INTERNATIONAL JOURNAL OF LEPROSY

Volume 34, Number 2
Printed in U.S.A.

INTERNATIONAL JOURNAL OF LEPROSY

And Other Mycobacterial Diseases

April-June 1966 Volume 34, Number 2

The Facial Nerve in Leprosy

I. Clinical and Operative Aspects[1, 2]

N. H. Antia, S. C. Divekar and D. K. Dastur[3]

Involvement of the facial nerve in leprosy, and especially of its branch to the orbicularis oculi, is well known, leading, as it does, to isolated paralysis of this muscle and lagophthalmos (7). Involvement of the lower branches of the facial nerve has been reported to be more common in the yellow and white races (9). Facial nerve involvement occurs in about 3 per cent of all cases of leprosy, according to a survey conducted by Diwan (5).

The WHO report mentioned above (9) recommended that a proper study be undertaken to evaluate the cause of facial nerve lesions in this disease. To the best of our knowledge, no report is available of any detailed study of the various aspects of facial nerve involvement in leprosy.

Our two joint papers report a comprehensive study of the facial nerve in leprosy from the clinical, electric, operative and neuropathologic points of view. An attempt has been made to elucidate the pathogenesis of the selective involvement of certain branches of this nerve, since nerve damage at sites of predilection is well known in this disease. In the case of the limbs the areas of maximal nerve damage are at the elbow for the ulnar nerve, at the wrist for the median, at the knee for the lateral popliteal, and at the ankle for the posterior tibial nerve. The practical importance of this investigation arises from the fact that lagophthalmos, especially when prolonged and accompanied by corneal anesthesia, may lead to loss of vision as a result of exposure and consequent mechanical injury and infection.

[1]Received for publication November 3, 1965.
[2]Work conducted under a grant for study of Nerve Lesions in Leprosy, from the Vocational Rehabilitation Administration of the U. S., Dept. of Health, Education and Welfare, Washington, D. C.
[3]N. H. Antia, M.B., F.R.C.S., S. C. Divekar, M.B.B.S., and D. K. Dastur, M.D., M.Sc., Neuropathology Unit Indian Council of Medical Research and Tata Department of Plastic Surgery, Sir J. J. Group of Hospitals, Bombay 8, India.

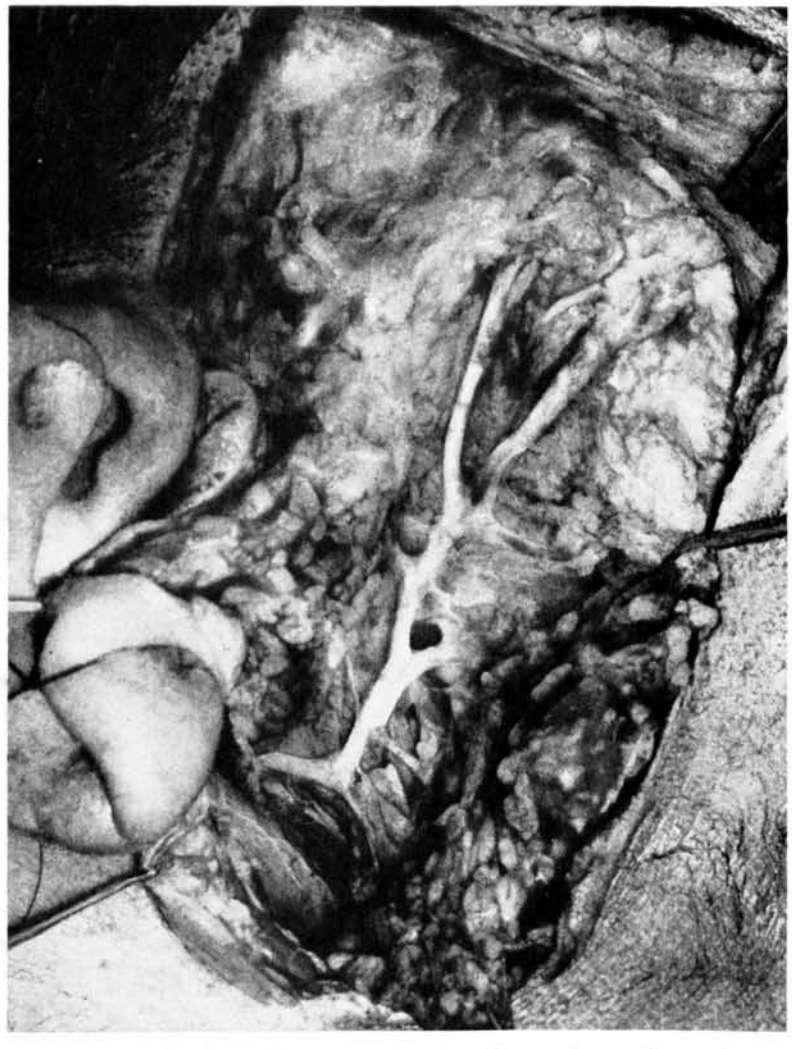

FIG. 1. **Case F-1.** Female aged 25 years. *Type of disease:* maculoanesthetic, polyneuritic. *First lesion:* Hypopigmented anesthetic macule, right cheek, 10 years previously. *Order of nerve involvement:* Both median and ulnar nerves; both lateral popliteal nerves; right facial nerve. *Duration of eye symptoms:* 1 year. *Sensory deficits:* As illustrated above. *Motor deficit:* Right lagophthalmos. *Special features at operation:* (1) Marked thickening of branches to lower eyelid in region of zygoma. (2) Simplest pattern of facial nerve branching. *Operative electric stimulation:* (1) Brisk response of lower facial muscles on trunk stimulation. (2) Branches to lower eyelid unresponsive. *Postoperative course:* Uneventful, temporalis sling effective.

The extensive exploration and study of the nerve at operation, here reported, was possible because all cases had palsy or paralysis of the orbicularis oculi necessitating the surgical repair procedure of a temporalis musculo-fascial sling ([1]).

