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Blepharoplasty: Personal Experience with 4,564 Consecutive Cases

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History

The operation that we now term blepharoplasty was known to Arabic surgeons of the 10th and 11th centuries A.D. who described techniques to obtain relief from full, overhanging upper eyelids and puffiness and wrinkling of the lower eyelids.[18] In 1893, Dupuytren reported his technique of exising skin to correct baggy eyelids. It was subsequently discovered that this was insufficient treatment, and he later described the appearance of small and cystic tumors ("hail stones") which herniated through the fascial orbital septum. Following his work, it became apparent that excision of these fatty cysts was necessary to obtain a good result.[1]

In 1844, Sichel distinguished between paralytic ptosis, anatomic ptosis, and fatty ptosis and described the appearance of fatty pads herniating through the orbital septum. In this century, renewed attention was paid to cosmetic rather than functional problems, and blepharoplasty gained the attention of plastic surgeons.[13,14] In 1907, Miller[18] suggested extending the incision into the outer canthal area. A transconjunctival approach was suggested by Bourguet in 1928, but the most popular approach was that described by Madam Noel in the same year: an incision in the lower eyelid 2 mm below the lashes.[13] In 1931, Joseph published his drawings for external incisions on the upper and lower eyelids and, despite minor modifications, his original designs remain valid to this day.[27]

Anatomic-Pathologic Considerations

On the basis of Spalteholtz's classic topographic anatomy of the region,[58] we describe some maneuvers we consider useful in performing blepharoplasty. The eyelid changes are not necessarily restricted to older patients, although they are more common in people past middle age because of the natural senescence of the tissues. Familial predisposition has frequently been noted, especially in patients around 30 years of age with blepharochalasis of the upper lid and pockets in the lower lid.[49,54] Congenital weakness of the orbital septum was described by Dupuytren as early as 1839.

A large majority of Dr. Pitanguy's patients (more than 80% of whom are women) requested surgery for aesthetic and psychological reasons (Tables 1 and 2). Some presented with symptoms that interfered with normal palpebral function.[56]

TABLE 1
Age Group

Age (Yrs.)	No. of Patients	Percentage of Total
20–29	64	1.4%
30–39	708	15.5%
40–49	1871	41.0%
50–59	1433	31.4%
60–69	452	9.9%
70–79	36	0.8%
Total: 4,564		

TABLE 2
Sex

Female	84.6%
Male	15.4%

Excess skin of the upper eyelids, because of its weight, may sag and obstruct the visual field, causing compensatory dilatation of the pupil. It may also interfere with lacrimal canaliculus function, hindering drainage.

The clinically important deformities of the upper eyelids may be classified as follows[2,5,6]: 1) blepharochalasis, 2) adipose ptosis, and 3) herniation of the orbital fat.

Blepharochalasis is characterized by thinning of the skin of the upper eyelids, which results in the formation of multiple folds and simulates palpebral ptosis. In some cases, it is a sequel to angioneurotic edema; recurrent localized edema leads to emaciation of the tissues and loss of elasticity.

Adipose ptosis results in less accentuated pleating, but equally severe pseudoptosis occurs owing to weakening of the fibers of the fascia that secure the skin of the eyelid to the musculature and to the palpebral borders.

Orbital fat herniae of the upper and lower lids are caused by weakening of the orbital septum and protrusion of the orbital fat situated behind it. The orbital septum is a fascial structure that lies along the back of the orbital rim. It blends with the levator aponeurosis a few millimeters above the upper border of the tarsus in the upper lid and is attached to the lower border of the tarsus in the lower lid. The fat lobes may eventually herniate beyond this fascial barrier and the orbital muscle, and the excess orbital fat fills out the slack skin of the eyelids so as to form bulges, or palpebral pouches.[10]

Three deformities of the lower eyelid[3] are commonly seen: 1) simple flaccidity of the inferior palpe-

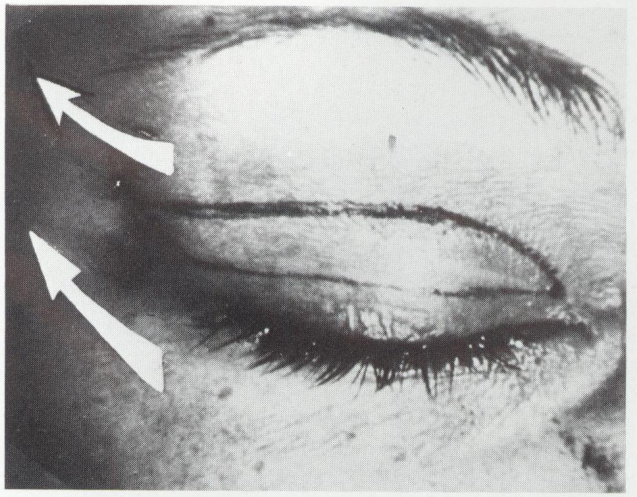


FIGURE 1. In marking the inferior eyelid, the external compensation should follow the natural direction of the corner of the eyefold, the same direction as the "round lifting" skin traction.

