

THE UTILIZATION OF THE TEMPORAL MUSCLE AND FASCIA IN FACIAL PARALYSIS

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THE temporal muscle and fascia can be utilized to give anchorage for fascial strips in facial paralysis, and some degree of emotional expression may be developed, if the patient will train the newly substituted fifth nerve muscle and will avoid overactivity of the sound side of the face (Figs. 1, 2 and 3).

Mechanical support, of course, should not be relied upon when nerve anastomosis is possible; but, where the distal branches of the nerve have been torn out—in partial paralysis where it is thought definitely best not to disturb the function already present—and in congenital paralysis, the operation outlined herein is applicable.

Summary of Previous Work.—For direct nerve suture and free nerve transplant, the work of Ballance and Duell has developed much interest in the past few years. Anastomosis with other motor nerves has been effected by many surgeons and the photographs of patients that showed excellent emotional expression have been recorded.

Eden, in 1911, and Gillies, in 1917, used strips of temporal fascia turned downward over the zygoma to support the face. J. S. Davis, in 1911, and Gallie and Le Mesieur, in 1923, published the results of extensive work on the free transplantation of fascia, and the first report of free fascial strips to support the paralyzed face was made by Blair in 1926. Since this time, descriptions have been made of various methods of fixation of the fascial strips, of use of the opposite frontalis and of flaps of the masseter and temporal muscles from the same side.

Operation for Combining Temporal Muscle and Free Fascia Support.—After consideration and observation of these different methods, a combination plan of operation was developed, in which free fascial strips are put subcutaneously through the face and are anchored directly into the temporal muscle and fascia through an opening in the temporal region (hair-bearing area) (Figs. 1 and 2).

Technic of Obtaining Fascia.—Careful removal of very long strips of fascia lata is accomplished with the Masson or other suitable stripper. An incision is made above the knee about 6 cm. long, and the subcutaneous tissue is carefully separated from the fascia upwards, the length of the dissecting scissors; this separation helps in getting the stripper started. At times there are a good many transverse fibers as a separate layer over the longitudinal fibers, and these can be opened through, as they are of no benefit and hinder the action of the stripper. Three or more strips about 1 cm. wide are re-

moved, it being very advantageous to have them long enough for a complete loop through the face and anchorage in the muscle. Therefore, the removal is started quite low and carried all the way up to the tensor fascia femoris. The 1 cm. width may seem wide, but when it rolls up on manipulation, its bulk does not seem too great.

The leg wound is closed without drainage and a firm bandage put on through the full length of the fascial removal. No objective or subjective trouble has been noted by the author, although others have reported occasional trouble with muscle herniation.

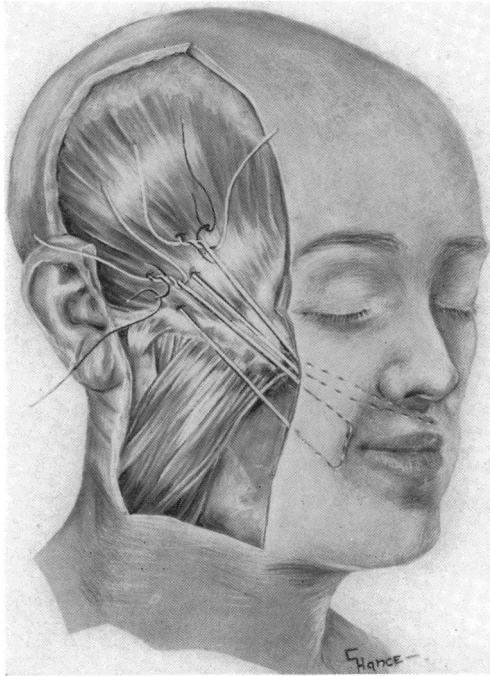


FIG. 1.—Diagram of the free fascial loops' course through the face and fixation in the temporal muscle.

It is possible to use homografts of fascia successfully, and preserved fascia has been employed, but the operation for removal of autografts is simple enough to warrant their use routinely.

Operation on Face.—Diagrammatic course of the fascial strips is shown in Figure 1, and the scar of operation in Figure 2-E.

A slightly curved incision is made in the hair-bearing temporal region about 6 cm. long, and the temporal fascia is almost completely exposed by retraction.

