

# RECONSTRUCTIVE SURGERY OF THE EYELIDS

BY

WENDELL L. HUGHES, M.D., F.A.C.S.

Hempstead, New York

WITH 268 ILLUSTRATIONS

SECOND EDITION

ST. LOUIS

THE C. V. MOSBY COMPANY

1954

# CONTENTS

	PAGE
INTRODUCTION - - - - -	17
CHAPTER I. EARLY DEVELOPMENT OF SKIN GRAFTING	18
Replacement of Epithelial Layers - - - - -	18
Mutilations - - - - -	18
Celsus Method - - - - -	19
First Tarsorrhaphy - - - - -	19
Early Rhinoplasty. Indian Method - - - - -	20
Celsus Flaps - - - - -	20
Italian Method - - - - -	21
First Blepharoplasty - - - - -	24
Dieffenbach: Father of Plastic Surgery - - - - -	24
Fricke Pedicle Grafts for Blepharoplasty - - - - -	24
Procedures by Contemporary Spanish Surgeons - - - - -	26
Modifications of Pedicle Flaps - - - - -	28
Excision of Triangle at Base of Pedicle - - - - -	30
Circular Celsus Flap and Excision of Triangle - - - - -	32
V-Y Procedure - - - - -	32
Blepharorrhaphy and Tarsorrhaphy - - - - -	32
Double Celsus Method - - - - -	39
CHAPTER II. DEVELOPMENT OF GRAFTING WITHOUT A	
PEDICLE - - - - -	40
Early Animal Experimentation - - - - -	40
Early Reports of Healing-on of Detached Parts - - - - -	40
Reports of Free Grafts Before Reverdin - - - - -	41
Early Indian - - - - -	41
Dzondi - - - - -	41
Bünger - - - - -	41
Dieffenbach - - - - -	41
Laugier - - - - -	41
Reverdin on Use of Pinch Grafts - - - - -	42
Free Full-Thickness Grafts - - - - -	43
Le Fort - - - - -	43
Sichel - - - - -	43
Wolfe - - - - -	44
North American Surgeons - - - - -	45

RECONSTRUCTIVE  
SURGERY OF THE EYELIDS



# RECONSTRUCTIVE SURGERY OF THE EYELIDS

BY

WENDELL L. HUGHES, M.D., F.A.C.S.

Hempstead, New York

WITH 268 ILLUSTRATIONS

SECOND EDITION

ST. LOUIS

THE C. V. MOSBY COMPANY

1954



FIG. 6



FIG. 7

Fig. 6.—Original illustration of case of severe ectropion operated on by Fricke.  
Fig. 7.—Original illustration of same case after operation.

below the medial canthus to about one centimeter beyond the temporal canthus and about two and five-tenths centimeters down on the cheek, its greatest width below the temporal canthus (Figs. 53 and 54). The growth had been enlarging lately. The diagnosis, later corroborated by microscopic examination, was basal cell carcinoma.

*Treatment:* The entire area was widely excised making the incision in normal tissue surrounding the involved area. Two intermarginal adhesions were made and the entire skin of the opposing upper lid was removed with as little subcutaneous areolar tissue as possible (Fig. 55). This was sewn by fine, closely placed sutures over the denuded area from which the malignant tissue had been removed (Fig. 56). A piece of sterofil porgee was placed over this area and a pressure dressing was applied. This was left in place for five days and the dressing was changed every five days thereafter for three weeks. The intermarginal adhesions were left intact for four months.

The upper lid skin stretched out. There was a little contraction of the lower lid because one of the lid adhesions was not as sturdy as it should have been. The new area, however, was a good color and texture match. No lash transplant was done since the patient was satisfied with the achieved result (Figs. 57, 58, 59, and 60).

In an effort to replace the mucocutaneous junction of the lid, Glezerov<sup>236</sup> (1933) used the mucocutaneous junction of the lip as a free graft, removing the skin and mucous membrane in one piece and then folding it to provide both skin and smooth lining. This article is reported in Russian and, unfortunately, at the time (1933), the paper used and the few diagrams shown were not of good enough quality for one to form an opinion as to the result obtained. Eight of the nine cases were successful according to a German abstract.

