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Full-Face Undermining Using Progressive Dilators

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Abstract. The application of a new and simple method of facial cutaneous detachment using specially designed bifaceted rigid steel wands called Dilson Luz Vascular Dilation Wands is described. These wands considerably reduce the bleeding during face-lift surgery, reducing both postoperative hematomas and the risk of facial nerve injury. This technique involves stretching the blood vessels to the point of rupture by inserting progressively larger wands. At the point of rupture, a spontaneous coagulation within the vascular extremities occurs. This is attributable to a significant blood platelet migration induced by the stimulation from the rupture of the vascular intima. The wands, varying in dimension from 1.5 to 20 mm, and are used for cutaneous facial detachment. This method has been found to result in minimal bleeding across the detached surface as well as an excellent perfusion of the overlying skin. With the use of these Dilson Luz Vascular Dilation Wands in combination with this new technique, the authors have obtained improved cutaneous detachment; reduced postoperative swelling, edema, and ecchymosis; prophylaxis of facial nerve damage; reduced procedural time; and above all, greater reduction in immediate and late postoperative hematoma formation.

Key words: Face-lifting—Facial bleeding—Facial detachment—Facial hematomas—Facial nerve injury—Rhytidectomy

The face-lift has evolved through the contributions and research of numerous colleagues, past and present, including the following advances: application of the superficial musculoaponeurotic system (SMAS)-platysma plication modifications [2,8,10,17-19,21,23,24,26,28,30,34,39]; author's considerations and research regarding the facial nerve [1,11,13,33,42]; the larger and smaller cutaneous areas that are detached [3,7,25,29,32]; association with liposuction and lipectomy [5,12,14,22,27,28] (taking out the fat by cutting out the skin); and association with laser application [4,6,37,38,41]. Despite these advances in technique, little has been achieved to avoid bleeding problems during surgery or to minimize common complications including hematomas, facial nerve damage, ecchymosis, cutaneous necrosis, and the like. Those difficulties persist, even when well-known preventive measures are used.

After reviewing their own experiences, contacting colleagues, and performing extensive bibliographic research, the authors' consensus was that the biggest obstacles to a safe, complication-free postoperative period for face-lift patients are the bleeding and the risk of facial nerve injury [9,15,16,20,31,35,36]. These complications are linked directly to the accumulated volume of blood and to the time between drainage and hematoma formation. Some accumulation is common. Complications often occur, varying from simple ecchymosis to cutaneous necrosis. These complications may be followed by neurologic damage, primarily caused by cauterization or cutting of the nerve.

The authors present this pioneer technique on facial skin flap detachment in an attempt to reduce intraoperative bleeding as much as possible and therefore minimize the aforementioned postoperative complications. This technique was consolidated from their accumulated experiences with patients during emergency procedures, in which they established that those patients who underwent partial limb amputation, by ripping or laceration, showed less bleeding. This was not the case with patients who underwent identical limb amputation caused by cutting or sharp objects. These patients often experienced severe ane-

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Fig. 1. Set of bifaceted rigid steel wands, termed Dilson Luz Vascular Dilation Wands developed by LUZ, with dimensions varying from 1.5 to 20 mm.

Fig. 2. Insertion of the wands into the three incisions to detach the cutaneous tissue. Extension, infundibulum, and rupture of the vessels by the action of the Dilson Luz Vascular Dilation Wands.

mia and always needed transfusion. The authors also note the late Master Ernesto Malbec's observations and experience. To avoid vascular cauterization, Malbec performed upper blepharoplasty with cutaneous tearing.

Materials and Methods

The authors developed this pioneer technique for the prophylaxis of hematoma and facial nerve injury in face-lift surgery. For their procedure, they designed and manufactured the prototype Dilson Luz Vascular Dilation Wands, a set of bifaceted rigid steel wands with progressive dimensions varying from 1.5 to 20 mm. These wands were used to perform complete skin flap detachment, requiring a minimum of vessel cauterization because of the improved hemostasis achieved with this procedure (Fig. 1).

This physiologic effect of improved hemostasis is explained by the sectioning of the vascular intima, which immediately causes the migration of blood platelets to the injured area, rapidly forming a blood clot. These clots are confined within the vessels, which undergo a progressive stretching, resulting in the imprisonment of coagulum in the extremities of the sectioned vessels, thereby stopping the blood flow [40] (Fig. 2).

In our study, conducted over a period of four years, 48 patients (44 women and 4 men) underwent this new technique. Their ages ranged from 43 to 73 years. They all had post face-lift follow-up assessments at 2, 3, 7, 15, and 60 days.

Before the procedure, we marked the patients while they were in a sitting position, defining the areas for the SMAS-Platysma plication. The procedure itself is performed as follows:

1. Half the face is infiltrated with lidocaine solution 0.5% plus bupivacaine 0.125%, with epinephrine at 1/200,000 variable volume from 150 to 200 ml for the whole face.
2. Two incisions of approximately 2.5 cm are made in the preauricular area, with another incision of equal length in the retroauricular area, along the markings.
3. We proceed with our technique, starting the cutaneous detachment with the 1.5 mm wand. This wand is passed through the entire previously marked facial area, which usually includes the cervical region detachment.

