# PLASTIC SURGERY FOR FACIAL NERVE PALSY WITH LAGOPHTHALMOS

By George S. C. Wong, B.Sc. (Med.), F.R.A.C.S.

Patients with facial nerve palsy have the characteristic assymmetry of the face and drooping of the lip which is well known. Those with involvement of the upper branches of the facial nerve, which supplies the eyelids, will have ectropion and lagophthalmos as well. (Figs. 3 & 4).

In this discussion, emphasis is given to the treatment of lagophthalmos alone. This is a preliminary report of a series of cases of plastic surgery carried out for lagophthalmos, in Singapore, during 1965-1966.

## ANATOMY AND PATHOLOGY

The facial nerve supplies the muscles of facial expression. The temporal and zygomatic branches supply the forehead and eyelid muscles. When these are involved by disease, the orbicularis oculi muscles become paralysed.

For practical considerations, the eyelids are activated by 2 groups of muscles, each innervated by a different cranial nerve:—

1. the eyelid "closers"—the orbicularis oculi muscle innervated by the facial nerve,
2. the eyelid "Openers"—the levator palpebrae superiores muscle, supplied by the oculo motor nerve.

Paralysis of the eyelid "closers" therefore results in ectropion and lagophthalmos.

## CLINICAL FEATURES

Clinically, the following features are seen in lagophthalmos:—

1. Ectropion of the eyelids—(Figs. 1 & 2),
2. Widened palpebral fissure—even at rest (Fig. 1),
3. Inability to close the eyelids actively, (Fig. 2).

Several secondary defects follow these deformities:

a) Epiphora—the ectropion of the lower lid, causes the punctum to fall away from the globe of the eye. This results in an inability of the tears to be conducted away effectively, into the lachrymal duct. Tears will accumulate and overflow, hence the patients complain of "watery eyes", especially when exposed to irritations, such as wind and foreign bodies.

b) Conjunctivitis—this is due to the loss of protective function of the eyelids (Figs. 1 & 2)

c) Keratitis and iritis

d) Corneal ulceration—may be the final outcome, and ultimately irreversible damage to the eye.

## AETIOLOGY OF FACIAL NERVE PALSY

The facial nerve is susceptible to a variety of causes of injury and disease. Very often this leads to irreversible damage to the nerve, and complete paralysis to the facial muscles.

It is not necessary to list the causes here, except to indicate that in Singapore, leprosy is a major cause of facial palsy. Many of these patients have been cured of leprosy and are no longer infective, but they carry with them the stigma of this socially unacceptable disease. These patients are willing to undergo any treatment to have this stigma removed.

## REASONS FOR OPERATION

a) Stigma of leprosy—as discussed above.

b) Exposure conjunctivitis—It is imperative that patients with lagophthalmos, should have surgical correction, as soon as possible, to restore the protective mechanism of the eyelids as nature had intended. Otherwise the eye may suffer irreversible damage.

c. Cosmetic reasons.

## METHODS OF CORRECTION

These may be classified as static or dynamic methods.

a) *Static:* The principle with this type of correction is to narrow the palpebral fissure. There are no active movements at all.

i) Tarsorraphy:
This is a relatively simple method. It suffers from the disadvantage that the

Fig. 1. (Patient A)—Right lagophthalmos with classical effects of epiphora, congested eye and ectropion.

Fig. 2. (Patient A)—Note the inability to shut the eyelids actively, and loss of its protective function.

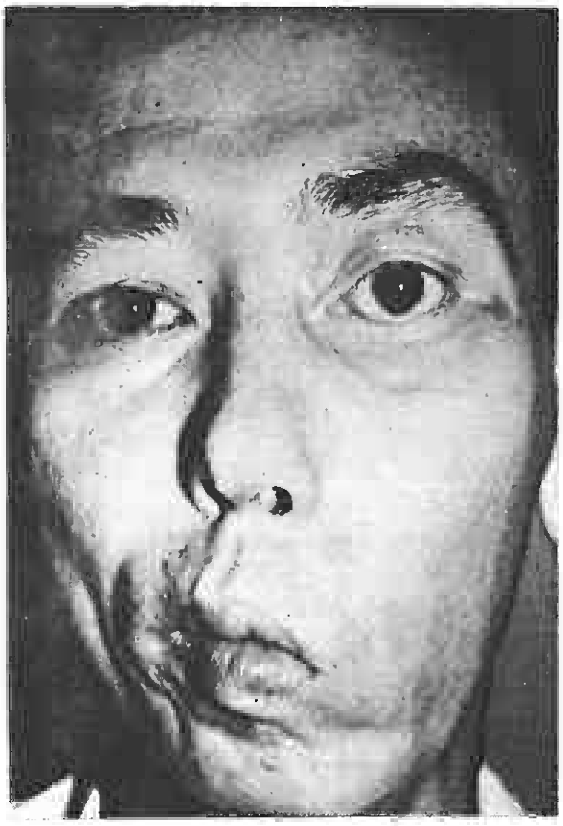

Fig. 3. (Patient B)—Typical facial droop and lagophthalmos, due to complete facial nerve palsy, on the left side.