MATERIALS AND METHODS

The study included 11 cases. All except one had polyneuritic leprosy involving one or more limbs. Seven were classified tentatively as maculoanesthetic, two as probably old lepromatous and two as dimorphous, after examination by the clinicians of the Acworth Leprosy Hospital and by R. G. Cochrane. All of us, however, examined these patients and biopsy specimens from them only at a very late stage of their disease. All were males except one; the ages varied from 25 to 48 years. The duration

of leprosy extended from seven to 20 years and the duration of facial palsy from eight months to ten years. The first nerves involved were the facial in four cases, one of the arm nerves in six cases, and the posterior tibial nerve in one case.

CLINICAL ASPECTS

The relevant details of the clinical features and operative findings are given for each case, while Figures 1-5 demonstrate the operative findings in cases F-1, F-2, F-5, F-10 and F-11, respectively. The preoperative examination included a detailed clinical history, sensory charting, motor function assessment, electric examination, including electromyography, and the lepromin test.

The sensory findings were considered especially important, and are presented separately for each patient. In all cases impairment or loss of cutaneous sensibility was observed in the territory of the maxillary division of the fifth nerve (Fig. 6). Diffuse involvement of the face was observed in five cases and of the malar region only, on the side of the exploration, in the other six. In one patient there was associated sensory loss in the distribution of the ophthalmic branch of the trigeminal nerve, and in one other in the mandibular distribution; corneal sensation was absent in three.

The motor deficit consisted of either total or subtotal paralysis of the orbicularis oculi in all cases. In four of the 11 patients the frontalis muscle also was affected partially or totally, and in three there was associated weakness of the muscles of the cheek.

OPERATIVE PROCEDURES

Nerve exploration procedure. The operation was carried out on all patients under light general anesthesia, with saline infiltration of the subcutaneous tissues of the face at the site of operation to facilitate the dissection. Local anesthesia was avoided, as it would have interfered with the electric stimulation studies during the operation.

The incision was identical to that employed for a face-lift procedure (Fig. 7). The lower half of the incision permitted adequate exposure of the main divisions and branches of the facial nerve and also of the trunk itself. The upper half of the incision permitted the subsequent therapeutic operation of temporalis sling. In all cases the facial nerve was identical in the space between the mastoid process and the ascending ramus of the mandible after it had emerged from the base of the skull. Electric stimulation of the nerve trunk was a valuable aid in its identification, as it was invariably buried deeply in fibro-fatty and parotid tissue in this space. The trunk was identified and hooked, and its two main divisions were traced anteriorly as they disappeared into the mass of the parotid gland. Bailey ([2]) described the superficial and deep part of the parotid gland as constituting the two parts of a tissue sandwich between which pass the branches of the facial nerve. Advantage was taken of this anatomic feature to trace the branches of the upper division into the parotid gland under the superficial lobe. It became obvious to us at the first exploration, however, that these branches could not be traced through their full extent without division of the overlying superficial lobe. Therefore, in all subsequent cases, this was divided obliquely or horizontally along the course of the branches of the upper division in order to achieve the full exposure required for our study. The terminal portions of the superior branches were traced further anteriorly beyond the limit of the parotid gland as far as the cheek, the zygoma, and the temple. This often involved sharp dissection under magnification with a binocular loupe. These branches were frequently seen to burrow into fibrous fascial tunnels, a feature most noticeable with the zygomatic branches and to a lesser degree with the branches to the frontalis. Special attention was paid to dissection of the zygomatic and frontalis branches, these being often traced to their point of entry into their respective muscles, viz., the orbicularis oculi and the lateral part of the frontalis. The zygomatic branches were generally found going to the lower eyelid.

Electric stimulation. In each case the facial nerve trunk and the individual branches were stimulated electrically, using

a square pulse of 0.01 milliseconds' duration delivered through an R.A.F. type 5 stimulator. The poor function or nonfunction of the branch or branches to the orbicularis oculi was confirmed prior to biopsy. In all cases except F-11, where the trunk itself was totally unresponsive, the lower facial musculature reacted briskly. In three of the 11 cases (F-6, F-7, F-8) the frontalis muscle also gave either a poor or no response. In F-3 the branches to the ala nasi and the levator muscle of the upper lip were unresponsive.

Naked eye inspection of the nerves. The trunk and main branches showed no evidence of gross changes in any of the explorations. In three cases (F-1, F-3, F-5) there was definite thickening of the branches to the orbicularis oculi as they passed over the bony prominence of the zygoma (Fig. 1), but adhesions of these branches to the surrounding tissue in the same region were present in all. This was evident in the difficulty in dissection of these branches as compared to that of the other branches of the facial nerve.

Pattern of branching. No uniformity of the pattern of branching was noted in this series (Fig. 8). All patterns consisted of a combination of repeated ramifications and

