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**LIPOPLASTY**

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## Serial Suction Lipectomy

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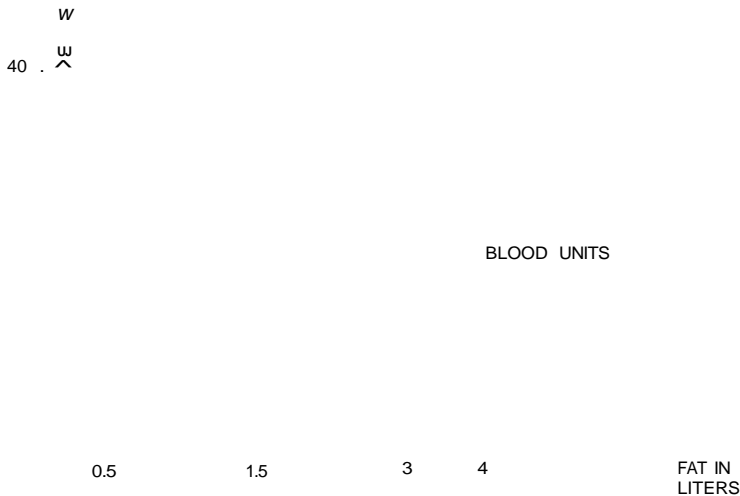
When suction lipectomy became popularized in the early 1980s, its long-term effects, benefits, and limitations were not known. Initially, we performed this procedure in the hospital under general anesthesia with hospitalization ranging from days to weeks, and carefully monitored our patients. Analysis of these experiences led us to consider outpatient applications for this new technique, and it was obvious that small amounts of fat (a few 100 cc) could easily and safely be removed by suction lipectomy with local anesthesia. Review of our early results for larger resections revealed that suction lipectomy of over 3000 cc at one time required a blood transfusion. More specifically, as seen in Figure 1, excision of 4 liters of fat required two units of blood; excision of 6 liters of fat required three units of blood, and resection of 8 liters of fat required six units of blood. These early cases were performed before the use of exogenous blood bank blood was known to carry new pathogens. Since that time, we have had patients refuse elective surgery if blood bank blood might be required under any circumstance. As a result of this deep concern by us and our patients, we analyzed our data and reviewed our thinking on this matter and concluded that the removal of 2 liters of fat under local or general anesthesia is safe without transfusion. We therefore adopted the policy that we would remove a maximum of 2 liters of fat in a single session as an outpatient procedure and require every patient to donate a unit of blood for the possibility of autologous transfusion if some untoward event should necessitate blood replacement. After 4 years of this practice and more than 1000 suction lipectomy procedures, we have never admitted a single patient to the hospital unexpectedly, and we have never

given a single unit of exogenous blood bank blood. In general, if the amount of fat removed is in the range of a liter or so, the patient's autologous unit of blood will be donated to our Travis County Medical Society Blood Bank. This is viewed as a benefit to all concerned, since our blood bank then has unusual donors added to the pool, and the patient has had the safety of the backup of his own unit of blood. If we remove close to 2000 cc of fat, we usually will give approximately a liter or so of intravenous saline during the procedure and at the end of the operation give the patients their own blood while they are in recovery. If they require any fluid replacement after surgery, replacement with their own blood seems to be physiologically ideal.<sup>1</sup>

The rationale for waiting until after surgery is completed is to conserve the red cells. Since patients are receiving saline in their intravenous drip, they will be somewhat hemodiluted during surgery. It is at this time that substantial amounts of subcutaneous fat and tissue and a small amount of blood will be removed. By hemodiluting at this time, the volume of red cells removed with the fat will be minimized. Then, after the surgery is completed, and the body is beginning to equilibrate, the addition of a unit of autologous blood will be of benefit to the intravascular volume and will not be leaking out the other end, so to speak, at the ruptured capillary bed of the subcutaneous fat. Waiting until the procedure is completed, of course, assumes that moderate amounts of fat are removed (2000 cc or less) and that no untoward events occur, and that the patient has not been significantly hemodiluted by this procedure.

Since developing this technique, we have not

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**Figure 1.** Blood requirements after suction lipectomy.



performed a single suction lipectomy procedure in the hospital. During this 4-year period, 200 patients have been treated as serial suction lipectomy patients, wherein approximately 2000 cc of fat were removed by suction and then a minimum of 6 weeks would be allowed to elapse for the maximum healing and equilibrium to take place, and then an additional 2000 cc would be removed. Although we do not advocate suction lipectomy as a treatment for generalized obesity, several of our patients would qualify as obese by any standard, and many have felt their condition has been improved by the removal of many liters of fat over many months. While we have had several patients report substantial weight reductions following suction lipectomy, we have also had several patients whose weight has increased 10 to 15 pounds within 6 months of suction lipectomy, and at this time, we are hesitant to make any conclusions regarding the benefits of serial suction for weight reduction.