---

Fig. 57.—Case 2. Final condition six months later (unchanged ten years later) looking straight ahead (W. L. H.).

Fig. 58.—Case 2. Final condition looking down (W. L. H.).

Fig. 59.—Case 2. Final condition with eyes closed (W. L. H.).

Fig. 60.—Case 2. Final condition looking up (W. L. H.).

3. The subcutaneous scar tissue in the graft bed was removed to give a proper base for nutrition; in addition, bleeding was completely controlled and all blood clots and exudate were removed from the graft bed.

4. At least two substantial lid adhesions were made to keep the lids in good position until the union and organization of the deeper tissues were complete.

**Materials in Contact With the Graft.**—The materials used directly over the graft have varied from time to time. Some thin flexible material which will not become adherent to the underlying tissues is necessary to prevent adhesion to the gauze which was usually applied over the area for immobilization purposes. Clay was used for this purpose in rhinoplasty in India. Goldbeaters' skin was in common use in the nineteenth century by de Wecker<sup>312</sup> (1879) and others. Charpie was used especially in France by Jobert.<sup>318</sup> Adhesive plaster was used by Blasius<sup>101</sup> (1842), Driver<sup>319</sup> (1870) and Thomason<sup>320</sup> (1915). Sheet rubber was employed by Heckel<sup>321</sup> (1910). Gutta percha, rubber tissue, and sterofil porgee were used by Wheeler<sup>322</sup> (my personal observations). Paraffin was listed by Bardelli<sup>323</sup> and Blair<sup>324</sup> (1932). Tin foil was used by Bourgeois.<sup>25</sup> Cellophane (personal) and Kodapak were found to be insufficiently flexible. Perforated Cilkloid becomes quite flexible when sterilized in 90 per cent alcohol and has the advantage, along with cellophane, of being transparent and revealing the actual position and condition of the graft and lashes after it has been applied. If a double layer is used, the graft does not adhere to the dressing through the perforations.

**Pressure.**—The question of holding the graft in place quite firmly with a pressure dressing was not emphasized by many of the earlier operators but, when grafting without a pedicle came into vogue, surgeons began to realize that prolonged immobilization of the parts was important for the success of the graft. Another important point is that the pressure should be sufficient to counteract the tendency toward swelling with collection of serum and blood in the space between the graft and its bed. The histological studies of Thiersch<sup>177</sup> clearly showed that there is canalization of the collection of cells between the two layers with true blood vessel formation later. If this layer



cous membrane from the mouth for free grafts for the eyeball or to form the lining of a lid (Stellwag von Carion<sup>356</sup> in 1873, Bock<sup>361</sup> in 1884, and Dransart<sup>4362</sup> in 1895). Gillies<sup>366</sup> in 1935 and Spaeth<sup>367, 368</sup> in 1937 also made use of mucous membrane for the lid lining. The present author has used this tissue with excellent results (see Cases 6 and 9) in several cases of severe symblepharon. W. R. Parker<sup>369, 370</sup> in 1926 and Vilray P. Blair<sup>371</sup> (also J. F. S. Esser<sup>255</sup> in a personal conversation) were not in favor of its routine use for lining the lid, preferring thin split skin grafts.

**Buccal Mucous Membrane.**—Rollet<sup>363</sup> in 1906, in his method of lid reconstruction “à tiroir,” used a sliding graft of cheek skin from below and applied mucosa from the mouth to the inner surface. Attilio Magaldi<sup>364</sup> in 1903 reported a case operated upon by De Berardinis<sup>365</sup> in which a piece of buccal mucous membrane from the inner surface of the lip was applied at the time of the operation to the inner portion of a pedicle graft from the cheek used for the lid.

### Pregrafting of Mucous Membrane

**Pregrafting Onto a Free Graft.**—Mucous membrane has also been used in conjunction with free grafts. In 1908 Paul Knapp<sup>374</sup> suggested pregrafting a piece into the skin of the ear next to the cartilage so that when the cartilage was taken at a later date for reconstruction of the lid, it would have a mucous membrane lining to place next to the eyeball. He said that he would try it at the first opportunity. In 1935 Gillies,<sup>375</sup> in reconstructing a lower lid, used a free graft of mucous membrane when transferring a previously inlaid piece of ear cartilage by means of a pedicle graft from the upper lid. When there is insufficient conjunctiva to line the new lid in the de Argumosa-Dieffenbach procedure, mucous membrane from the mouth has been used (Meller<sup>376</sup>).