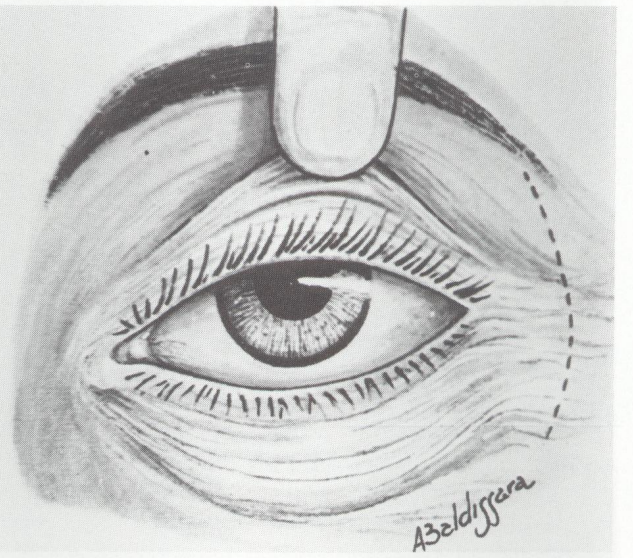


FIGURE 2. The enlargement of the original incision, when compensation becomes necessary for removal of additional palpebral tissue, should follow the direction of the local pleats and must not extend beyond the projection line of the external orbital margin.

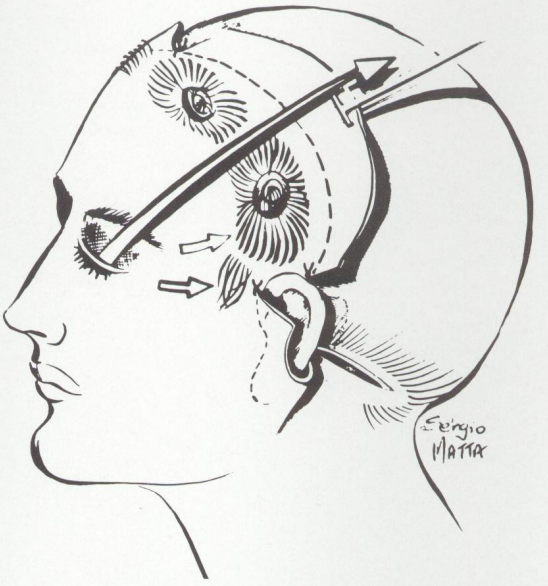


FIGURE 3. The small arrows show the temporal-orbital direction of the lifting, which is sometimes complemented by a frontal traction (longer arrow). Better positioning of the eyebrows is achieved, and distribution of the infrasuperciliary skin excess is better than with a simple blepharoplasty.

FIGURE 4. Vertex markings of the skin portion to be excised is done with methylene blue; the eye should be in a normal open position.

bral skin; 2) hypertrophy of the marginal layers of the ciliary fibers of the orbicularis muscle, with resultant pleating of the overlying skin; and 3) herniation of the inferior fat pads. These conditions may be present alone or in combination.

Surgical Considerations

Dr. Pitanguy's experience with these patients has suggested the importance of the following[39,42]: 1) consideration for different anatomical features and careful assessment of local "anatomic unity"; 2) "normal" scar contracture; 3) atraumatic surgical maneuvers; and 4) meticulous hemostasis.

Although blepharoplasty can be done separately, it is usually associated with other surgical procedures, especially with rhytidoplasty in a case of facial flaccidity (Table 3).[7] Blepharoplasty associated with rhytidoplasty[4,23,24,26,36–38,40] should be performed after traction of the face, in the same direction, forming a "round lifting."[31,43–48,50] The facial traction determines any alteration in the direction of palpebral wrinkles and corrects those more laterally placed[44,45,47,48] (Fig. 1). The incision must follow the direction of the markings of the newly formed wrinkles so the final incision will lie in a harmonious line[38,48]

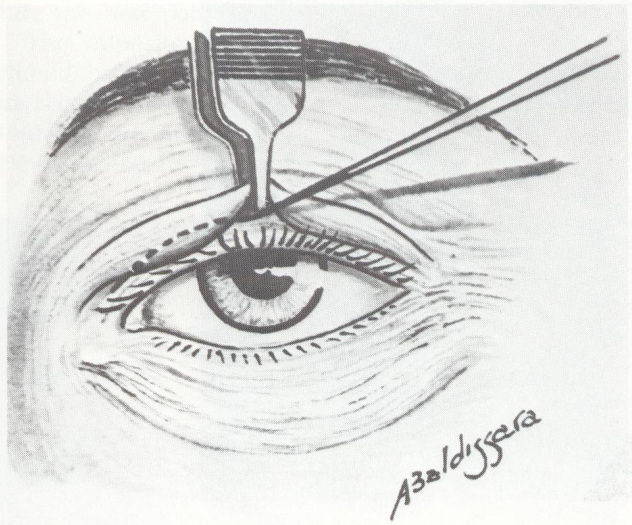


FIGURE 5. The pinched, flaccid portion of the ptosed eyelid shows the superior palpebral sulcus; inferior demarcation of the portion to be removed should be placed here.