Our most dramatic case is that of a general surgeon from West Texas who developed a progressive deposition of lipomas throughout his body at about age 28 (Fig. 2). By the time he came to us at age 40 years, he had these lipomas biopsied at the Royal College in London, and they were diagnosed as normal fat. We removed 9500 cc of lipomas over a 3-year period in nine sessions, ranging from 500 cc to a high of 2750 cc per session. During this period, he was hospitalized for one episode when we treated his abdomen and back under general anesthesia. For all the other sessions the patient was treated as an outpatient, was placed under local anesthesia, and received diazepam and ketamine. Because he was able

to come on a Thursday or Friday and be discharged in a day or two, he was able to be back to work as a general surgeon by Monday each time, and never missed a day's work. By having one area, such as a forearm, calf, or thigh treated at a time he was able to minimize his discomfort and continue to work during the entire period. Because of the multiple, relatively small excisions, he was able to function as a general surgeon, even though he might have one painful area. One week prior to surgery, one unit of autologous blood was stored for the patient's operative use, and no exogenous blood was given.

### DISADVANTAGES

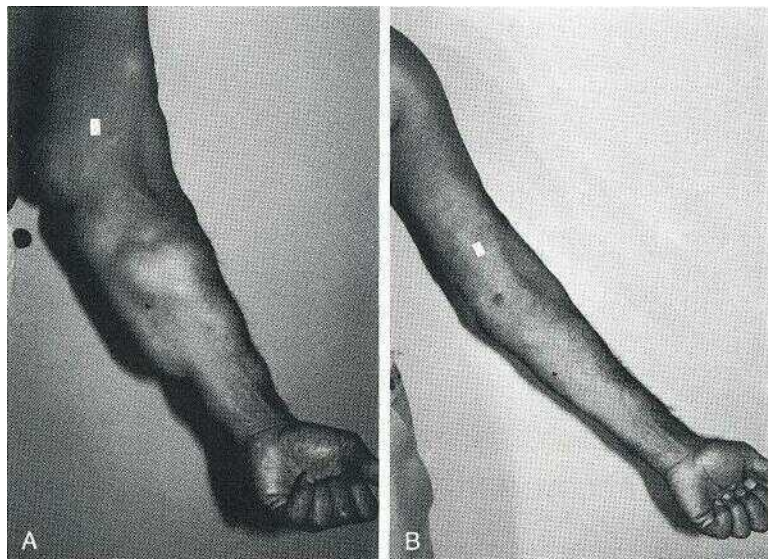
The disadvantages of serial suction lipectomy are

1. Time. Patients may lose interest before the completion of the series, because of the prolonged time, months or even years, during which treatment must proceed before the ultimate result is achieved.

2. Scar. After suction lipectomy has been applied to an area such as the abdomen, the multiple honeycomb areas of resection heal by formation of some scar tissue. This scar tissue formation makes subsequent suction much more difficult, because of the increased resistance of the cannula going through these partially scarred tissues. In addition, it is possible to have this scarring of the area cause an adherence of the skin to the underlying muscle fascia so that the cannula may be inadvertently punctured through a stria or other scar (Fig. 3).



**Figure 2.** A. This 40-year-old male general surgeon has progressive nodular lipomatosis. This disease began at approximately age 28 with the appearance of a few lipomas that increased in size as he aged. These were biopsied on numerous occasions and always found to be "normal fat." B. Removal of these subcutaneous nodules by the serial suction method enabled us to remove 9500 cc of this subcutaneous fat with only 1 hospitalization of 3 days with no exogenous transfusion and this patient never missed a day's work. Suction was done on a Friday and he was back to work after each episode by Monday.



3. Pseudobursa. Suction lipectomy followed by a period of healing and subsequent resection of skin may result in a pseudobursa formation owing to the multiple tunnels of suction lipectomy that are confluent with the area of resection (Fig. 4).

4. Asymmetry. The partial treatment of different areas of the body may leave the patient asymmetrical between surgeries.

2. Structural Results. The structural results are gradually attained so that patients avoid sudden changes in appearance (Fig. 5).