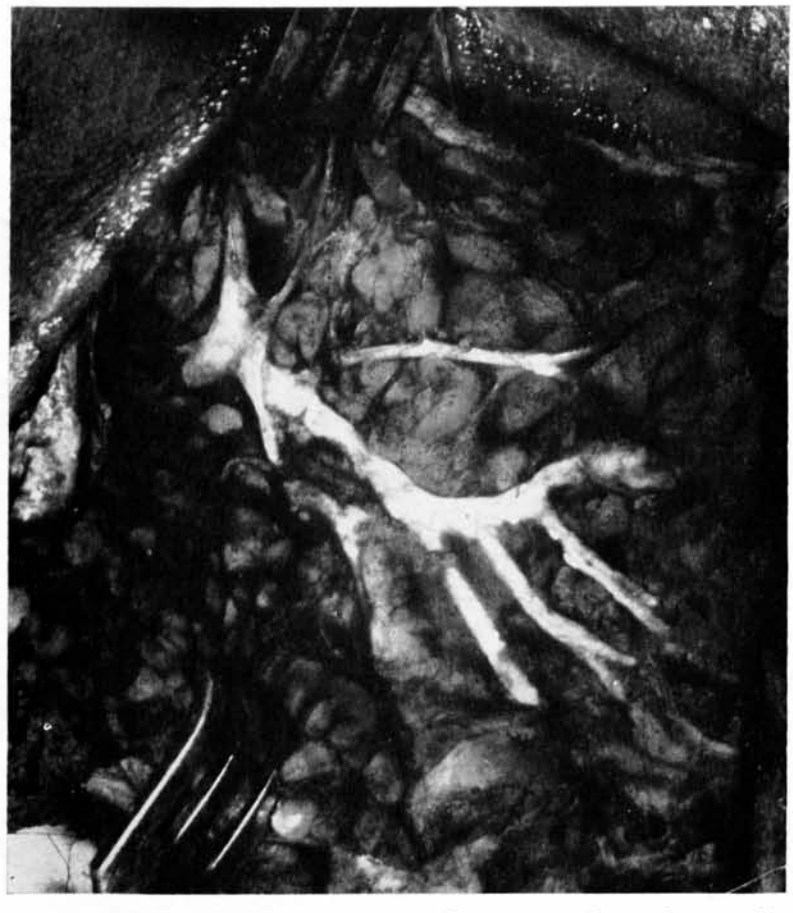

FIG. 2. **Case F-2.** Male aged 38 years. *Type of disease:* maculoanesthetic, polyneuritic. *First lesions:* Hypopigmented macule, left malar region, 8 years previously. *Order of nerve involvement:* Left facial nerve; both lateral popliteal nerves; both ulnar nerves; both median nerves. *Duration of eye symptoms:* 4½ years. *Sensory deficit:* Left lagophthalmos, with exposure conjunctivitis. *Special features at operation:* 2 anastomotic loops in pattern of branching. *Operative electric stimulation:* (1) No response of branches to lower eyelid. (2) Branch 3-a of lower loop, though normal in appearance, was unresponsive. *Postoperative course:* Uneventful; sling effective.

one or more anastomoses of the branches, which varied greatly in each case and ranged from a simple pattern, as shown in F-1 (Fig. 8), to a most complicated network as in F-10 (Fig. 8). Stimulation of the branches often showed a cross-communication between the loops.

Operative complications. Accidental damage to nerves during dissection or coagulation occurred in three instances (twice in F-7, once in F-3).

Biopsy. After electric stimulation and photography, a biopsy specimen of the zygomatic branches, surrounding tissues, and sometimes of the orbicularis muscle, was obtained as a triangular piece, with its apex pointing proximally. In a few cases, biopsy specimens were removed from

FIG. 3. **Case F-5.** Male aged 25 years. *Type of disease:* Dimorphous, polyneuritis. *First lesion:* Faintly hypopigmented patch on right loin, 12 years previously. *Order of nerve involvement:* Both ulnar and median nerves; right posterior tibial nerve; both facial nerves. *Duration of eye symptoms:* 1½ years. *Lepromin test:* Negative. *Sensory deficit:* As illustrated above; mild exposure conjunctivitis. *Motor deficit:* Frontalis weak; orbicularis oculi showed moderate weakness. *Special features at operation:* Perineural adhesions present in relation to superior division, which was thickened over the zygoma. *Operative electric stimulation:* (1) Branches to orbicularis oculi unresponsive (2) Frontalis reacted briskly. *Postoperative course:* Uneventful; epiphora partially improved by temporalis sling.

the frontalis muscle also. From F-11 a biopsy specimen of the facial nerve from the trunk to the main terminal branches was removed *en masse* for study, as this was a case of total facial paralysis of long standing. Skin from the ear lobules was obtained in nine out of 11 cases.

No attempt was made to resuture the divided parotid gland. Following the temporalis musculo-fascial sling operation, the skin incision was closed with interrupted stitches after leaving a glove drain to prevent the formation of a hematoma.

Immediate postoperative complications included the formation of a hematoma in one patient (F-7), total facial paralysis in eight patients (F-3, F-4, F-5, F-6, F-8, F-9, F-10, F-11), and parotid fistulas in four patients (F3, F-6, F-10, F-11). On examination six months to two and a half years postoperatively, however, all the fistulas were found healed; weakness of the frontalis or muscle of the lip persisted though less severely, in seven patients (F-3, F-4, F-5, F-6, F-7, F-8, F-10), but was not incapacitating in any.

The musculo-fascial sling successfully relieved the predominant disability of epiphora in nine of the 11 patients, while failure in the other two patients (F-4, F-8) could be attributed to inadequate tension in one case (the patient was subjected to reoperation with improved result in this case), and postoperative infection in the other.

The following cases in this series are not described in separate figures. See Figures 6 and 8 for facial sensory loss and patterns of facial nerve branching.

Case F-3. Male aged 45 years. *Type of disease:* Old lepromatous, polyneuritic. *First lesion:* Right plantar ulcer, 8 years previously. *Order of nerve involvement:* Right posterior tibial nerve; both ulnar nerves; left facial nerve. *Duration of eye symptoms:* 3 years. *Lepromin test:* Negative. *Sensory deficit:* As illustrated above. Patient was totally blind in the left eye, but had excessive watering. Corneal sensation absent. *Motor deficit:* severe left lagophthalmos. *Special features at operation:* (1) Branches over zygoma thickened and surrounded by adhesions. (2) Branch to lower lid and side of nose accidentally cut. *Operative electric stimulation:* (1) Branch to orbicularis oculi unresponsive. (2) Branch to ala nasi below zygoma also unresponsive. *Postoperative course:* (1) Transient parotid fistula, which closed spontaneously after one month. (2) Mild persistent weakness of levator anguli oris. (3) Temporalis sling sluggish; epiphora persists.

Case F-4. Male aged 44 years. *Type of disease:* Maculoanesthetic, polyneuritic. *First lesion:* Anesthetic patch on dorsum of right index finger, 20 years previously. *Order of nerve involvement:* Both ulnar nerves; both lateral popliteal nerves; both median nerves; right posterior tibial nerve, right facial nerve. *Duration of eye symptoms:* 4 years. *Lepromin test:* Induration 5 mm. *Sensory deficit:* As illustrated above; mild exposure conjunctivitis. *Motor deficit:* right partial lagophthalmos. *Special features at operation:* (1) Some adhesions around zygomatic branches. (2) Respiratory distress with excessive bronchial secretion. Operation concluded as quickly as possible. *Operative electric stimulation:* (1) Branches over zygoma responded feebly. (2) Other branches could not be studied because of respiratory emergency. *Postoperative course:* (1) Pneumonia, right lower lobe; cleared in 2 weeks. (2) Developed mild weakness of frontalis. (3) Inadequate tension on sling at first operation; reoperated with satisfactory result.