Minor portions of skin to be used for a free graft may be lined with mucous membrane and later transferred for use in the lid. The report of a case follows in which a free graft of upper lid skin was pregrafted with buccal mucous membrane and then used to reconstruct a new lower lid.

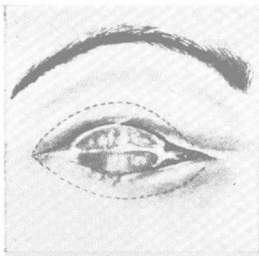


FIG.147

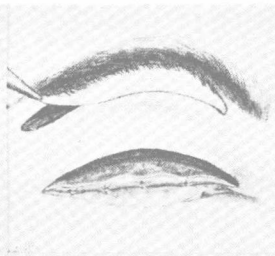


FIG.148

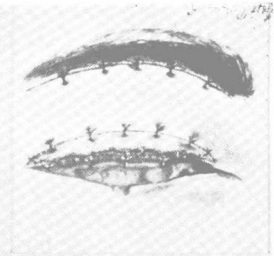


FIG.149

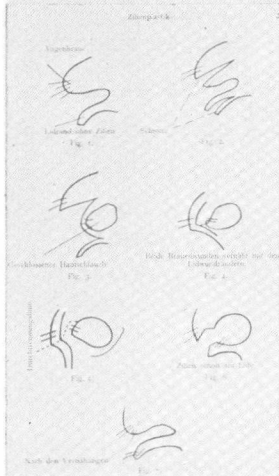


FIG.150



FIG.151



FIG.152

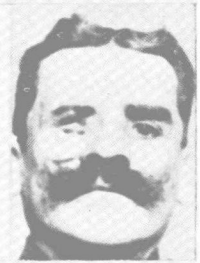


FIG.153

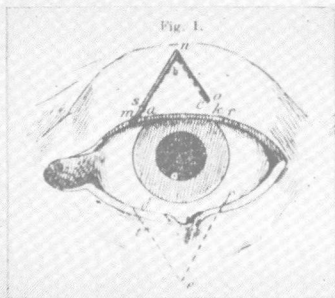


FIG.154

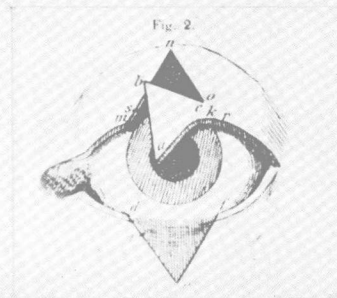


FIG.155

Fig. 147.—Deformity of lids with absence of lash borders (Wheeler).

Fig. 148.—Transplantation of hair-bearing strip of skin from brow to lid using same technique as used by Paul Knapp in 1908 (Wheeler).

Fig. 149.—Graft sewn in position (Wheeler).

Fig. 150.—Cilia transplantation for upper lid by turning outer layer of split edge of lid into incision in eyebrow (J. F. S. Esser).

Figs. 151, 152, and 153.—Case operated upon by this method (J. F. S. Esser).

Fig. 154.—Biological flap from upper lid to replace portion of lower lid margin (J. F. S. Esser).

Fig. 155.—Same showing flap being turned to insert it into lower lid (J. F. S. Esser).

Three months later a lash transplant was performed to provide lashes for this portion of the lower lid, and the lid fissure was opened after another three months.

Similar stages were carried out for the reconstruction of the temporal portion of the left lower lid.

In this case it was necessary to reconstruct only the temporal portion of each lower lid, and only the temporal one-half and one-third, respectively, of the upper tarsi were used.

### **Carcinoma of Meibomian Glands of Lower Lid**

CASE 20.—

*Patient:* Mrs. F. W., aged 59 years.

*Diagnosis:* Carcinoma of the meibomian glands of the right lower lid.