3. Autologous Blood. Safe amounts of fat can be removed without exogenous transfusions, and the storage of autologous blood on several occasions allows the maximum amount of tissue to be removed safely, with the autologous blood as the only replacement.

## ADVANTAGES

The advantages of serial suction lipectomy are

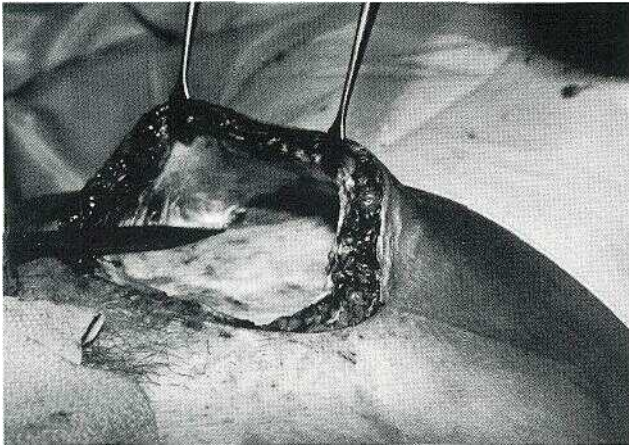
1. Outpatient Surgery. Multiple procedures can be performed as an outpatient procedure; if the treatment were all done at once, it would require days or weeks of hospitalization.

## COSTS

Although the operative time, anesthesia, and supplies may be reduced for each episode, because there are many episodes with serial suction, it is not likely that any significant cost difference will be seen by either method.

**Figure 3.** Because of the subcutaneous scarring that occurs, the skin and subcutaneous fat become more firm, so that it is more likely to be able to pierce a stria, as in this case, with a blunt cannula. The patient is a 31-year-old woman who had a total of four sessions of suction lipectomy with a total of 4850 cc of fat removed by suction, and a breast reduction. Care must be exercised when returning to an area for the second suction because of this subcutaneous scarring. If the skin can be pierced as a result, it is possible that the cannula could go in the other direction and perhaps puncture a viscus. Therefore, great care must be exercised. This wound was treated by absorbable subcuticular stitch and taping and healed without incident.





**Figure 4.** This 39-year-old woman had a combined suction lipectomy and abdominal dermatolipectomy with a resultant puckering of the skin. It was initially thought that this puckering was due to overly vigorous suctioning; upon reoperation to loosen the puckered abdominal skin, a pseudo-bursa was found. Histological studies revealed that this was a cellular and collagen lining caused by scarring and the lymphatic lake had formed to subsequent excision of the scar lining. Suturing of the layers resulted in normal healing.

### RECOMMENDATIONS

It is recommended that 2500 cc is the safe maximum suction lipectomy with one unit of autologous blood. It may be possible to remove a few more cc in some cases; however, devastating results have been seen when large amounts (over 4000 cc) of fat have been removed without prolonged hospitalization. Our experience and that of dozens of other authors<sup>2,9</sup> has shown that 2000 cc of subcutaneous fat can be removed safely without transfusion. By having an autologous unit of blood available, 2500 cc of subcutaneous fat may be removed, and subsequently replaced with one unit of blood safely and dependably. It should be our goal to determine the safe methods for suction lipectomy and adhere to those guidelines. There is no benefit in learning what the endpoint might be of the LDgo for suction lipectomy. It is only by adherence to the well-

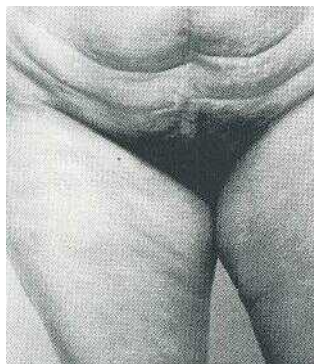
established physiologic principles of surgery and hands-on training that danger can be avoided.<sup>10</sup>

### SUMMARY

Serial suction lipectomy is a safe method whereby larger areas and larger amounts of subcutaneous fat can be removed in several subsequent steps to minimize transfusion, minimize hospitalization, and maximize the improved health and safety of our patients. Six weeks should elapse between major resections, and a maximum of 2000 cc can be removed at one time unless transfusion is available.

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**Figure 5.** This 35-year-old woman had approximately 6000 cc of fat removed by suction lipectomy over a 4-year period in five different sessions. In addition, she has had an abdominal lipectomy and scar revision. The total weight loss during this period is about 20 pounds as reported by the patient. A, Before treatment. B, After treatment.

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