Case F-6. Male aged 35 years. *Type of disease:* Maculoanesthetic, polyneuritic. *First lesion:* Hypopigmented macule on anterior aspect of left thigh, 8 years previously. *Order of nerve involvement:* Both ulnar and median nerves; both lateral popliteal and posterior tibial nerves; right facial nerve; left facial nerve. *Duration of eye symptoms:* 3 years. *Lepromin test:* Induration 3.5 mm. *Sensory deficit:* As illustrated above; mild exposure conjunctivitis. *Motor deficit:* (1) Slight weakness of outer part of frontalis. (2) Total lagophthalmos. (3) Fasciculation of zygomatic muscles (4) Slight weakness of cheek muscles. *Special features at operation:* Unremarkable. *Operative electric stimulation:*

(1) Sub-branch pointing to lower eyelid was unresponsive. *Postoperative course:* (1) Small parotid fistula healed spontaneously within 1 month. (2) Marked weakness of frontalis. (3) Moderate weakness of lower lip muscles. (4) Temporalis sling cosmetically and functionally satisfactory.

Case F-7. Male aged 30 years. *Type of disease:* Possibly old lepromatous, polyneuritic. *First lesion:* Small faintly hypopigmented macule, right buttock, and nodules on the chin 14 years previously. *Order of nerve involvement;* Left median and ulnar nerves; right median and ulnar

FIG. 4. **Case F-10.** Male aged 27 years. *Type of disease:* Maculoanesthetic. *First lesion:* Hypopigmented macula, left shin, 14 years previously. *Order of nerve involvement:* Left facial nerve only. *Duration of symptoms:* 6 years. *Lepromin test:* Induration 3 mm. *Sensory deficit:* As illustrated above; chronic exposure conjunctivitis. *Motor deficit:* Moderate lagophthalmos. *Special features at operation:* (1) Most complex pattern of facial nerve branching in this series. (2) Fascial tunnels around distal branches and subbranches were more fibrous than proximally. *Operative electric stimulation:* (1) Poor response of muscle of eyelids and side of nose. (2) Certain branches to the frontalis also gave a feeble response. *Postoperative course:* (1) Small retroauricular parotid fistula, healed in 4-6 weeks. (2) Minimal weakness of frontalis. (3) Moderate weakness of lower lip and angle of the mouth. (4) Epiphora and conjunctivitis satisfactorily relieved by temporalis sling.

nerves; right facial nerve. *Duration of eye symptoms:* 8-9 months. *Lepromin test:* Negative. *Sensory deficit:* As illustrated above. *Motor deficit:* Right partial lagophthalmos; slight asymmetry of nasolabial folds. *Special features at operation:* (1) Accidental coagulation of branch to frontalis and orbicularis oculi. (2) Branch to upper lip also accidentally damaged. (3) Definite adhesions around the upper branches. *Operative electric stimulation:* Because of coagulation damage, the electric stimulation of the orbicular branches could not be studied adequately. *Post-*

FIG. 5. **Case F-11.** Male aged 38 years. *Type of disease:* Maculoanesthetic, polyneuritic. *First lesion:* Faintly hypopigmented anesthetic macule on left side of forehead and face, 7 years previously. *Order of nerve involvement:* Left facial; left ulnar and median nerves. *Duration of eye symptoms:* 5 years. *Lepromin test:* Induration 3 mm. *Sensory deficit:* As illustrated above; corneal sensation absent. *Motor deficit:* Total paralysis of all left facial muscles except platysma, which was very weak. *Special features at operation:* (1) The nerves over the zygoma were lying in dense adhesion and fascial tunnels. (2) Trunk, main divisions and branches excised *en masse*. *Operative electric stimulation:* (1) Trunk and main divisions unresponsive except for feeble twitch of frontalis and orbicularis oris. (2) Auricularis muscle gave brisk response. *Postoperative course:* (1) Developed subcutaneous salivary collection, which had to be opened into the mouth. Infection adequately controlled. (2) Masseter sling failed as result of complication noted above.