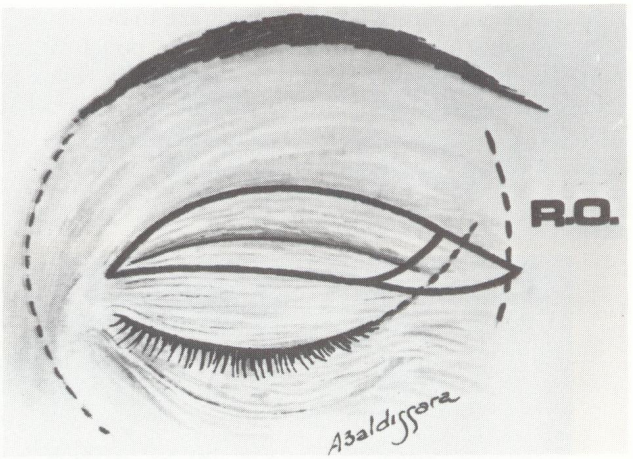


FIGURE 6. The excised skin fusion must not exceed the projection line of the external orbital margin. Its external vertex will coincide approximately on the arch that continues the inferior lid line.

(Fig. 2). When the palpebral pseudoptosis is more conspicuous on the external palpebral canthus, an associated frontal rhytidoplasty improves the blepharoplasty as it places the eyebrows in a better position[38,42,48] (Fig. 3).

Surgical Technique

The operation can be performed under local or general anesthesia. When the operation is restricted to removal of excess skin, local anesthesia with appropriate sedation is preferred. This allows patients to open and close their eyes on command, thus facilitating demarcation of the lines of incision. In more ex-

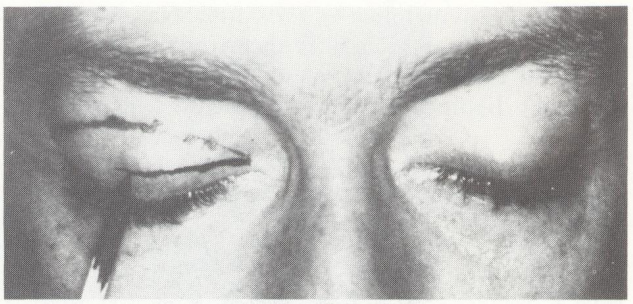


FIGURE 7. The inferior portion of the skin to be removed should reproduce the superior palpebral sulcus before it became flaccid.

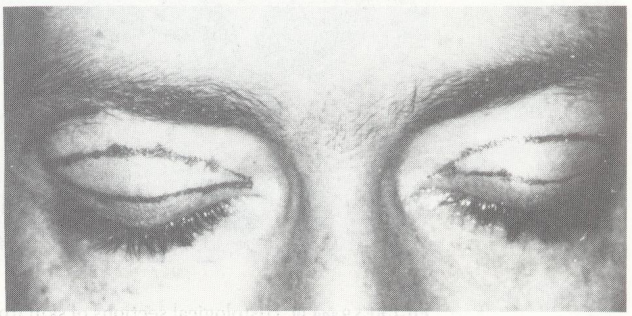
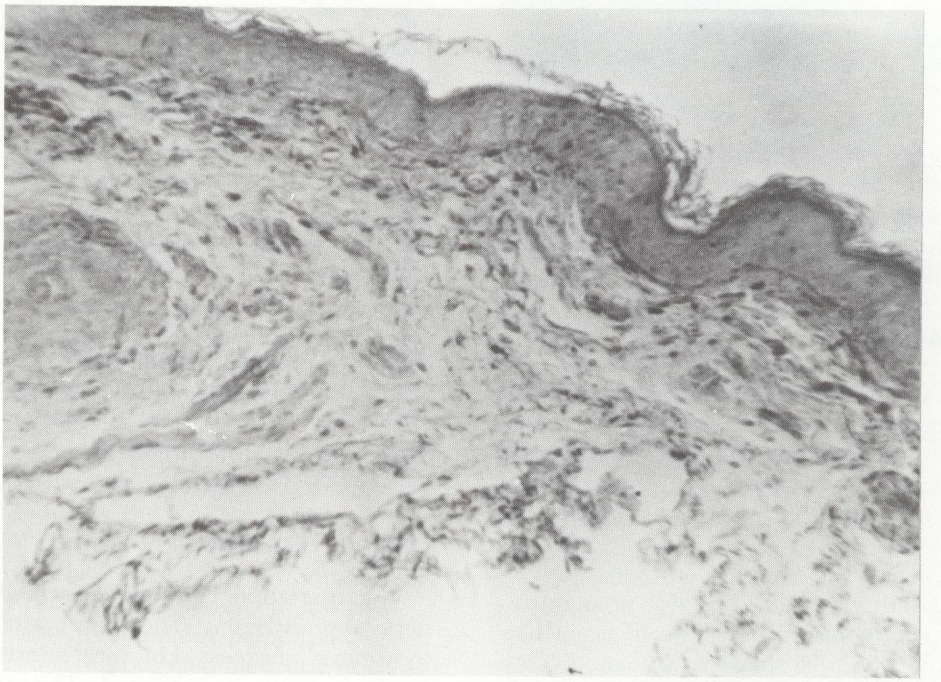
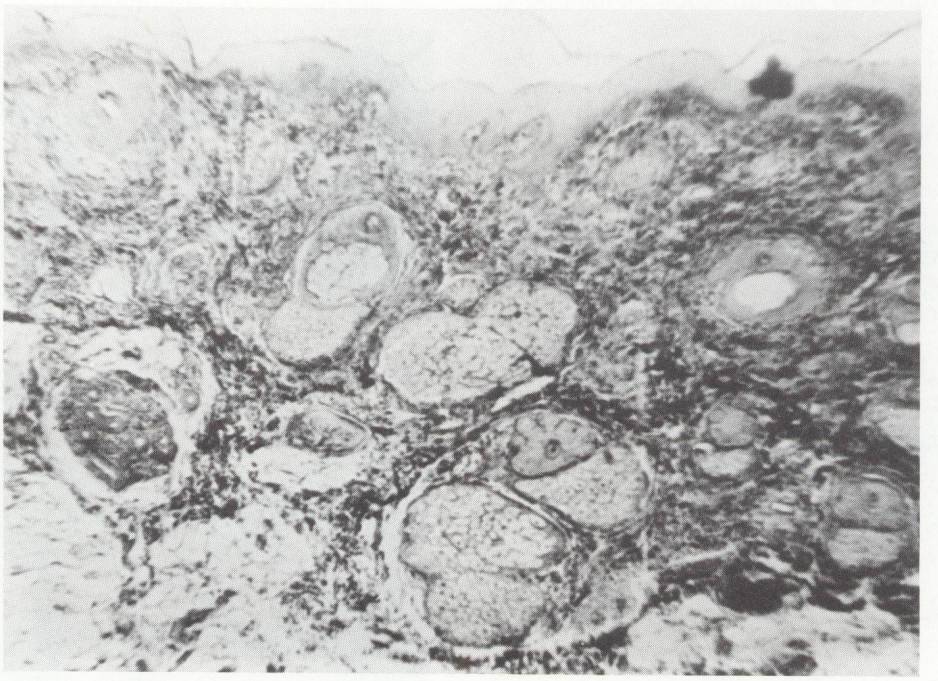