With a long needle, a loop of fascia is threaded from this wound through the subcutaneous tissues of the face and back up through a second different channel into the temporal wound again. To make the loop on the upper lip the needle is brought out through a stab hole in the philtrum or a little to

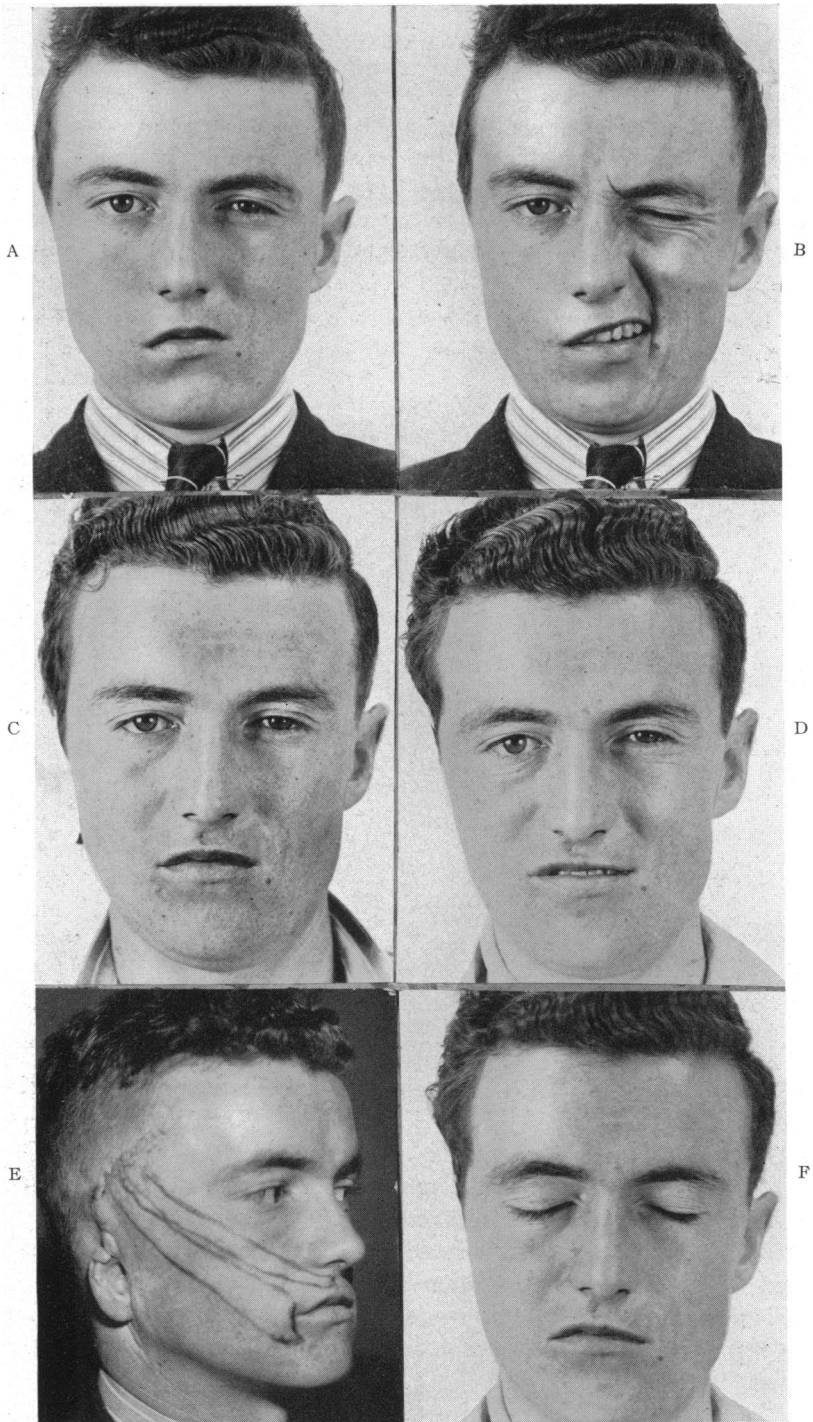


FIG. 2.—(A, B) Traumatic facial paralysis in which nerve repair was impossible.
 (C, D) Result of one stage operation as described here, with good facial level and some emotional expression. Patient stated that he attended college with very few persons knowing his face was paralyzed.
 (E) Operation scar and course of tendons through face.
 (F) Good closure of eye, obtained by elevating face without putting separate fascial loop through lid. This is also helped by performing the operation before excessive sagging has taken place. (The flap on the neck is for reconstruction of the ear.)

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the opposite side. The two courses of the needle through the face are easier if made from above downward. The two ends of the fascia can now be worked back and forth in the temporal wound to establish their firmness and then the lip position can be held straight by the loop. A second loop is



FIG. 3.—(A) Complete facial paralysis—congenital.
(B) Result of the described operation showing motor power of the (fifth nerve) temporal muscle elevating the lip in a slight smile to give some degree of emotional expression.
(C, D) Later photographs to show persistence of result and also improvement in control of the face and in emotional expression.

now put in as illustrated with an extra curve around the angle of the mouth and, in heavily drooped faces, other loops may be necessary to the ala and farther across under the lower lip.