*History:* When first seen, the patient had a large pedunculated mass growing from the right lower lid (Fig. 193). This growth had been present for about one year and recently had been increasing in size. The vision of each eye was normal with correcting lenses. General physical examination and local examination were normal except for the right lower lid. A mass measuring three and one-half centimeters by three and one-half centimeters by three centimeters was attached to the lid margin by a pedicle about one and one-half centimeters in diameter. The remainder of the lid margin was slightly infiltrated.

*Treatment:* The growth, including the entire lower lid, was removed, and the reconstruction of the right lower lid was done in three stages. There was a slight trichiasis of the temporal end of the upper lid for which an electrolysis of about eight lashes in this region was performed five months later.

The trichiasis was due to two things: first, the separation of the tarsus from the superficial layer of the lid at the temporal end was not carried high enough, causing the levator to pull too much on the inner layer of the upper lid; and, second, the incision between the two rows of lashes for the interpalpebral fissure was made slightly too high, not leaving sufficient tarsus at the border of the upper lid. The first is the usual cause of an entropion or trichiasis of the upper lid after the completion of the third stage. The final incision should hug the lower row of lashes.

provides a smooth lining to allow the new lid to fit snugly and to move freely and without irritation over the exposed surface of the eye. Its margins are attached to the conjunctival edge above and below in the same manner as when the tarsus (with its closely adherent conjunctival layer) is used.

b. *The external layer:* To protect the inner layer of the upper lid and to allow it to function properly, the outer layer must be well planned. The most important consideration for this outer layer is the provision of a thin, flexible, cutaneous covering of sufficient dimensions to provide a fold and to allow the lid to come down to meet the lower lid and thus completely protect the cornea even during sleep. The cutaneous layer should match the lid skin of the opposite upper lid in dimensions, flexibility, texture, color, and thinness as well as in its architecture.

The lashes on the margin of the upper lid are functionally and cosmetically important and can usually be quite well provided by utilizing a properly chosen strip of hair-bearing skin from the nasal end of the brow on the same side, as previously described (see Figs. 162-164).

If the nasal and/or temporal canthal angle is undamaged or can be preserved (as in Case 22, Fig. 224), its integrity should be carefully guarded, since the presence of normal angles is an important factor for proper function and appearance. Once either canthus is destroyed, it is difficult to duplicate exactly.

One may readily see from what has been pointed out that the reconstruction of a good upper lid is a difficult surgical problem. An ideal upper lid should exactly match the normal, but, practically, one must usually be content with somewhat less than a theoretically perfect result.

The new upper lid must provide as a minimum: (1) protection from exposure from the bulbar conjunctiva and cornea; (2) size, sufficient to allow for closure adequate to protect the cornea during sleep; (3) motility sufficient to spread the conjunctival fluid over the eye by winking, with elevation sufficient to uncover at least part of the pupillary area; (4) externally, at least a fairly acceptable cosmetic match for the opposite upper lid with respect to color, texture, flexibility, dimensions including thickness (or rather thinness), vertical length, and arching, and the presence of a fold.

per and for the lower lid can be transplanted at the same sitting by leaving a one millimeter strip of skin between the two transplanted cilia grafts.

Fourth Stage: After the lashes are seen to be growing properly, an incision is made to open the interpalpebral fissure between the two rows of lashes (Fig. 258). The fissure is made slightly longer than that of the opposite side and a few sutures are placed at the temporal canthus only, to close the raw surface at the canthal angle and prevent the two freshly cut lid margins from growing together here. Unless this is done, there is a tendency for the interpalpebral fissure to become shorter than desired and for the canthal angle to become rounded. Usually no sutures are necessary except at the lateral canthus.

When the blepharorrhaphy is divided over a considerable length of lid, it is better not to put sutures along the rest of the margin to unite the skin and conjunctival margins, but to allow the margins to adhere and to break up the adhesions by pulling them apart daily. The raw surfaces on the margins usually adhere for the first two or three days under the dressing, but the adhesion can be easily broken up by manually pulling the lids apart. By the second or third day the lids no longer adhere to each other and the margin of the upper lid usually fits the lower quite well. Also this method usually results in a well-shaped lid margin with less tendency to entropion or trichiasis than if an attempt is made to close the raw surface of each lid margin with sutures.