FIGURE 8. The incisions should never go beyond the projection line from the external orbital margin (dotted line).

tensive procedures, when fatty pads are to be excised, general anesthesia is preferred. Fatty pouches are more easily manipulated, and the lack of any reflex or voluntary movements allows a careful and controlled excision of adipose tissue. Danger of injury to the inferior oblique muscle is also diminished.[48,51]

Since the lids cannot be closed, it is essential that great care be taken to prevent desiccation, irrigation, or trauma to the cornea. Precautions include regular instillation of a few drops of saline into the conjunctival sac and avoidance of contact between the cornea and swabs and instruments.[21,39,61]





FIGURES 9 and 10. Histological sections of skin from an adequate blepharoplasty and from the temporal region have been stained to show elastic fibers. Greater thickness of temporal skin due to a great conjunctive fibrous contingent can be seen. Elastic fibers are stained dark brown.

TABLE 3
Most Frequent Surgical Procedures

Surgical Procedure[a]	No. of Patients	Percentage of Patients
Rhytidoplasty	4,152	90.0%
Frontal rhytidoplasty	689	15.1%
Rhinoplasty	420	9.2%
Mammoplasty	228	5.0%
Mentoplasty	160	3.5%
Facial mechanical dermabrasion	132	2.9%
Abdominoplasty	123	2.7%
Palpebral ptosis	14	0.3%
Prominent ears	9	0.2%
Total patients:	4,564	

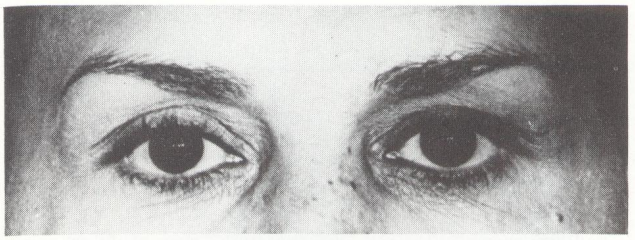
[a] Two surgical procedures were combined in some patients.

Upper Eyelid

The upper eyelid is elevated so that the ciliary border lies at the level of the midpupillary line, simulating the natural position of the eye and giving a rough idea of how much slack tissue is present. The eyelid is then released and the slack tissue is grasped with a forceps to form a pleat and establish the size and position of the proposed resection (Fig. 4). The upper incision line can then be drawn, and it will follow the curved shape of the patient's eye. The skin is stretched over the tarsus to the line that corresponds to the former upper palpebral groove (Fig. 5). The lower incision line lies in the palpebral fold and curves upward at the lateral end, following the natural curve of the superior palpebral margin. This lateral extension remains within the orbital perimeter (Fig. 6). The inferior incision determines the shape and position of the final scar, and if the spindle-shaped area of skin has been correctly marked, the skin formed by the union of its upper and lower margins after resection of the intervening skin will come to lie at the site of the original palpebral fold and will constitute the new palpebral fold.

The opposite eyelid is similarly marked and it should be noted that the skin margins may not be identical. The face may be asymmetrical and the contours of the upper eyelids may differ. The lateral extent of the fusiform excision should never lie outside the orbital perimeter, since the periorbital skin has a greater concentration of connective tissue fibers (Figs. 6–10). The resulting scar is hardly noticeable in the palpebral skin, but is much thicker and produces serious disfigurement if extended into the periorbital skin[28] (Figs. 11–13).

FIGURE 11. The markings outside the external orbital margin disregard the delimitations of the palpebral-orbital "anatomic unity."



FIGURES 12 and 13. When the incision reaches the projection area of the external orbital margin on the immediate infrasuperciliary region, the abundant conjunctive constitution of skin will cause barely disguised unaesthetic scars outside the palpebral "anatomic unity."