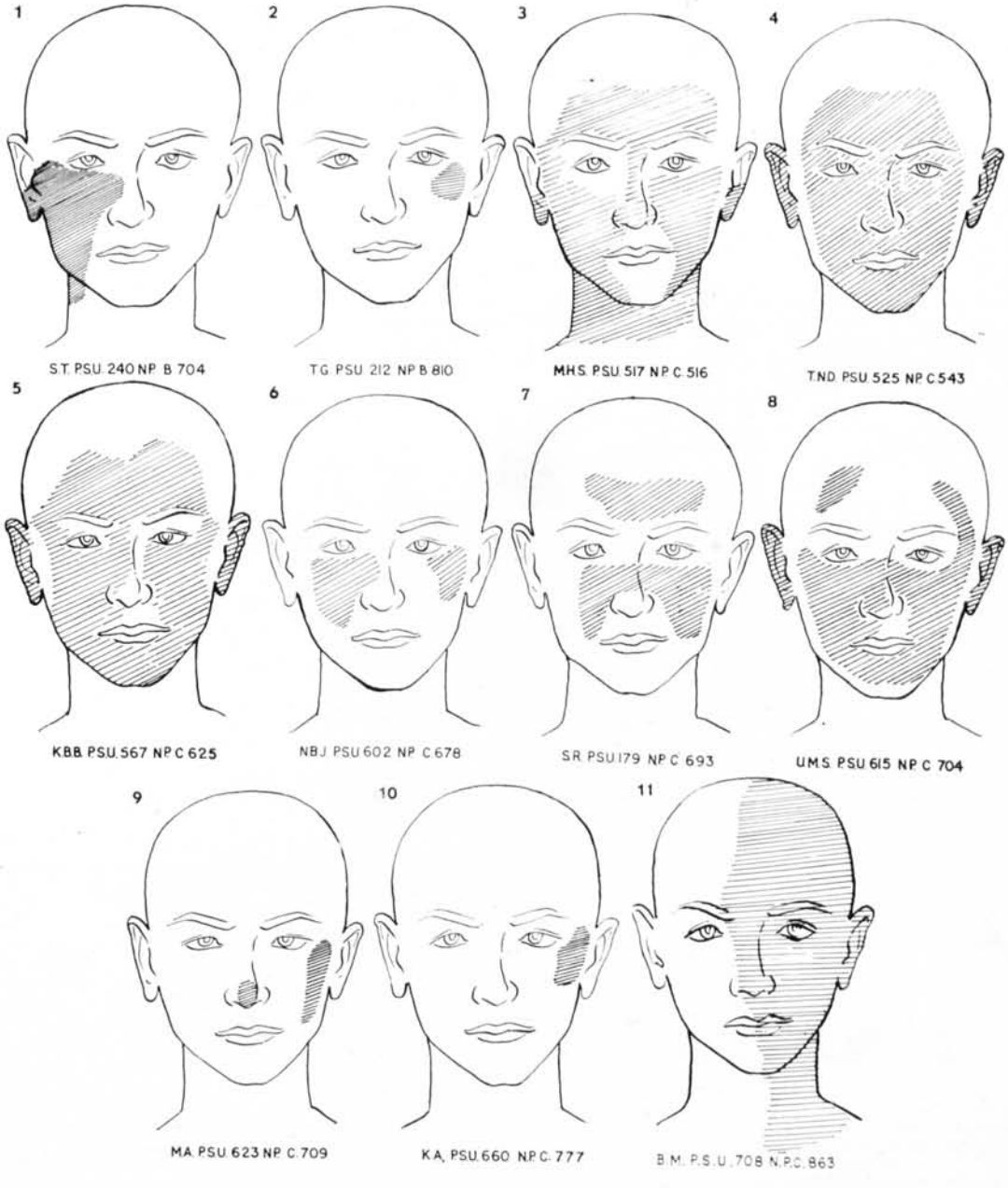

FIG. 6. Extent of facial sensory loss seen in this series; the territory of distribution of the maxillary division is constantly involved.

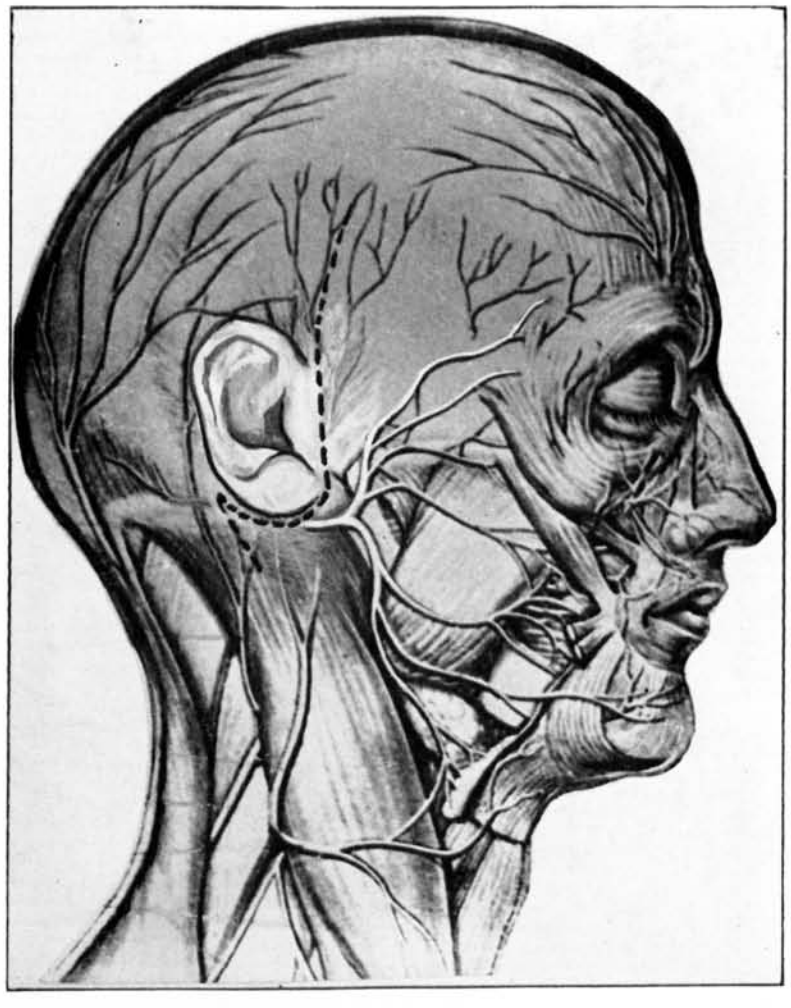

FIG. 7. The incision for our operation is indicated by the dotted line. Facial nerve branches as illustrated in Gray's Anatomy. Note the anastomoses of the palpebral branch of the maxillary nerve with the zygomatic branch of the facial nerve in the infraorbital region.

operative course: Complete paralysis of frontalis muscle. Temporalis sling action effective.

Case F-8. Male aged 45 years. *Type of disease:* Probably old dimorphous, polyneuritic. *First lesions:* Macular hypopigmented patches on upper chest and back, 12 years previously. *Order of nerve involvement:* Right ulnar and median nerves; both lateral popliteal nerves; right posterior tibial nerve; left facial nerve; right facial nerve. *Duration of eye symptoms:* 5 years. *Lepromin test:* Negative. *Sensory deficit:* As illustrated above. Corneal sensation absent. *Motor deficit:* (1) Marked weakness of frontalis. (2) Total lagophthalmos. (3) Moderate weakness of cheek and upper lip. *Special features at operation:* (1) Superior branches in the zygomatic region found in dense fibrous tunnels, in which they were probably constricted. *Operative electric stimulation:* (1) Branch to frontalis and orbicularis oculi unresponsive. (2) Feeble response of branch to side of mouth. *Postoperative course:* (1) Postoperative infection at

medial canthus; temporalis sling failed. (2) Increased weakness of muscles of upper lip.