Anchorage in the Temporal Muscle.—When all loops are in place, one

strand of each is carried through the temporal fascia all the way down through the muscle and out again through the fascia 1 to 2 cm. distance. The loops are then pulled tight to over-correct the face quite noticeably, the first part of a surgeon's knot is put in the loops and they are clamped with two mosquito forceps. Then fixation is firmly effected with three or four No. 000 silk sutures put through the loops and tied around them. An effort should be made to get a secure hold on the muscle in a region where there is the most movement and this is close to the attachment to the coronoid. It might be thought best to completely free the tendon from the coronoid and bring it out for direct attachment to the fascial strips, but this simpler procedure should suffice and the nerve supply is less apt to be sacrificed. (Turning

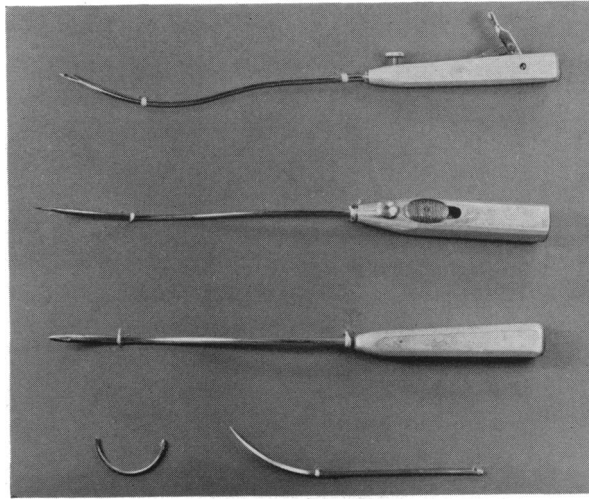


FIG. 4.—Various needles for threading fascia through face. First and third: Type of needles used by Blair. Second: A modification of the first needle by Smith. Below: A long post-mortem type of needle for going through face and a full curved fascial suture needle for anchorage in the temporal muscle.

muscle flaps down from the parietal bone seems quite apt to damage the nerve supply) Figs. 1 and 2-E.

The needles used are illustrated in Figure 4, and it is best to have an eye in the pointed end as there is in the Reverdin needle and in the hollow-tube type used by Blair. If the postmortem type is used, the fascia may have to be attached to it with a long, heavy thread and this needle has to be threaded through, one time, from the lip to the temporal region.

For putting the loops into the muscle a needle of the Reverdin type can be used, or one of the heavy, full-curved fascial type, as illustrated, makes a good curve into the depth of the fossa.

Fascial loops for elevating the lower eyelid are not put deep into the muscle but are fastened into the temporal fascia as the approximation of the lid to the globe should be present at all times and not depend on any conscious muscle activity.

When the fascial loops are all completed, the skin flap is closed, and at this stage if there is much excess skin present, as there is apt to be in long-standing cases, it may be excised along the margin after pulling the anterior flap up tightly and determining the amount of excess. This will necessitate extending the incision down over the crus of the helix and tragus and undermining the skin quite far out on the cheek. When this is all accomplished, the result is that the deep tissues are elevated and attached to the masseter muscle; the excess facial skin has been excised and the skin reattached to the scalp for fixation. There is almost always better approximation of the lower lid to the globe because of the elevated face, even if there has been no tendon loop put in the lower lid (Figs. 2 and 3).

Badly drooped cheeks in patients with thick skin and subcutaneous tissue may need to have the excess skin removed at a second operation because it sometimes has to be elevated so far and the wound edges held so tight that healing is delayed; and that is, of course, not desirable over the freshly transplanted tendons. For this reason, if possible, the operation for support of the face should be performed before marked sagging has taken place.

Tendon transplants do not stand infection well and every effort should be made for a clean operation even though it is carried out right at the mouth opening. Intratracheal anesthesia with the tube coming out the opposite angle of the mouth is probably the best.

Postoperative Course.—A large pressure dressing, using either marine sponges or fluffed mechanic's waste, is put over the entire side of the face including the eye, after strapping it shut with adhesive. Chewing is prohibited. After several days the face can be held supported with collodion and fine mesh gauze which is fastened along the lips and cheeks and then in the temporal region above the incision. This can be kept on two to three weeks and then activity allowed. There may be a long period of swelling and the overcorrection may seem annoying, but secondary adjustments are usually for tightening rather than loosening the tendons.

Results of Surgical Treatment.—With subsidence of the swelling, the face usually smooths out and the tendons can be felt in the cheek. Electrical stimulation of the facial muscles can be maintained if desired, but, if the tendons work well, the tone of the face seems to be satisfactory. After some weeks, the conscious muscle activity of setting the closing muscles of the jaw should come into play and give some degree of emotional expression (Figs. 2 and 3).