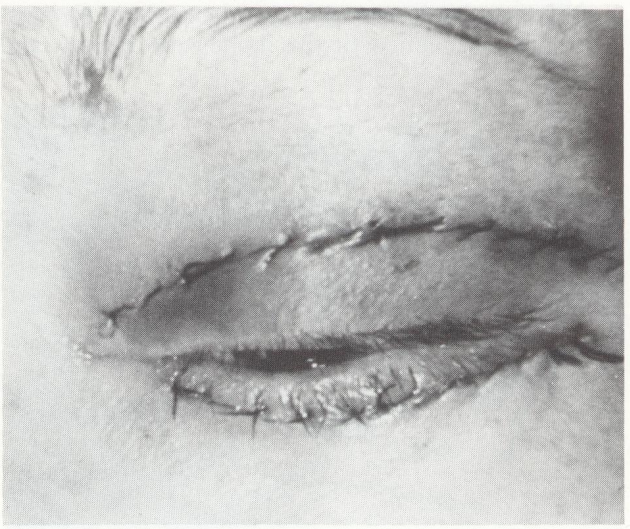


FIGURE 14. The sutured eyelid reproduces the upper palpebral sulcus on its natural anatomic site.

TABLE 4
Pouch Procedures

Procedure	No. of Patients	Percentage of Patients
Upper lid	1,369	30.0%
Lower lid	2,008	44.0%
Without fat pad resection	1,734	38.0%

TABLE 5
Skin Procedures

Procedure	No. of Patients	Percentage of Patients
Upper lid	593	13.0%
Lower lid	361	7.9%
Upper and lower lid	3,482	76.3%
Without skin	128	2.8%

If the operation is performed with general anesthesia, the spindle-shaped area of skin is infiltrated subcutaneously with a solution of lidocaine (0.25) and epinephrine (1:200,000). If the anesthesia is only local, the concentration of lidocaine is raised to 0.5%. This infiltration facilitates the procedure by tautening and smoothing out the skin to be incised.

With a single stroke of a no. 15 blade, a superficial incision is made along the superior line and completed along the inferior line. The skin is undermined with neat strokes of the knife. The undermining is kept superficial so as to avoid damage to the underlying orbicular and levator aponeurosis. The spindle-shaped area of skin is then resected and hemostasis is carefully secured by electrocautery.

If any superior orbital fat pouches are present, the orbicular muscle is split at its nasal corner by an incision with the point of the knife along the direction of its fibers. The incision is continued through the orbital fascia to expose the intraorbital fat. The excess is then dissected free with tiny hemostatic forceps. The fat is clamped with the hemostatic forceps and cut. Hemostasis is completed by slowly releasing the forceps and cauterizing any bleeding vessels. A fine continuous suture of 6.0 atraumatic braided silk finishes the operation. Moist compresses are applied to the eye and the same procedure is performed on the opposite side (Fig. 14) (Tables 4 and 5).

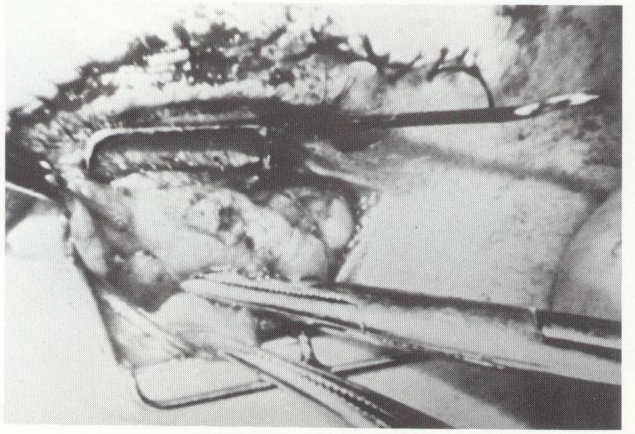


FIGURE 15. The inferior oblique muscle is found between the internal inferior and the medial palpebral "pouches" dividing them.

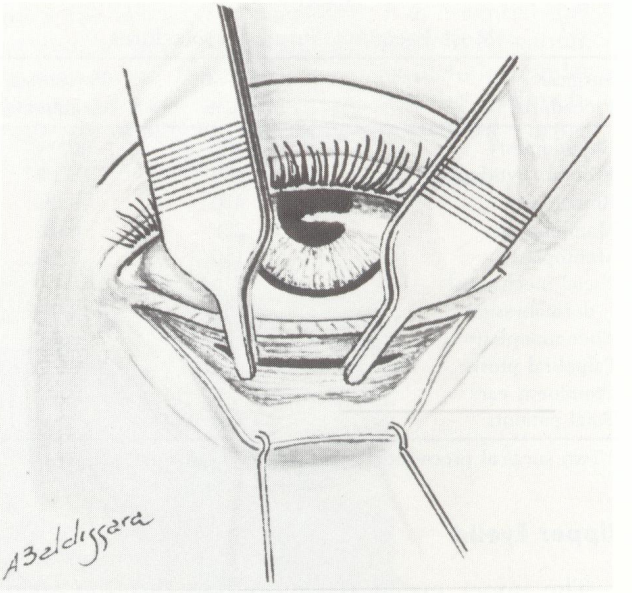


FIGURE 16. After inferior hernia excision, an adequate approximation of the orbicularis muscle margin will avoid adhesions to the tarso-orbicularis fascia and excessive neoformed fibrous tissue that could lead to ectropion.

