

Chapter 33: Liposuction in Facial Plastic and Reconstructive Surgery

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Techniques for removal of localized fatty deposits have undergone a rapid evolution. Alternatives to the traditional method of sharp resection of excess fat have been developed and refined in the past 30 years. Although there are differences between them, the techniques all share the concept of suction-assisted lipectomy with minimal scar formation. The use of liposuction in the head and neck, especially in the submentum, has gained wide acceptance. It may be used as an isolated procedure or as an adjunct to other operations both aesthetic and reconstructive.

The creation of subcutaneous tunnels with scissors, followed by curetting of fat was termed *lipexeresis* by Schrudde in 1964. The tunnels were then irrigated copiously and suctioned of remaining fat before the skin was sutured and pressure dressings were applied (Grazer, 1983). In the mid-1970s, Kesselring developed an instrument, the suction curette, in an attempt to design safer instrumentation than that previously used for lipexeresis. The instrument was a stainless steel tube tapered at the tip, with the distal end having a lateral longitudinal opening bridged by a recessed blade (Kesselring and Myer, 1978). In 1977, Illouz described the technique of *lipolysis*, in which a hypotonic saline and hyaluronidase solution was infiltrated in the site to be aspirated to achieve disruption of adipocyte cell membranes and thus easier aspiration. He developed smaller caliber, blunt-tipped cannulae without cutting blades, which were then connected to high-vacuum pumps. The technique involved the creation of tunnels, which centered at the incision site, resembling a fan or the spokes of a wheel. The concept was to maintain bridges between the skin and deeper tissues, thus preserving blood vessels and lymphatics. Care was taken not to direct the cannula opening towards the skin so as not to damage the dermis and create dimples or scars (Illouz, 1983). In a further evolution of this technique, Fournier and Otteni achieved the same results without prior injection of any solution. They described the "to-and-fro" action of the cannula that was thought mechanically to place pieces of fat within the lumen to be cleared by the suction. Examination of the emulsified material from both "wet" and "dry" techniques demonstrated the presence of undamaged fat cells in the tubing. It became apparent that it was possible to aspirate fat cells without the distortion that might result from the injection of solution. They also stressed the creation of a honeycomb-like pattern, leaving septae within undamaged connections between the tunnels, thus obtaining a healthier skin flap and smoother results (Fournier and Otteni, 1983).

Patient Selection

The ideal patient has localized areas of fatty tissue excess rather than generalized obesity. The quality of tissue elasticity and turgor will determine whether the skin will contract enough to drape the smaller contour without sagging or whether skin excision will be required. The former case usually involves young individuals with isolated, localized fat deposits, whereas the latter encompasses patients undergoing procedures to treat the aging face. Classically, rhytidectomy has been performed using sharp dissection. Often, however, despite full skin-flap elevation with excision and advancement of redundant skin combined with plication of the superficial musculoaponeurotic system (SMAS) and platysma banding, results may be suboptimal because of regional fat accumulations. Removal of fat in the

submental, submandibular, and jowl areas has been difficult with sharp dissection. Liposuction easily accomplishes the removal, with resultant improvement of the facial contour (Temourian, 1983). Some have espoused using the liposuction cannulae to elevate the rhytidectomy skin flaps (Newmann and Fallick, 1984).

Patients who lack definition of the cervico-mental angle because of fat accumulation in the submental and submandibular areas are good candidates for liposuction. If needed, a chin implant can be placed through the same incision used for the liposuction. Similarly, liposuction can be helpful in conjunction with platysma plication procedures. The depression occasionally seen in the anterior neck following excessive sharp removal of fat in this area is rarely seen with careful liposuction technique.

In an effort to maximize the aesthetic results of reconstructive procedures, liposuction can be used to debulk myocutaneous flaps. Patients who have undergone pedicled and free flaps can benefit from recontouring and debulking with liposuction. This has been demonstrated in both experimental and clinical settings (Cueva et al, 1988; Hallock, 1985).

Technique

Most procedures are performed using a combination of local infiltrative anesthetics and intravenous sedatives. Local anesthesia alone may be adequate when small, isolated areas are treated. Preoperative marking of the localized fat deposits should be done with the patient in an upright position.

