

RESULTS OF SURGICAL CORRECTION OF LAGOPHTHALMOS (Gillies Technique) IN LEPROSY PATIENTS¹

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ABSTRACT - *The results of the temporal muscle transfer (Miles technique) in 51 eyes (34 patients) have been analysed. The main objective was to evaluate the degree and time needed to recover voluntary occlusion and the static effect of the transfer on the lower eyelid in cases of partial ectropium and epiphora.*

In 34 (66,67%) eyes there was complete and lasting voluntary eyelid occlusion. The medians of time to obtain complete eyelid closure while biting were 8 days (1-120) in the excellent group and 14 days (1-120) in the good group. The correction of ectropium and epiphora was seen in 15 (83,33%) eyes.

The recovery of voluntary eyelid closure and repositioning of lower eyelid observed in the majority of our cases confirm the effectiveness of the Gillies technique for correction of lagophthalmos.

Key words: *lagophthalmos, Gillies technique, temporal muscle, facial paralysis, rehabilitation, leprosy.*

1. INTRODUCTION

The paralysis of the *orbicularis oculi* muscle leading to lagophthalmos is a known complication in leprosy, caused by lesion to the zygomatic branches of the facial nerve or, less frequently, to its trunk^{2,3}. It occurs in 3.1% to 20.2% of the patients⁴ and is commonly associated to different levels of cornea hypoesthesia, due to involvement of the ciliary branches of the trigeminal nerve⁴.

The consequences of the changes in eyelid physiology and loss of protection reflex are dryness of the cornea, queratites, ulcers, secondary infections, that can lead to vision loss^{4,11,12}.

There are many surgical procedures to avoid or minimize the complications caused by paralysis of the *orbicularis oculi* muscle. Gillies (1934, 1957)^{7,8} technique of transferring the temporalis muscle, described in detail by Andersen (1961)¹ and Antia (1966)² won notariety because of its dynamic nature in rehabilitating the paralysed eyelid movement.

The criteria for evaluation and results of this technique in the treatment of lagophthalmos in leprosy vary among authors. Some of them utilize functional criterion based only on the degree of eyelid lag, while eye is being closed^{1,2,9,13, 14}. Others classify the results according to functional and aesthetic criteria^{10, 16, 19}. There are also references to the evaluation of results described

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by subjective statements as "better than before and cosmetic" ²⁰, "satisfactory" ¹⁸ and "the temporalis transfer were successful in helping patients to close the eyes"¹⁵.

Gillies technique has been utilized at the Instituto "Lauro de Souza Lima" since 1978. Up to the end of 1989, the surgery was performed in 34 patients. Follow-up of these cases allowed the evaluation of static and dynamic effects of temporal muscle transfer on the paralysed eyelids.

2. MATERIAL AND METHOD

Pre and post-operative of 51 surgeries of temporal muscle transfer using the Gillies technique performed in 34 leprosy patients for treatment of lagophthalmos were followed.

In this technique the middle third of temporal muscle and its fascia are tunneled subcutaneously toward the lateral angle of the eye. The fascia is splitted into two strips that are tunneled close to the eyelid margins to encircle the eyelids, and the strips are then anchored to the medial palpebral ligament (Figs. 1, 2).

All the patients were submitted to medical and physical therapy pre and post-operative evaluations.

In the pre-operative the following data were recorded: a) sex, color, age, classification of the disease; b) previous eyelid surgeries; c) position of the lower eyelid and functional condition of the tear drainage system; d) power of orbicularis oculi and temporal muscles; e) measurement of the eyelid lag during eye closure; f) presence of involuntary intermittent and reflex blinking.