Lower Eyelid

The incision on the lower eyelid runs 1–2 mm from and parallel to the ciliary border and extends from the punctum lacrimale to the lateral canthus, where it follows the natural skin creases known as "crow's feet." Subcutaneous infiltration is carried out with local anesthesia containing epinephrine.

When there is a large amount of excess skin (e.g., those cases in which the skin is hypertrophic, forming a bulge running along the lower eyelid), a spindle-shaped area of skin of approximately 1–2 cm in width

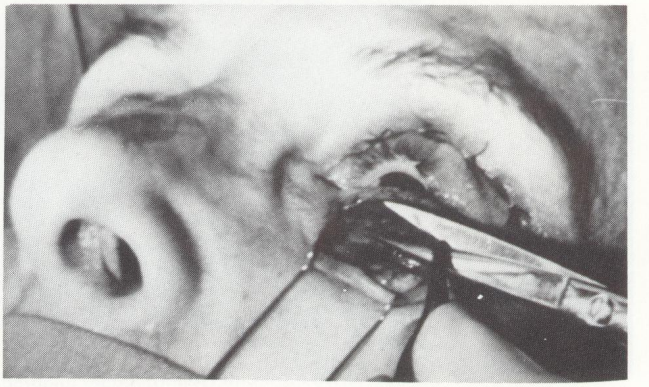


FIGURE 17. Resection of a hypertrophied muscular bundle (ciliary) can follow the skin resection of the lower eyelid.

(a)

(c)

(b)

(d)

FIGURE 18

(*e*)

(*f*)

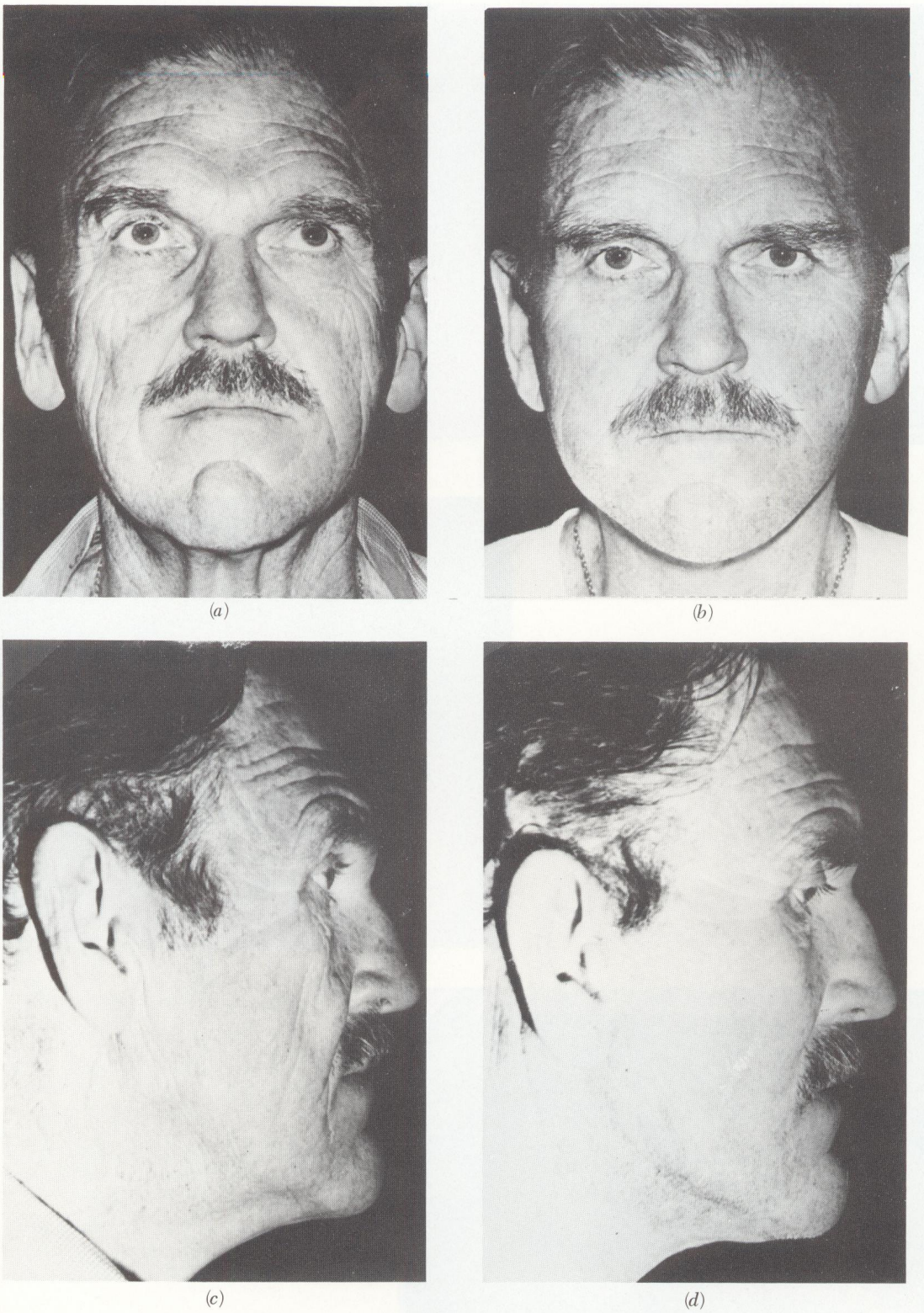
FIGURES 18*a*–18*f*. A 46-year-old patient with fat pouches and palpebral and facial flaccidity underwent forehead lift, face and neck lift, and blepharoplasty (shown 6 months after operation).