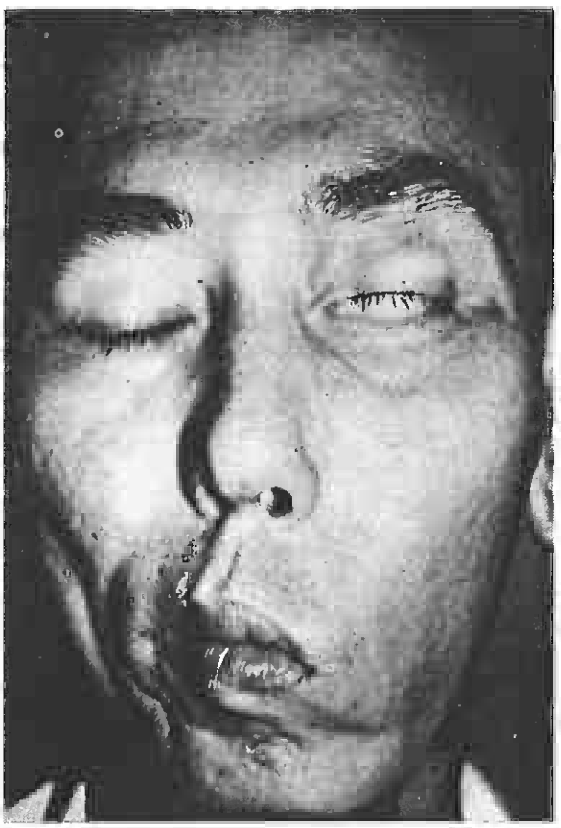

Fig. 4 (Patient B)—No movements in the facial muscles and inability to close the left eyelids, leaving a wide gap.

Fig. 5. (Patient C)—Preoperative appearance showing marked lagophthalmos of right side.

Fig. 6. (Patient C)—Post operative appearance showing active closure of the eyelids, after the temporalis muscle transfer operation.

palpebral fissure is narrowed, causing asymmetry, and is cosmetically unacceptable. It also has the disadvantage that it does not restore active movements to the eyelids.

ii) Static fascia lata slings:
This method aims at correcting the ectropion by slinging the lower eyelid with fascia lata. It is better than tarsorraphy from the Cosmetic standpoint, but it still does not restore movements to the eyelids.

b) *Dynamic methods:* The principles underlying these methods is to restore movement back to the paralysed eyelids.

i) Temporalis muscle transfer:
The movements in the eyelids are restored by transplanting a different motor unit. Part of the temporalis muscle with its fascia is transferred to the eyelids to correct the defect. It gives a normal-looking and symmetrical palpebral fissure at rest, and active movements are restored. The author believes that this is the best method for correcting lagophthalmos.

ii) Nerve graft:
In recent cases of facial nerve injury-nerve grafts may restore active function. But this has many disadvantages. The results are uncertain, and it requires the sacrifice of another cranial nerve.

## TECHNIQUE OF TEMPORALIS MUSCLE TRANSFER

The object is to transfer a functioning motor unit to move the paralysed eyelids. The temporalis muscle is always normal in cases of facial palsy. It has a different nerve supply, being from the deep temporal branches of the mandibular division of the trigeminal nerve.

Incision: A vertical incision is made within the hair bearing area so that the scar will not be visible. This incision is made just above and anterior to the ear.

The temporalis fascia, which is identified by its shiny surface, is now incised vertically, and two strips of it, dissected off. At the temporal line, where this fascia is attached to the bone, the periosteum is raised with it. The fascia is then turned over upon itself 180 degrees. Then a small strip of temporalis muscle is dissected off sufficient to allow this muscle-fascial strip to reach the medial canthus of the eye.

Each strip of fascia is then tunnelled through the eyelids—one for the upper lid, and one for the lower lid. The ends are then brought round the medial canthal ligament of the eye and sutured firmly into place, under some tension. By this stage, the eyelids should be completely closed by the tension on the fascial strips. The wounds are closed in layers, and the patients are advised against chewing for about 10 days.

## RESULTS

This method was described by Gillies (1), and had been in use in India extensively for lagophthalmos (2). The results had been very good. The author had carried out this operation for 15 cases of lagophthalmos, in the period 1965-1966, and had confirmed the effectiveness, and advantages of this method over the others. There is no doubt of its superiority over the static methods. By the end of 3 weeks, all the patients were able to shut their eyes actively by learning to use the temporalis muscle.

There was 1 case of failure in this series, due to the fascial strip rupturing near the medial canthal ligament.

In some of these patients, a fascia lata sling was also performed for the drooping face and lip, through the same incision.

## ADVANTAGES OF THE TEMPORALIS TRANSFER OPERATION

1. It restores active movements to the paralysed eyelids, which the static methods cannot achieve. (Figs. 4 & 5)
2. The palpebral fissure is not narrowed. There is no asymmetry, and the cosmetic result is excellent.
3. It has a high rate of success, which is not the case with nerve grafts.
4. No nerve or muscle is sacrificed.
5. Fascia lata sling operation to the face can be carried out simultaneously through the same incision.
6. The scar is hidden within the hair bearing area.

## DISCUSSION

Facial nerve palsy with lagophthalmos is relatively common in Singapore. In addition to the usual causes, leprosy account for a very large number. These patients already cured of their

disease, are still left with an unacceptable stigma of facial palsy.

Plastic surgery in these cases is well worth while. Operative correction should be carried out for lagophthalmos as soon as possible. The best method is the temporalis transfer operation, as it achieves the best results in terms of form and function. The only contraindication to this operation, is in the very old and infirmed patient who will not take an operation.

## SUMMARY

1. The clinical picture of facial palsy with lagophthalmos is described.
2. Temporalis muscle transfer is recommended as the operation of choice.
3. The good results, and its superiority over the other methods, are confirmed by the author on a preliminary series of 15 cases carried out in Singapore.

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