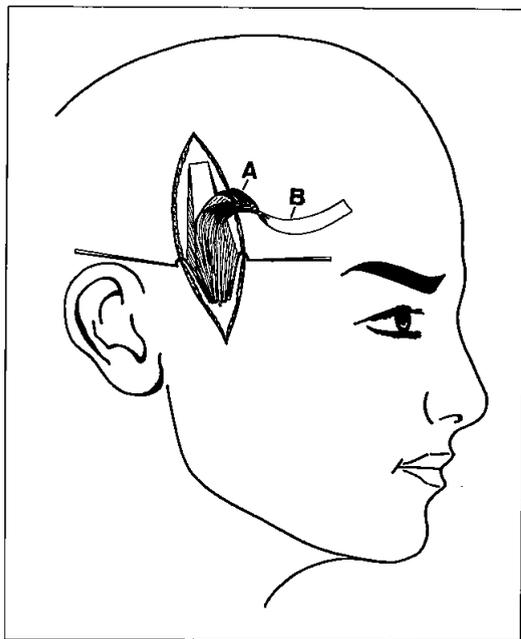


Fig. 1 - Temporal muscle (A), Temporal fascia (B).
Músculo temporal (A), Fáschia temporal (B).

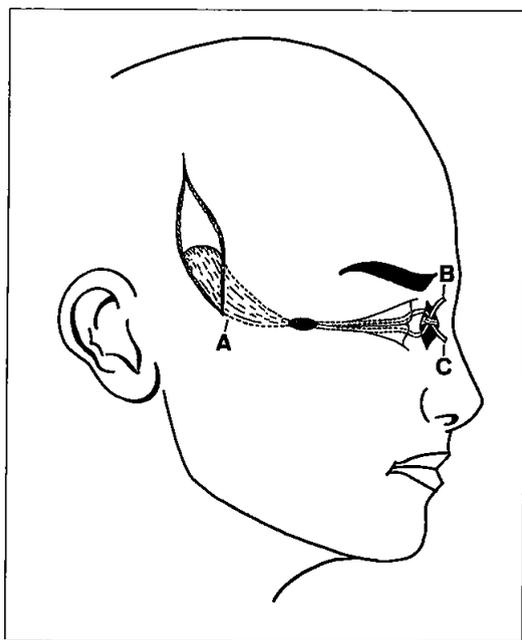


Fig. 2 - Fascial muscle pedicle tunneled through lower (A-B) and upper (A-C) eyelids and sutured to the medial palpebral ligament.

Pedículo músculofascial tunelizado através da pálpebras inferior (A- B) e superior (A- C) e suturados no ligamento palpebral medial.

Fifteen days preceding the surgery all patients were submitted to masticatory exercise program to strengthen temporal muscle, totalling 300 exercises divided into 3 daily sessions.

In the post-operative period the following aspects were evaluated: a) position of the lower eyelid and functional condition of the tear drainage system; b) measurement of the eyelid lag during eye closure while biting, without biting and during the opening of the mouth; c) presence of involuntary intermittent and reflex blinking six months after surgery.

Twenty days after the surgery all the patients were submitted to afunctional reeducation program in 3 to 4 daily sessions, progressively increasing the number of exercises up to 50 per session.

In the sitting position, looking toward the knees the patients were asked to bite and close the eyes simultaneously. The patients who were able to close the eyes completely were instructed to keep the eyes closed and open the mouth.

Results of Gillies technique were evaluated according static and functional eyelid effects. The static result was considered satisfactory only when remission of partial ectropium (partial lowering of the inferior eyelid with respect the eyeball) and epiphora was complete.

Functional results were classified according to the degree of corneal protection during the voluntary eyelid closure and functional independence of transferred muscle, as follows:

Excellent: complete eyelid closure without biting.

Good: complete eyelid closure with moderate effort, while biting.

Table 1 - Distribution of temporal muscle transfer results, according to functional criterion.

Results	Total of eyes	%
Excellent	19	(37,26)
Good	15	(29,41)
Fair	15	(29,41)
Unsatisfactory	2	(3,92)
Total	51	(100,00)

Fair: incomplete eyelid closure (gap up to 3mm.) with moderate effort while biting, and corneal protection.

Unsatisfactory: incomplete eyelid closure (gap > 3mm.) or insufficient to protect the cornea, while biting.

The static and functional results were evaluated six months after the surgery.