The essential equipment is quite simple; the variety of cannulae and vacuum pumps available is testimony to the individual preferences of surgeons rather than absolute necessity. For facial liposuction, 2- to 6-mm spatula-tipped cannulae have proved to be useful (Fig. 33-1). In terms of the vacuum pump, the key criterion is that it generates approximately 0.75 to 1 atmosphere of negative pressure. A practical consideration is the ability to reach this pressure quickly, so that there is no waiting time during the procedure. The dimensions of the suction tubing should be such that it does not become clogged with the emulsified material and does not collapse with the negative pressure (Fig. 33-2).

The incision for "closed" liposuction should be small and slightly distant from the localized area of excess fat. Ideally, it is placed in a hidden area such as below the mandibular border or inferior to the ear lobe (Fig. 33-3). The length of the incision should be sufficient to allow the cannula to be redirected without causing trauma at the skin insertion site. The proper depth of undermining depends on the area being treated but is generally in the subcutaneous plane, leaving a small amount of fat against the dermis. The cannula should be inserted without suction to avoid damage to the skin edges at the insertion site. Pre-tunnelling with serially enlarging cannulae helps dissection and prepares the wound for admittance of the largest cannula. The 2- and 4-mm cannulae are used without suction followed by the 6-mm probe connected to high suction. Once situated, the cannula is moved back and forth in a radial or fan-shaped manner with the aperture directed away from the skin at all times (Fig. 33-4). Although small cavities may be created, an intentional side-to-side motion to divide septae that may contain vessels is not recommended. An additional zone beyond the localized fat is tunnelled without suction to create a feathering effect, thus obviating abrupt changes in contour.

"Open liposuction" is the term used when the technique is performed beneath a skin flap under direct vision. In the face this is commonly done in conjunction with a facelift. Once the flap has been elevated the fat superficial to the SMAS is suctioned. The surgeon may then continue with the routine rhytidectomy including SMAS plication or imbrication. A good rule is not to dissect beyond a line that bisects the zygomatic arch. Risk of injury to the facial nerve branches increases as one moves anteriorly. In addition, liposuction can be safely carried between the medial borders of the sternocleidomastoid muscles down to the suprasternal notch in a plane superficial to the platysma. Most often, however, it is not necessary to go inferior to the hyoid. Suction of the nasolabial fold areas through intranasal incisions has been advocated. This procedure increases the risk of facial nerve injury and has not been found effective by us.

Assessing the correct amount of fat to be removed is based on preoperative planning and intraoperative observations. Palpation of the skin pinched between the thumb and forefinger will give some indication of the amount of fat removed. Close observation of the material in the tubing will also give some indication of the quantity.

At the conclusion of the procedure, the small skin incision is closed in a single layer. External compression helps obliterate potential dead space and should be continued for 2 to 3 weeks postoperatively. We have not found drains to be necessary except in unusual circumstances.

Complications

Although possible, complications have been quite rare when care is taken to follow the guidelines presented here. Because the lipectomy creates potential dead spaces, seromas and hematomas are possible. The use of compression dressings will minimize their occurrence. Contour irregularities are of major concern, particularly in purely aesthetic procedures. If the deformity is a result of inadequate removal of fat, a second operation will remedy the situation. Marked depressions resulting from excessive fat removal or damage to the overlying dermis are much more difficult to treat. Injury to branches of the facial nerve can occur if the dissection proceeds too far anteriorly on the face or in the incorrect plane. It is very important to stay in a plane superficial to the platysma to avoid damage to the marginal mandibular branch. In addition, excessive pressure with the cannula along the mandibular border can similarly injure the nerve. Cardiovascular complications following aspiration of large volumes of fat may occur because of major fluid shifts. Typically, this is not a major consideration in procedures of the face or neck because of the relatively small amounts of fat removed. Free fat has appeared in the patient's urine, indicating the possibility that free fat may exist in the blood. Although fatty pulmonary emboli are a theoretic possibility, they have not been documented following a head and neck procedure.

Other Applications

The total value of liposuction in facial plastic and reconstructive surgery has yet to be determined. Thus far it has proved to be valuable in addressing problems from which the classic open, sharp lipectomy technique is inadequate. Other possible uses of liposuction have been suggested, such as an adjunct to tracheotomy in the massive neck (Fedok et al, 1990), for treatment of congenital infiltrating lipomatosis of the face, and removal of the buffalo-

hump deformity that is seen with chronic steroid use. Other applications await the work of innovative surgeons.