Case F-9. Male aged 48 years. *Type of disease:* Maculoanesthetic, polyneuritic. *First lesion:* Small faintly erythematous macule on left forearm, 20 years previously. *Order of nerve involvement:* Left facial nerve; right ulnar and median nerves; right posterior tibial nerve; right lateral popliteal nerve. *Duration of eye symptoms:* 10 years. *Lepromin test:* Induration 4 mm. *Sensory deficit:* As illustrated above. *Motor deficit:* (1) Weakness of frontalis, especially medial fibers. (2) Moderate lagophthalmos. *Special features at operation:* Unremarkable. *Operative electric stimulation:* (1) Branches to orbicularis oculi were unresponsive. *Postoperative course:* (1) Patient had marked facial palsy for 1½ months postoperatively, which recovered with minimal residual frontalis and lower facial weakness. (2) Satisfactory result of temporalis sling.

DISCUSSION

Operative technic. Three technics have been described for exposure of the facial nerve at operation: (1) locating the major trunk as it emerges from the base of the skull and progresses peripherally, (2) exposing and following the mandibular branch proximally to the main trunk, and (3) exposing the terminal branches anterior to the parotid gland and tracing them proximally. We followed the first method in all our cases and found it quite adequate for dissection of the trunk, divisions and branches. In retrospect we feel this is the method of choice because of the wide variety and unpredictability of the pattern of the facial nerve branching that one encounters. This point will be amplified further during detailed consideration of the anatomic pattern encountered. Identification of the trunk of the facial nerve as it lies buried in the dense fibro-fatty tissue between the anterior border of the sternomastoid and the posterior border of the mandible is definitely facilitated by the use of electric stimulation early in the operation. Another aid during the phase of the face-lift procedure is infiltration with normal saline in the correct layer between the skin and the underlying facial tissues. Not only does it facilitate introduction of the dissecting scissors, but it helps also in the later stages to display the plane of the terminal branches of the nerve. This saline infiltration also reduces persistent capillary oozing, which hampers dissection and may lead to damage of the branches in any attempt to produce hemostasis. An added advantage in the operative technic during the stage of dissection of the final terminal branches is the use of a binocular loupe, which magnifies about two or three times.

Anatomy. When a start is made with the simple branching of the facial nerve illustrated in a standard textbook, such as Grey's Anatomy ([6]) (Fig. 7), increasingly complex anastomotic patterns may be encountered. For example, McCormack *et al.* ([8]) and Davis *et al.* ([4]) attempted to describe the more complex patterns of branching and anastomoses as so many subtypes. Our experience, though limited to 11 cases, does not seem to justify the delineation of set patterns. No resemblance was observed in the complex branching between any two of our cases, and it seems to us artificial to subtype them. In fact the notion of a set pattern may mislead the surgeon during dissection and result in inadvertent damage to one or more branches.

As indicated in the description, the overall picture of branching of the facial nerve appeared to be a complex assortment of repeated dichotomizations, together with one or several small or large interconnections or anastomoses. The latter may have physiologic implications. For example, in F-2 (Fig. 2) a prominent part of a loop facing the upper lip showed total lack of response to electric stimulation, although stimulation of the branches arising in continuity from it showed an active response. Incidentally, this fact also highlights the value of electric stimulation in facial nerve exploration, helping, as it does, to identify the pathologically affected branches or loops.

Electric stimulation at operation. The practical utility of electric stimulation in these studies was shown by the fact that it confirmed indubitably the clinical impression of the status of the affected muscle