3. RESULTS

Thirty men and four women with age between 24 e 72 years old (median = 46) were surgically treated by Gillies technique to correct lagophthalmos. The patients were clinically classified as 14 lepromatous, 10 tuberculoids and 10 borderlines.

Eighteen had bilateral paralysis of *orbicularis oculi* muscle and 16 had unilateral paralysis. The eyelid lag varied from 5 to 12 mm. (median = 8) while trying to close the eye.

The pre-operative functional condition of temporal muscle in all patients was normal when the muscle was palpated.

In 11 eyes with lagophthalmos associated to complete ectropium, the deformity was surgically treated before temporal muscle transfer. In 18 eyes partial ectropium was associated with epiphora. Two of these 18 had irreversible lesion of lacrimal drainage system.

From the 51 surgically treated eyes the functional result was excellent in 19 (37,26%) eyes (fig.3 e 4), good in 15 (29,41%) eyes (fig.5 e 6), fair in 15 (29,41%) eyes and unsatisfactory in 2 (3,92 %) eyes (Table 1).

In the cases with excellent result the median of time to get complete eyelid closure while biting was 8 days (1-120) and without biting 21 dias (4-120). In cases with good result the median of time to get complete eyelid closure while biting was 14 days (1-120).

Involuntary reflex and intermittent blinking was not observed in any of the 51 operated eyes.

In 8 eyes the lack of success regards incomplete eyelid closure was attributed to



Fig. 3 - Pre-operative: lagophthalmos.
Pré-operatório: lagoftalmo.

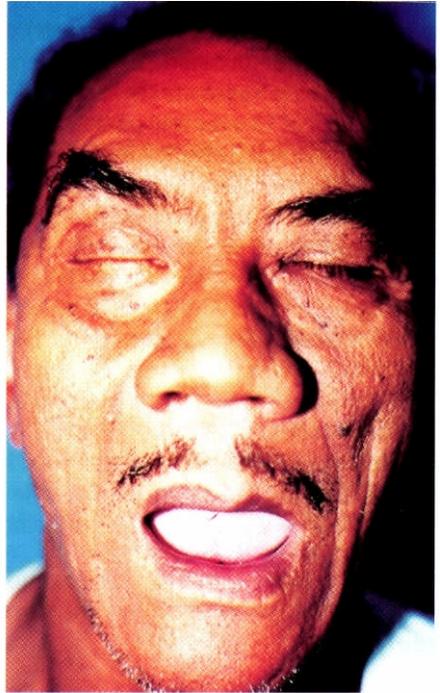


Fig. 4 - Post-operative: excellent result.
Pós-operatório: resultado excelente.



Fig. 5 - Pre-operative: lagophthalmos.
Pré-operatório: lagoftalmo.



Fig. 6 - Post-operative: good result.
Pós-operatório: resultado bom.

anatomic causes (dislocation of the inferior strip, loss of tension of the strips, detachment of the strips from the medial palpebral ligament), in 4 eyes, to insufficient duration of post-operative physiotherapy and in 5 eyes the cause is unknown. In 15 (83.33) out of 18 eyes with partial ectropium and epiphora, the static effect of the surgery was confirmed by the correction of these pathologies.

From the 3 cases were partial ectropium and epiphora was not corrected, one had irreversible lesion of lacrimal drainage system before surgery, in another there was dislocation of the inferior strip of temporal fascia and in the last one the two causes were present.

Forty-five eyes were functionally re-evaluated periodically after the surgery. There was worsening in 6 eyes, from which 4 went from fair to unsatisfactory and 2 went from good to fair. The median follow-up duration was 40 months (7-153).

4. DISCUSSION

The temporal muscle transfer has been indicated as the best choice in the treatment of lagophthalmos, promoting the recuperation of voluntary eyelid occlusion and repositioning of the lacrimal punctum^{1,6,13}.

The static effect of the transfer was confirmed among our cases. In the majority of them (83,33%) the surgery completely recuperated the apposition of the lower eyelid in regard to the eyeball, resulting in remission of the epiphora.

The complete recuperation of the eyelid closure (excellent and good results) was achieved in 34 eyes (66,67%). These results are similar in number and evaluation criterion to the ones reported by Antia (1966)².

