent $AgNO_3$ can also be used on clean postoperative wounds where there may be potentially infected tissues or where there may be bleeding. It seems to help to stop postoperative oozing. But for this use it is not occluded with plastic and the dressing allowed to dry. Such a dry dressing can be kept in place for up to a month (possibly longer) until sutures are removed. This, for example, is a good postoperative dressing after arthrodesis of the ankle.

The only disadvantages of using $AgNO_3$ are unrelated to its value for patients. It stains the skin of both patients and staff, as well as linens, the floor and furniture, so that it looks unsightly. There is no practical way to remove the stain, but the colour, of course, is lost as the epidermis is shed. We have had one staff member who seemed to develop an intolerance to the solution, getting fissured, dry, inflamed fingers. This can be suppressed with corticosteroid ointments.

**6** Debridement—remove *only*: a, dead bone unattached to tissues, or a bone that will definitely impede plantigrade walking or foreward propulsion of the foot. *Be conservative*; b, *dead* skin; c, protuberant granulation tissue; and d, functionless tissues that cannot possibly be used for weight bearing can be amputated. Preferably, however, fillet and rotate to cover an area of ulceration or scar.

Excise areas of ulceration, or scar tissue that has ulcerated repeatedly. Good footwear allows more conservatism in surgery. So the surgery that is indicated will relate to the potential for prosthetic footwear. A good shoe programme is *vital*.

Malignant growths can be radically excised if not extending to bone. If deep and fungating, with multiple sinuses, the tumour probably involves bone and amputation is indicated. Leave the stump as long as possible, but do not leave the malleoli. Rarely do these tumours metastasize. Exposed bone, even with a rough surface, can be saved. Patience will be rewarded by a slough of the dead surface of the cortex leaving vital granulation tissue over which it is possible to apply skin grafts.

A very severe infection, especially with gangrenous tissue requires urgent debridement, possibly followed by a second debridement. Otherwise delay debridement until infection has mostly cleared.

**7** Skin grafting. Grafting skin onto defects of the hand, foot or lower limb are rewarding. Split thickness or pinch grafts can be used. Graft only when there is healthy, dry, dark red granulation after dressing with $AgNO_3$. Exuberant granulations occasionally need to be touched with a $AgNO_3$ stick, or alternatively a period of dressing with Iodoform powder. For scars that repeatedly break down, it is preferable to excise completely to normal tissues under tourniquet-controlled haemostasis. Seldom is there excessive bleeding and sometimes a split graft can be applied primarily. More frequently grafting needs to be done later. Perforate split grafts with the tip of a scalpel, making slits at about a centimetre apart, and apply the graft carefully with mosquito forceps. Usually it need not be sutured in place. If bleeding is likely, delay grafting and dress with $AgNO_3$.

All grafted patients should be given antibiotics from prior to the procedure until almost completely healed.

Closely woven cloth impregnated with Vaseline and then sterilized can be placed over the graft for the first few days to prevent the $AgNO_3$ dressing adhering to the surface.

Where there are no facilities to make split grafts; when conditions are not ideal or with a wound that is not completely clean, pinch grafts may be used successfully. Prepare the area to be grafted and the donor site and drape, using sterile technique. Procaine or other local anaesthetics can be used for the donor area, none is required in the graft site.

A small stiff needle is required to pick up the skin. A hypodermic needle will serve, but a Hagedorn needle is better. Pick up the skin on the point and cut off a circle of skin about 3 mm in

diameter. Carry it to the ulcer site and with a downward pressure on the needle push the piece of skin under the surface of the granulations. The consistency and depth of the granulations determines the technique for burying the graft adequately. It takes a bit of trial and error to develop the technique. The needle is held at about 25° to the skin, then while pushing the point down into the granulations the back of the needle is elevated while the point is moved slightly forward—a combination of rotation around an axis at the middle of the needle, and forward advancement.

When the graft is buried in the granulations place the back of the scalpel blade over the shaft of the needle just at the place where it enters the granulations and pull out the needle in the line of its shaft. The scalpel will hold the graft in the granulations if they are adequate. If they are not healthy or too fibrous, the graft may pop back out. In that case it is better to continue dressings with $AgNO_3$ for a few more days.

The donor site can be dressed with $AgNO_3$ without the plastic occlusion and left to dry. At about 1 week it will have healed.

The grafted site should be dressed with $AgNO_3$ and plastic occlusion and changed twice daily, beginning 6–12 h after surgery. Penicillin is used to prevent infection, beginning prior to surgery and continuing until almost complete healing.