Facial Muscle and Speech Training.—One of the most important points, for a successful outcome, is that the patient should train his facial movements. This includes the use of the newly attached fifth nerve muscle which will produce a slight smile and a nasolabial fold on a slight setting action of this closing muscle; and, of equal importance, is learning not to overact on the sound side. It seems that many people with facial paralysis, in speech and laughter, throw about twice as much movement into the sound side of the face as they probably would if both sides were working. Therefore, a fun-

damental of the training might be for these patients to try to become rather "glum," and work from this point towards a limited movement on the sound side and an involuntary or subconscious setting of the fifth nerve muscles on the repaired side, in smiling. Of course, sudden emotions will always register mainly on the sound side; there is probably no way of controlling this, and it would be the same even with a successful nerve anastomosis.

If there are other speech defects, such as lisping, training by a professional should be of great value, because everything that will help to prevent other persons noticing the face of one of these patients is desirable.

Eye Involvements.—As has been mentioned before, some elevation of sagged lower lid is obtained by the operation on the face (Fig. 2-F). If it needs further support, a single fascial loop can be put through the lid and

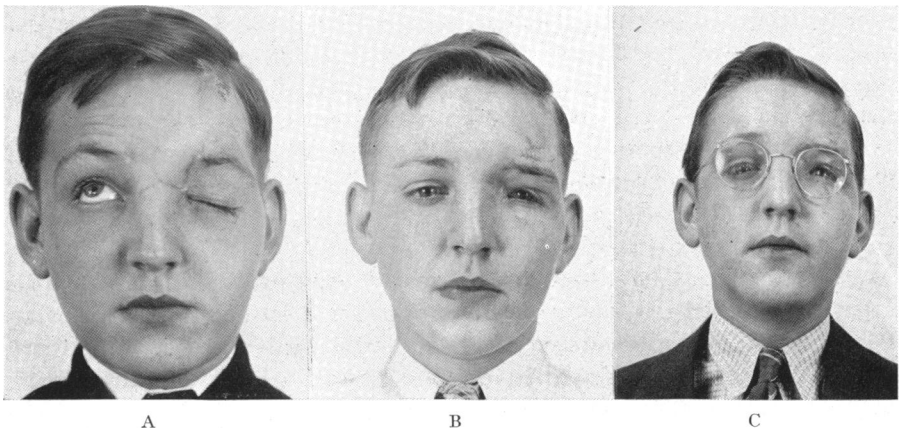


FIG. 5.—(A) Complete ptosis of the upper lid, from a third nerve lesion and paralysis of the frontalis (seventh nerve) muscle from the local scar.

(B and C) Elevation and some degree of emotional expression in the lid by attachment of lid to the forehead with fascia and by a second loop of fascia from the temporal fascia through the tarsus to the opposite functioning frontalis.

held on each end, above in the opposite frontalis—which may give some slight emotional expression—and on the outside in the temporal fascia.

Heavy drooping brows may be raised by extending the skin incision over the forehead, undermining down to the brow, elevating and excising the excess skin, and reattaching it to the scalp.

For the apparent exophthalmos a small external canthoplasty can be performed to narrow the opening. Cervical sympathectomy has been recommended to procedure the enophthalmos of a Horner's syndrome, but this procedure would be contraindicated if there were already a heavy overcast eyebrow.

When ptosis of the upper lid exists with seventh nerve paralysis, the problem of getting the lid elevated becomes very acute. If an extra-ocular muscle operation will not suffice, the lid can be elevated with a single loop of fascia from the temporal fascia, through the tarsal border of the lid, across to the opposite frontalis. An extra loop may be necessary to help in the

elevation and may be attached above to the inert tissue in the forehead. This implies that the lid will be held open all the time, and trouble with the cornea will result if it is not kept protected carefully (Fig. 5).

The use of fifth nerve muscles is not recommended in trying to get elevation of the upper lid because of giving movements that would appear too gross and too conscious.

DISCUSSION.—DR. WALTER E. DANDY (Baltimore, Md.): I have been very much impressed with the brilliant results of Doctor Brown in this field. His contribution is, I think, the insertion of the fascia into the temporal muscle. I have often wondered whether this might not be a better treatment of those cases of facial paralysis where a nerve transplant is the usual procedure. I wonder if these results may not actually be superior to an anastomosis of the spinal accessory or hypoglossal nerves which would then not be sacrificed. Certainly the results are very good. I have performed a few of them and have been much impressed with the muscular control which one can get through the use of the temporal muscle.

DR. JAMES BARRETT BROWN (St. Louis, Mo., in closing): I am not qualified to evaluate the end-results of nerve anastomosis, but many very worthwhile results have been published. In those patients not suitable for nerve anastomosis, the operation described here may give the most satisfactory result.

There have been descriptions of fifth nerve muscle flaps from the temporal and masseter to the eyelids, but when approximation of the lid to the globe is such a constant necessity, it seems improbable that fifth nerve muscles would afford much comfort. It is probably best to fasten support in the temporal fascia, carry it through the lid and anchor it near midline or even up in the opposite frontalis.