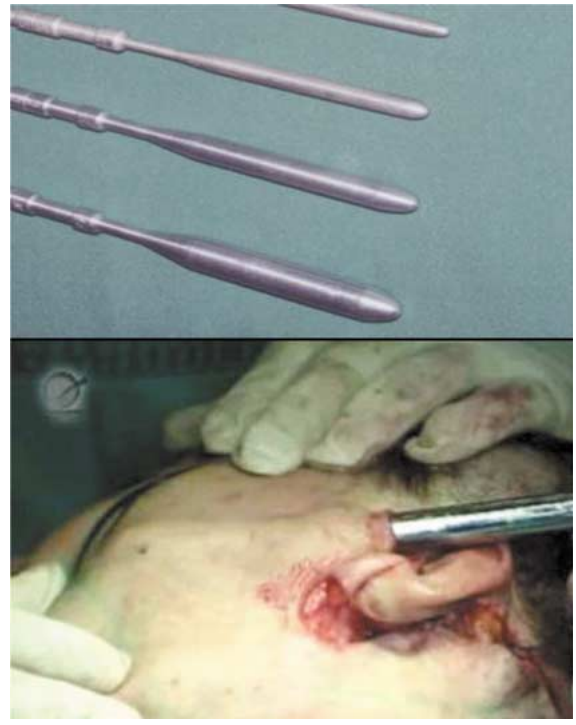

Fig. 3. Dilson Luz Vascular Dilation Wands. Close-up showing the active part of the wand in use.

Fig. 4. (**A**) and (**B**) Patient (age, 54 years) before surgery. (**C**) and (**D**) Same patient on postoperative day 7 after face-lift, upper and lower blepharoplasty, and treatment of the platysma bands.

4. Next, increasingly larger wands are passed through the same area progressively (i.e., 4.0, 6.0, and 8.0 mm, consecutively), using sizes up to 20 mm if necessary, until complete progressive cutaneous detachment of the half face is achieved (Fig. 3). Only the Dilson Luz Vascular Dilation Wands are used for the detachment.
5. At the point where approximately 90% of the hemiface is detached, using the wands, minimum bleeding is verified, usually avoiding cauterization.
6. The temporal area is incised with a scalpel, and the detachment of the subaponeurotic region proceeds with a medium (10-mm) wand.
7. After complete progressive hemiface detachment, hemostasia by cauterization is performed. This usually is necessary only in the area of the temporal vessels, where the scalpel or scissors were used.
8. SMAS-Platysma plication follows.
9. Redundant skin is removed with scissors on the hairless skin and with a scalpel on the scalp.

Fig. 5. (**A**) Patient (age, 58 years) before surgery. Same patient on day 2 (**B**) and postoperative day 60 (**C**) after face-lift, treatment of the platysma bands, lower blepharoplasty, full facial peeling, and lip augmentation. (**D**) Same patient on day post-operative day 3.

10. Conventional suturing is performed, with details for the new tragus formation.
11. A tubular aspiration drain is placed in the detached area, to be removed within 12 to 48 h.
12. An identical procedure is performed on the other hemiface.
13. Finally, the classic occlusive dressing, using cotton and crepe bands, is applied to the area. It will be changed within the following 12 to 24 h.

Discussion

The photographs of our patients taken during the immediate and late postoperative periods show a minimum of edema. This minimal edema is attributable to the reduced degree of damage to the skin during detachment using the Dilson Luz Vascular Dilation Wands. We verified reduced ecchymosis as well (Fig. 4C). When face-lift was combined with peeling, we observed increased edema, but without ecchymosis (Fig. 5B).

The current procedure did not yield any cases of hematoma, significant ecchymosis, or facial nerve damage (either temporary or late). One case of infection was identified on postoperative day 3. The patient was a diabetic female, who was treated without further complications. One female patient experienced residual postoperative edema, which persisted for 3 weeks. We attributed this to a hypertensive crisis, which occurred during the surgical procedure. The crisis persisted for the following 48 h, and the patient was treated without further complications.

Skin flap detachment performed with the Dilson Luz Vascular Dilation Wands requires 15 to 25 min and allows a thicker skin flap with better vascularization. We observed that very few vessels needed cauterization. Finally, we observed that facial detachment using this technique avoids the cutting of facial nerve endings. Because cauterization rarely is needed when we use this method, thermal damage to the adipose tissue and nerve endings also is avoided. Such thermal damage is common with traditional detachments, which need multiple cauterizations.

Conclusion

We conclude that this technique of using Dilson Luz Vascular Dilation Wands for detaching the facial flap is a pioneering method that offers several enhance-

ments to current techniques including reduced need for cautery, better vascularization of the flap, reduced ecchymosis, prevention of facial nerve injury, reduced procedural time, and above all, the absence of postoperative hematoma (Figs. 4 and 5).

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