Less satisfactory results were recorded by Ranney & Fumess (1973a,b)^{16,17} and Jennings, Joshi, Pandey, Mehta & Antia, (1975)¹⁰. More satisfactory results were presented by Andersen (1961)¹, Lennox (1966)¹³, Guerrero-Santos (1967)⁹, Wintch (1969)²⁰, Miller & Wood (1976)¹⁵, Reichert, (1976)¹⁸, Lemer & Margarido (1978)⁷⁴ and Tjepkema (1984)¹⁹.

Except for Andersen (1961)¹, Antia

(1966)², Lennox (1966)¹³, Ranney & Fumess (1973a,b)^{16,17}, Jennings, Joshi, Pandey, Mehta & Antia (1975)¹⁰ and Tjepkema (1984)¹⁹, who mentioned duration of post-operative follow-up, the others did not^{9,14,15,18,20}.

The observation of follow-up duration is important to evaluate surgical results. Lennox (1966)¹³ verified that many patients who had excellent results in the first post-operative evaluation worsened later, with recurrence of a small eyelid lag.

Jennings, Joshi, Pandey, Mehta & Antia, (1975)¹⁰ also observed cases which had its functional results changed to better or worse than initially.

In our group only 6 (13,33%) of the 45 re-evaluated eyes, after mean of 37 months, had worsening of functional results obtained six months after the surgery. It is possible that the discontinuity of the supervised therapeutic exercises contributed to the worsening.

Although in the great majority of our cases the results were stable, it is important to establish a time frame in which functional results are referred and to orientate patients to do specific exercises every day after hospital discharge.

The exclusive utilization of the degree of corneal protection as an evaluation criterion of functional results is not a consensus among authors. In addition, its rigidity varies from author to author. Besides, in some cases the criteria are not mentioned. This can explain the variation of results mentioned in the literature.

Although in our cases the results were classified according to the degree of corneal protection, the aspects related to ectropium and epiphora were also considered.

Among other factors which influenced the quality of functional results after temporal muscle transfer, Lennox (1966)¹³ and Tjepkema (1984)¹⁹ mention the importance of adequate patient selection and Ranney & Fumess (1973b)¹⁷ state the need for qualified surgeons, persistent physical therapist and cooperating and motivated patients.

Evidence of the importance of these aspects were observed during the follow-up of 2 of our cases, in which there was a need of daily supervised exercises during 120 days to get

complete eyelid closure.

According to Lennox (1966)¹⁵, complete eyelid closure occurred between 2 to 4 weeks after the beginning of post-operative exercises. Among our excellent or good functional result cases the median of time to get complete eyelid closure was 8 and 14 days respectively.

Maintaining supervised exercises until results are sufficiently satisfactory and lasting is time consuming. Besides the exercises are tedious and it is hard to keep the patients interest until the functional re-education program is finished.

These facts lead us to believe that the institution of pre-operative exercises to strengthen the temporal muscle is doubly convenient. It minimizes functional deficit due to surgical trauma and three week post-operative rest and also helps to identify those patients highly motivated and conscious of the post-operative requirements, through the frequent patient-therapist contact.

Regarding the reflex eyelid response to visual stimuli after temporal muscle transfer Ranney & Furness (1973b)¹⁷ observed this occurrence in 2 (3,85%) eyes and Tjepkema

(1984)¹⁹, in 5 (9,4%) eyes. This was not observed in our group.

5. CONCLUSIONS

It is our understanding that the static and functional results obtained confirm the efficiency of temporal muscle transfer (Gillies technique) to reposition the lower eyelid in cases of partial ectropium and recuperate the voluntary eyelid closure.

The surgery promotes lasting and functional results and the median of time to get eyelid closure while biting was 8 and 14 days in cases with excellent and good results respectively.

The study of the effects of temporal muscle transfer on signals and symptoms of eye exposure would allow a more complete evaluation of the benefits of this technique to treat lagophthalmos, since the surgery does not recuperate the involuntary and intermittent reflex blinking.

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