may be incised prior to undermining. This spindle-shaped area is excised with scissors and may include some inferior ciliary fibers of the orbicularis muscle if the latter is also hypertrophied. In usual cases the subciliary incision is made, and the flaccid skin of the lower eyelid is undermined subcutaneously by sharp dissection to expose the underlying orbicular muscle. If fat pouches are present, requiring surgical correction, the skin flap is everted with a double hook, hemostasis is secured, and the orbicularis muscle is split by a long incision following in the direction of its fibers. The orbital septum is incised and the three fat pouches—medial, middle, and lateral—are caused to protrude by gentle pressure on the eyeball. (Fig. 15). A self-retaining retractor facilitates exposure and the fatty pouches are further mobilized by blunt dissection with scissors. Care should be taken to avoid excessive amounts of intraorbital fat since this will result in an expressionless, anophthalmic appearance.

After careful hemostasis the muscle is repositioned (Fig. 16). The excess skin is then marked with methylene blue and excised with fine scissors (Fig. 17). The skin that remains should suffice to cover the eyelid loosely; even slightly excessive skin resection may lead to ectropion. The wound edges are approximated with two or three interrupted sutures of 6.0 braided silk and the wound is closed with a continuous suture of the same material. Finally, a cotton gauze pad moistened in ice is placed over each eye.

Complications

Many possible complications of blepharoplasty such as blindness, conjunctivitis, corneal ulceration, and palpebral ptosis can be avoided by correct preoperative assessment, strict adherence to proper surgical technique, and meticulous postoperative care.[12,17,35,53] Despite careful assessment and surgery, however, certain complications do occur (such as hematomas, ecchymosis, temporary paresis, inclusion cysts, ex-



(a) (b) (c) (d)

FIGURES 19a–19d. A 60-year-old patient showed marked facial cervical ridges and palpebral flaccidity. The adequate use of incisions emphasizing the superior incision line corrects the deformity with no ill-placed scars.

cessive excision of skin leading to ectropion, and excessive removal of intraorbital fat)[8,11,16] (Table 6).

In blepharoplasties with inferior fat pad resection, a certain degree of hematoma, or in thick-skinned patients, a moderate ectropion, is observed in some cases after the first week; these conditions abate on the third or fourth postoperative week. In these cases we use daily massages, maintaining the eyelid in a correct position and protecting the cornea, until there is complete remission of the process.

(*a*)

(*b*)

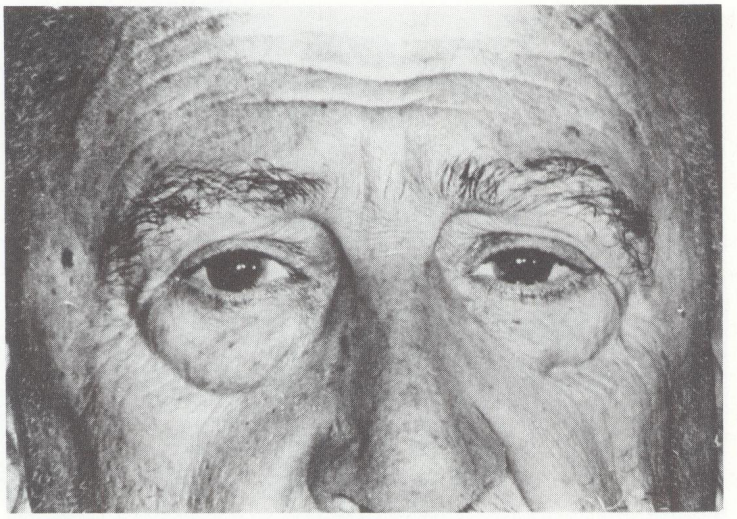
(*c*)

(*d*)

(*e*)

(*f*)

FIGURES 20*a*–20*f*. A 60-year-old patient with excess skin fat pouches and marked crow's feet underwent blepharoplasty and rhytidoplasty. When blepharoplasty is associated to a frontal rhytidoplasty, it will place the eyebrow so that it becomes an important supporting agent in the correction of a palpebral ptosis, which in these cases is more marked at the external corner and would not be sufficiently corrected by a simple facial rhytidoplasty.



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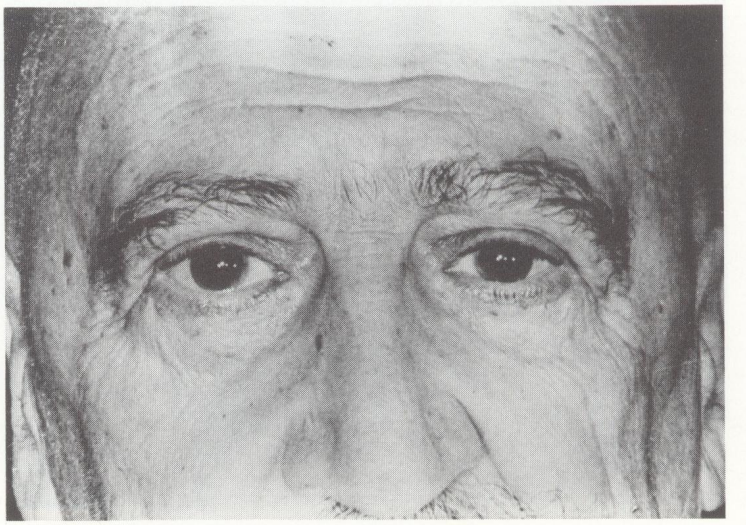