Grafts can be placed slightly less than 1 cm apart. If one attempts too close a placement, those previously buried will be disturbed. On about the third or fourth day the grafts will move up to the surface, flatten out, and begin to grow.

If there is any question of movement of the area grafted, or if on a weightbearing surface, a posterior plaster slab should be applied to immobilize nearby joints.

**8** 'Small cast'. A small ulcer that is not infected, yet does not heal can sometimes be cured by use of a 'small cast'. This is made by applying one roll of 6-inch plaster, with a single small dressing with a bit of antibiotic applied right over the ucler. This thin cast immobilizes, keeps clean and prevents walking. If the patient walks it becomes dirty or breaks! The cast usually is removed after 2 weeks, and if the ulcer is not fully healed can be replaced for a further 2 weeks.

**9** Graded walking. Gradually increasing walking *under supervision* is important. The first day 5 min of walking is enough, the second day two 5-min periods gradually increasing until the patient is ready for discharge. This cannot be timed, but varies depending upon the severity of the ulcer, the deformity, the amount of scar, etc.

Warning. No bandage should ever be placed on a foot and then the foot forced into a properly fitted shoe!

*Conclusion*

If patients are cooperative, with this programme any ulcer that has not undergone malignant degeneration will heal. If it does not heal either there is malignancy, which will express itself as a fungating growth, or more patience is required.

*References*

[1] Bryceson A & Pfaltzgraff RE. *Leprosy*. Edinburgh: Churchill-Livingstone, 1979.
[2] Brand P. *Insensitive Feet*. The Leprosy Mission, 1981.

**WHO: Blindness prevention; training auxiliary personnel in eye care**

The *WHO Chronicle*, **34:** 332–5 of 1980 carries an article on the above subject with the following summary:

> Unless active measures are taken to combat blindness, much of which is preventable or curable, it is expected that by the year 2000 the number of blind in the world (at present 30–40 million)

will increase considerably. Auxiliary health personnel have an indispensable role to play in the delivery of eye care and in preventing blindness. Last year a WHO task force met in Bethesda, Maryland, and discussed the training of such auxiliaries for blindness prevention and for providing eye care to all populations through the primary health care services. This article is based on the report of that meeting.

Emphasis is given to the idea that much blindness is avoidable. The main headings are: peripheral level; the primary health workers' tasks; intermediate level; duties of health personnel; training auxiliaries; examples from three countries (Guatemala, India and Kenya).

***Primary eye care manual for health workers*; Kenya**

Through correspondence with Mr John Macharia Waruhiu, Field Training Officer, Kenya Rural Blindness Prevention Project, Kenya Society for the Blind, Barclay House, Langata Road, PO Box 46656, Nairobi, Kenya, we have received a copy of this manual—one of a range of materials produced by the International Eye Foundation in the USA. The manual is on A4-sized paper, 7 pages only, extremely clearly printed and illustrated with black and white diagrams. It is designed for primary eye care within the context of primary health care, and is based on the belief that over 75% of all blindness in Kenya is preventable or treatable. Dr Randolph Whitfield Jr, Ophthalmic Consultant, Central Province, Kenya has written to explain that the International Eye Federation (PO Box 1323, Nyeri, Kenya; 7801 Norfolk Avenue, Bethesda, Maryland 20804, USA) has also produced teaching manuals on other aspects of ophthalmology which have been field tested and printed for nurses, clinical officers, teachers and students in rural health training centres.

**International Agency for the Prevention of Blindness; IAPB**

Dr Carl Kupfer, President of the IAPB (National Eye Institute, Building 31, Room 6A03, Bethesda, Maryland, USA) has kindly written to us with a copy of the latest IAPB News (No. 4, Spring 1984). This excellent newssheet has information on eye disease and blindness prevention from over 30 different countries, including articles, notices, announcements of meetings, research and primary eye care. The current issue has items on: successor to Sir John Wilson in the Royal Commonwealth Society for the Blind; prevention of blindness in Tanzania; Christoffel-Blindenmission in Tanzania; Helen Keller International; 'tips on eye care' from Bwino, the quarterly health magazine in Zambia; International Eye Foundation projects in Kenya and Malawi; a list of recent WHO meetings.