Hot compresses followed by some mild cleansing drops and ointment are used three times daily until final healing has taken place. If there are minor irregularities in the newly formed edge of the lids, they will frequently smooth out in time; however, larger irregularities may have to be trimmed or thickened areas may have to be thinned down to obtain the best final result.

168. Le Fort: Blépharoplastie par un lambeau complètement détaché du bras et reporté à la face. Insuccès. Bull. Soc. de chir., 3. s., 1: 39-41, 1871. Disc., 41-44. (Patient seen on November 17, 1869, but operation for ectropion not done until February 15, 1870. P. 41, Panas claims priority for Laugier. Pp. 42, 43, Le Fort credits Laugier with priority.)
169. Le Fort: Oeuvres. Paris, F. Alcan, 1895-1897. (V. 3, 1897, pp. 556, 557, retracts admission of Laugier's priority.)
170. Valude, E.: De la restauration des paupières (désavantages de la greffe cutanée). Arch. d'opht. 9: 289-311; 394-409, 1889. (Report of two personal cases and review of seventy-five from the literature. P. 395, results "worse than mediocre.")
171. Czermak, W.: Die augenärztlichen Operationen. Vienna, Karl Gerolds Sohn, 1893-1904. (Pp. 213-215, advises against free grafts.)
172. Wadsworth, O. F.: A Case of Ectropion Treated by Transplantation of a Large Flap Without Pedicle. Boston M. & S. J. 95: 747-750, 1876. (Operation done on July 30, 1876.)
173. Noyes, H. D.: Formation of an Eyelid by Transfer of Large Piece of Skin Without Pedicle. M. Rec. 17: 344-346, 1880. Abstract in: New York M. J. 31: 628, 629, 1880. Disc., 629, 630. (Reeve and Abbott quoted.)
174. Weeks, J. E.: A Case of Restoration of the Integument of the Upper Lid by Transplanting a Flap Without a Pedicle. Arch. Ophth. 18: 92-95, 1889. German translation in: Arch. f. Augenh. 22: 257-260, 1891. (Patient seen in July, 1885.)
175. Ollier: Des greffes cutanées. Compt. rend. Acad. d. sc. 74: 817-819, 1872.
176. Poncet, A.: Des greffes dermo-épidermiques et en particulier des larges lambeaux dermo-épidermiques. Lyon méd. 8: 494-501; 564-571. Disc., 520-525. (Pp. 497 and 500, Ollier.)
177. Thiersch: Ueber die feineren anatomischen Veränderungen bei Aufheilung von Haut auf Granulationen. Arch. f. klin. Chir. 17: 318-324, 1874.
178. Ollier: Des greffes cutanées. Compt. rend. Acad. d. sc. 74: 817-819, 1872. (P. 818, Hamilton.)
179. Hamilton, F. H.: Elkoplasty, (ελκος Ulcer and πλασσω); or, Old Ulcers Treated by Anaplasty. New York J. Med., n. s., 13: 165-173, 1854. (Operation done on January 21, 1854.)
180. Ollier: Des greffes cutanées. Compt. rend. Acad. d. sc. 74: 817-819, 1872. (P. 819, source of grafts.)
181. Filatov, V. P.: Sur la transplantation optique de la cornée et sur la transplantation thérapeutique des tissus. Acta med. URSS 1: 412-439, 1938. (Pp. 432 and 436.)
182. Poncet, A.: Des greffes dermo-épidermiques et en particulier des larges lambeaux dermo-épidermiques. Lyon méd. 8: 494-501; 564-571, 1871. Disc., 520-525. (Pp. 495-496, Tripier.)
183. Eversbusch, O.: Ueber die Verwendung von Epidermistransplantationen bei den plastischen Operationen an den Lidern und an der Conjunctiva. München. med. Wehnschr. 34: 1-3, 19-22, 1887.
184. Foster, F. P.: An Illustrated Encyclopaedic Medical Dictionary. New York, D. Appleton, 1890. (V. 2, p. 1359, definition of Lister dressing.)
185. Poncet, A.: Des greffes dermo-épidermiques et en particulier des larges lambeaux dermo-épidermiques. Lyon méd. 8: 494-501; 564-571, 1871. Disc., 520-525. (P. 521, Létiévant mentions his use of the skin of a dog for grafts.)