(*b*)

Of 4,564 consecutive blepharoplasties, seven cases of temporary ectropion consequent to muscular entrapment were recorded, with posterior remission. Two cases of inferior palpebral ectropion were recorded, as the skin resection was superimposed on fibrosis from a previous operation elsewhere. An exaggerated amount of skin resection of the inferior lid can be corrected by a retroauricular full-thickness skin graft or a conchal composite graft.[16,17,52]

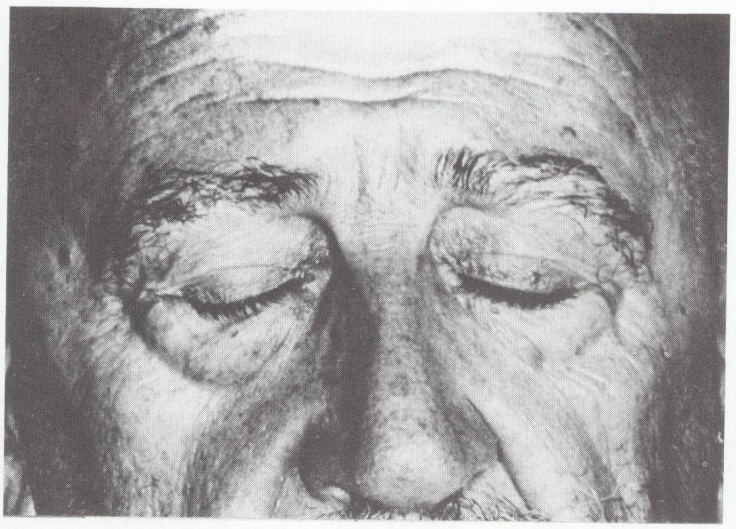
One of the most frequent complications is loss of the natural appearance in the immediate postoperative period, due to a certain degree of paresis that vanishes in the following 3–4 months.[21] Insufficient skin resection was observed in 14 patients.

A definite pigmentation consequent to local ecchymosis was observed in two patients unilaterally. Most such cases seem to result from erroneous judgment, as what really occurs is a migration of pigmented zones.

Inclusion cysts are less frequent and are easily enucleated by a needle under local anesthesia. They result from late suture removal, which allows invasion of the tunnel of the suture by the epithelial lining.

Conclusions

The surgical considerations derive from the research and observation of Dr. Pitanguy, and the procedures described constitute his basic methodology for aesthetic blepharoplasty with emphasis on the orbital-palpebral reconstitution in a harmonious and natural manner.



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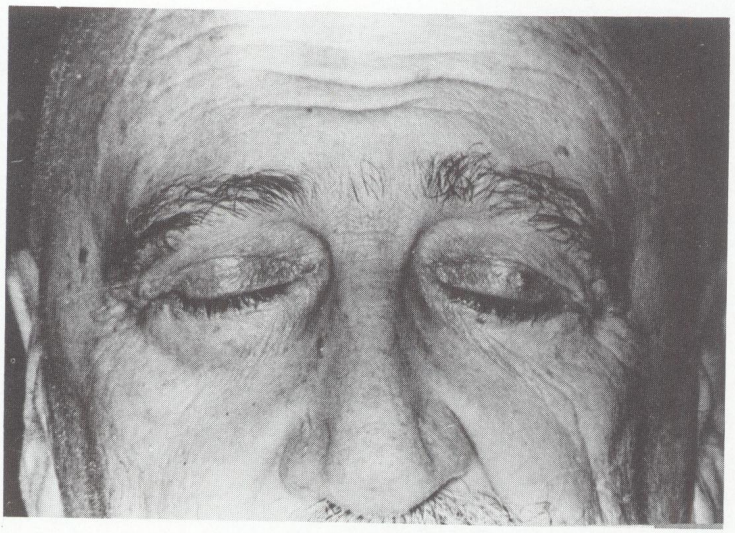

(*d*)

FIGURES 21*a*–21*d*. A 72-year-old man is shown 1 month after operation for blepharochalasis and prominent fat pouches.

Some incisions and approaches published by other authors,[9,15,19,–21,25,29,–61] in particular referring to deformities of the lacrimal gland,[61] the lateral canthus,[55,57] or of the palpebral musculature,[27,29,30,32–34] can be employed in special cases. Nevertheless, we emphasize the importance of maintaining the shape and natural appearance of the eyes, with a realistic sense of the possibilities each case offers. When incision parameters are determined by local anatomic measures, scars will not extend beyond the orbital perimeter to cause unacceptable results.

TABLE 6
Complications

Temporary palpebral ectropion	7	0.15%
Inferior palpebral ectropion	2	0.04%
Palpebral paresis	4	0.09%
Insufficient skin resection	11	0.24%
Cicatricial pigmentation	2	0.04%
Infection	0	0.0%
Inclusion cysts	8	0.17%
Retrobulbar hematoma	0	0.0%
Total	34	

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