**'Eye Camps' in South India; Kasturba Kusuta; Nivaran Nilayam**

We are most grateful to Professor Jagadisan ('Sankaran', No. 38, First Main Road, CIT Colony, Mylapore, Madras, 600 004, India) for the following information about eye camps held in South India:

> We conducted two eye camps, one in April 1982 and another in February 1983. My good friend Dr Raja Savarirayan of the Christukula Ashram, Tirupattur, North Arcot, who has been engaged in ophthalmic work for half-a-century, was good enough to conduct the camps with grants from Christoffel-Blindenmission, West Germany. The cataract operations were done by an expert ophthalmic surgeon of Salem Dr K G Gurubatham and Dr Raja Savarirayan. A number of trained and experienced ophthalmic assistants came with the surgeons. Our own staff, doctor, nurse and others, gave their help. These eye camps benefited our leprosy patients for whom poor vision is a 'double' blindness because of their insensitive fingers. But these camps also benefited a considerable number of non-leprosy cataract patients. The first camp, from 23

to 30 April 1982, benefited 56 patients, of whom 11 were leprosy patients, the rest being general cases. The second camp was held from 16 to 25 February 1983. This camp benefited 49 general cataract patients and 10 leprosy patients. Thus, 21 leprosy patients and 94 patients from the general population (non-leprosy) were benefited by these camps. The results have been very good because of the intensive care before and after operations that Dr Raja Savarirayan and his colleagues bestowed upon the patients. Moreover, since the patients came from neighbouring villages, they could come to our hospital for treatment of any complications and for long-term follow-ups. The holding of these camps here has increased the awareness of the medical, nursing and para-medical staff to the eye problems of leprosy patients, and much care is taken to relieve eye complications and to prevent poor vision. The holding of these camps at which leprosy patients (a minority) are operated on the same table and treated in the same wards as the non-leprosy cataract patients of the general population (the majority) has been a striking step towards integration, both medical and social, of the leprosy patients with society. It is also one plank among many in our new scheme through leprosy work to better living and better health care.

**'Slide-text' Colour Transparency Teaching Sets on Leprosy**

We have recently reviewed those which are known to this office and take this opportunity of recording the following information:

**1** *India. Leprosy I and Leprosy II.* Authors Parekh, Ganapati and Chetan Oberai. Produced by Medical Education Department, Glaxo Laboratories (India) Ltd, Worli, Bombay 400 025, India. Each set has 24 colour slides, with text, covering virtually the whole subject of leprosy. Apply to Dr Phatnani at the above address.

**2** *India. Reconstructive Surgery in Leprosy*, prepared by N H Antia and S G Kamat. 1, Opponens plasty. 2, Correction of clawed fingers. These excellent slide sets describe two of the most important operations for deformities of the hand in leprosy. The first has 24, and the second 48 colour slides of high quality, which are designed '. . . to provide an easy introduction to the subject and stimulate interest for further reading and for undertaking surgery.' The text is extremely clear for both operations and could be used either for self-instruction or teaching others. The cost of (1) is Rs 250 and of (2) Rs 500. Enquiries to Dr N H Antia, Ben Nevis, Bhalabhai Desai Road, Bombay-400 036, India.

**3** *USA.* National Hansen's Disease Center, Carville, Louisiana 70721, USA. Dr R O'Connor, Chief of the Training Branch can supply information and documents on a wide range of teaching material available from this centre, and this includes a comprehensive slide-text set on *Clinical Aspects of Leprosy* with 60 slides.

**4** *Europe.* The WHO Regional Office for Europe have produced a set of *Leprosy in the Light-Skinned*, prepared by Dr D L Leiker (Amsterdam). This includes a 21-pp booklet as the descriptive text and there are 50 slides. Enquiries to Dr B Velimirovic, Regional Officer for Communicable Diseases, at the WHO Regional Office for Europe, 8 Scherfigsvej, DK-2100, Copenhagen, Denmark.

**5** *The Netherlands.* In the 'MEDDIA' series, a very comprehensive set of colour slides is available, either as conventional 35 mm transparencies, or on microfiche (with viewer); and there is a full text to accompany the set. Royal Tropical Institute, 1092 AD, Amsterdam, The Netherlands.

**6** *United Kingdom.* As 'an activity of the Tropical Child Health Unit', Institute of Health, 30 Guildford Street, London WC1N 1EH, TALC (Teaching Aids at Low Cost) produce a wide range of teaching–learning materials, including a comprehensive series of slide-text sets, at remarkably low cost. There are two on leprosy: Lp, *Leprosy In Childhood*; LpCn, *The Classification of Leprosy* has 24 slides, with full text.