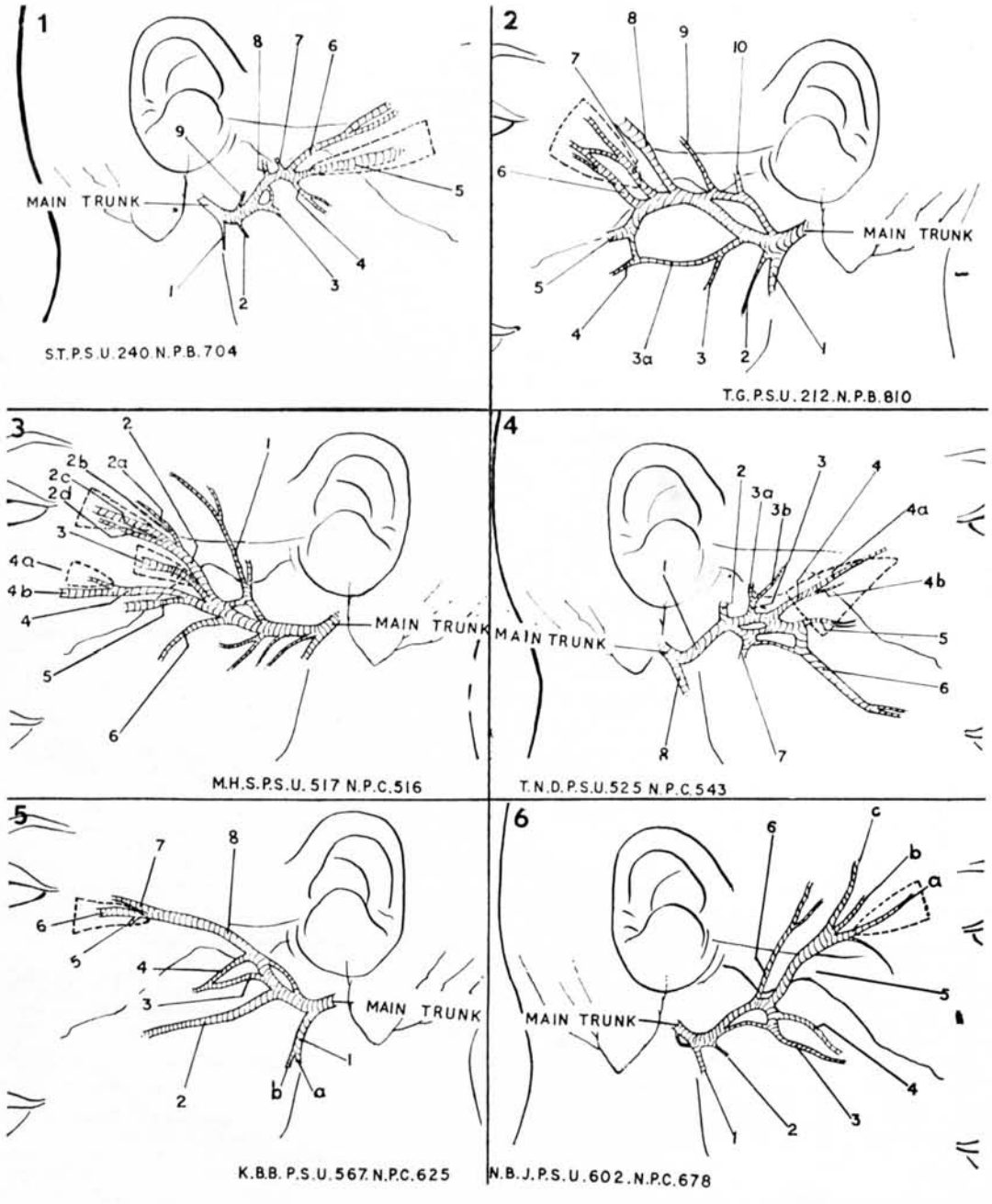

FIG. 8. Line drawings of the varied patterns of facial nerve branching encountered in this series.

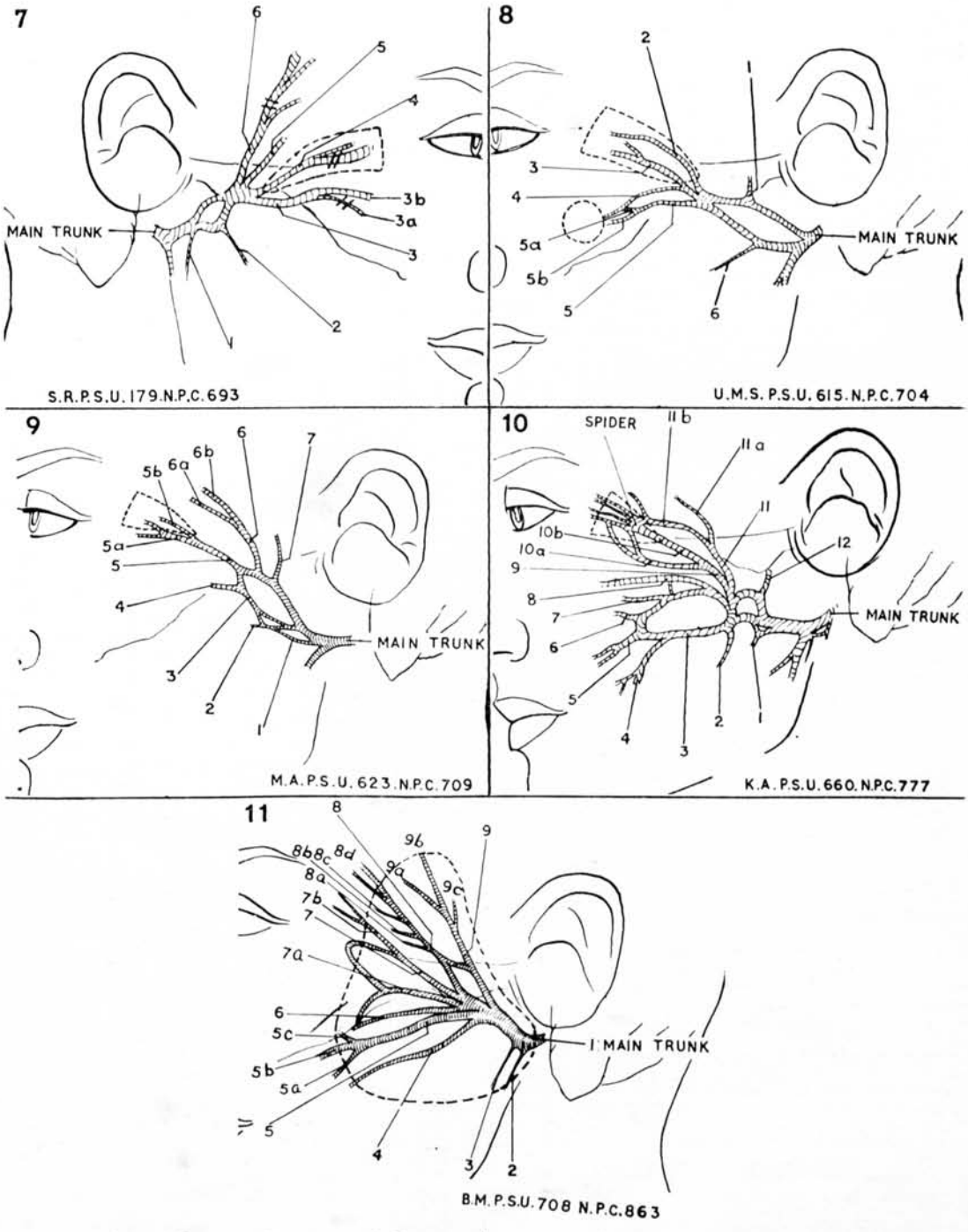

FIG. 8 (Cont'd) Line drawings of the varied patterns of facial nerve branching encountered in this series.

and nerve branches, thus permitting us to delineate the extent of the nerve and muscle biopsy.

Naked eye appearance of nerves. It is interesting to note that in only three of our 11 cases was there any thickening even of the electrically affected branch or branches. Even in the last case, where the trunk itself was unresponsive to stimulation and the patient had a total left sided facial paralysis, no visible abnormality of the nerve was seen at operation, nor was there any palpable thickening of it. These observations indicate that it would be misleading to try to assess the status of these nerves on naked eye appearance alone.

More than the gross appearance of the nerve branches at operation, it was the condition of the tissues surrounding these branches which showed significant changes in the majority of cases. These changes took the form of thickening of the fibrofatty tissue especially surrounding the final ramifications, particularly over the region of the bony zygoma, taking at times the form of fibrous tunnels in the plane of the fascia. The nerve branches so affected were frequently found adherent to this surrounding fibrous tissue, requiring sharp dissection. At times this gave us the impression that these branches were being compressed in the fibrous tunnels and planes. It is not inconceivable that in the acute stages of the disease, when the nerves would be expected to be swollen, there would have been even greater compression.

We could not but be impressed by the fact that the most frequently and severely affected branches were those leading to the lower eyelid, and the one anatomic feature that seems peculiar to them was the background constituted by the bony prominence of the zygoma underlying them. These branches were subsequently found to be structurally damaged also, as described in the following paper ([3]).

In all cases there were one or two branches running laterally to the eyebrow and pointing to the frontalis muscle. In a number of cases it was observed, on electric stimulation of these branches, that one of them would appear to innervate the outer part of the frontalis muscle and the other the inner part of this muscle, thus indicating a separate nerve supply to these parts.

SUMMARY

Detailed clinical features, surgical observations, and gross morphologic findings are reported for 11 patients with polyneuritic leprosy, who presented with lagophthalmos with or without weakness of other facial muscles.

All patients showed greater or lesser areas of anesthesia in the distribution of the maxillary division of the trigeminal nerve.

An extensive operative exposure, electric stimulation, and biopsy of the affected nerve branch, were possible as measures preliminary to surgical repair of the palsied eyelids.

In no two cases was the pattern of facial nerve branching identical; different forms of dichotomizations and anastomoses were encountered.

In accord with the clinical impression, the zygomatic branch of the facial nerve was found most affected and invariably unresponsive to electric stimulation; it was the one biopsied, and the biopsy specimen included the surrounding tissues.

Adhesions, and frequently compression of the zygomatic branches in the surrounding tissues, which appeared fibrosed, were observed.

RESUMEN

Se presentan los hallazgos en 11 pacientes con lepra polineurítica con detallada historia clínica, observaciones quirúrgicas y morphología macroscópica, los cuales presentaron lagoftalmos con o sin debilidad de otros músculos faciales.

Todos los pacientes mostraron mayores o menores áreas de anestesia en la distribución de la división maxilar del nervio trigémino.

Fueron posibles como medidas preliminares a la reparación de los parpados paralizados, una extensa exposición operatoria, estimulación eléctrica y biopsia del ramo nervioso afectado.

No hubo dos casos en el que los cuadros de las ramas del nervio facial fueran identicas; formas de dicotomización y anastomosis fueron encontradas.

De acuerdo con la impresión clínica, la rama

zigomática del nervio facial fué afectado mas veces e invariablemente insensible a la estimulación eléctrica; fué el uno biopsiado, y el espécimen de la biopsia incluyó tejidos vecinos.

Fueron observados adherencias, y frecuentemente compresiones de las ramas zigomáticas en los tejidos vecinos, los cuales aparecían fibrosados.

RÉSUMÉ

On présente ici les caractéristiques cliniques détaillées, les observations chirurgicales et les observations morphologiques macroscopiques relevées chez 11 malades souffrant de polynévrite lépreuse, et également atteints de lagòphthalmos avec ou sans faiblesse des autres muscles faciaux.

Tous ces malades présentaient des zones plus ou moins étendues d'anesthésie dans le doraine de la division maxillaire du nerf trijumeau.

Les mesures qui ont pu être employées pour préparer la réparation chirurgicale des paupières paralysées ont consisté en une exposition opératoire étendue, stimulation électrique et biopsie de la branche nerveuse atteinte.

Le schéma d'embranchement du nerf facial a toujours été trouvé différent d'un cas à l'autre. On a rencontré des formes différentes de dichotomie et d'anastomoses.

En accord avec l'impression clinique, on a observé que la branche zygomatique du nerf facial était la plus ateinte, et de manière constante était insensible à la stimulation électrique. C'était celle qui avait été biopsiée, et l'échantillon pour la biopsie avait englobé les tissus adjàcents.

On a observé des adhérences, et souvent une compression des branches zygomatiques dans les tissus adjacents qui appraissaient fibrosés.

Acknowledgment. We thank Shri S. G. Kamat for his help in photography and preparation of diagrams.

REFERENCES

1. Antia, N. H. Scope of plastic surgery in Leprosy. Trans. Internat. Soc. Plastic Surg., 1959. E. & S. Livingston Ltd., 1960, pp. 547-555.
2. Bailey, H. Treatment of tumours of the parotid gland, with special reference to parotidectomy. Brit. J. Surg. **28** (1941) 337-346.
3. Dastur, D. K., Divekar, S. C. and Antia, N. H. The facial nerve in leprosy. 2. Pathology, pathogenesis, electromyography and clinical correlations. Internat. J. Leprosy **34** (1966) 118-138.
4. Davis, R. A., Anson, B. J., Budinger, J. M. and Kurth, L. E. Surgical anatomy of the facial nerve and parotid gland based upon a study of 350 cervico-facial halves. Surg., Gynec. & Obst. **102** (1956) 385-412.
5. Diwan, V. S. A survey of deformities in leprosy (with special reference to face). Leprosy Rev. **33** (1962) 255-262.
6. Gray's Anatomy. Section on Neurology. Edited by T. B. Johnson and J. Whillis. London, Longmans, Green & Co., 31st ed., 1954, pp. 1106-1108.
7. Kirwan, E. W. O'G. Ocular leprosy. Proc. Roy. Soc. Med. **48** (1955) 112-117.
8. McCormack, L. J., Cauldwell, E. W. and Anson, B. J. The surgical anatomy of the facial nerve with special reference to the parotid gland. Surg., Gynec. & Obst. **80** (1945) 620-630.
9. [World Health Organization] Scientific Meeting on Rehabilitation in Leprosy, Vellore, India, 1960. WHO Technical Report Series No. 221, 1961.