Correcting Lipoplasty Contour Irregularities

Editor’s note: My thanks to the moderator, Franklin L. DiSpaltro, MD (board-certified plastic surgeon and ASAPS member, West Orange, NJ), and to panelists Kristoffer Ning Chang, MD (board-certified plastic surgeon and ASAPS member, San Francisco, CA); Mary K. Gingrass, MD (board-certified plastic surgeon and ASAPS member, Nashville, TN); and Charles E. Hughes III, MD, board-certified plastic surgeon and ASAPS member, Indianapolis, IN), for sharing their opinions and clinical experience.

Dr. DiSpaltro: Let us start with a couple of general questions. First, Dr. Hughes, how often do you see a patient in your practice who needs fat grafting as a concomitant procedure?

Dr. Hughes: Including those patients who come to me with defects, I probably perform fat grafting on about 30% of my lipoplasty patients.

Dr. Chang: In my lipoplasty patients, fewer than 1% to 2% require fat grafting in secondary procedures.

Dr. DiSpaltro: Are there patients who are at a higher risk of having contour irregularities develop?

Dr. Chang: One has to be careful in treating women who have delicate, fair skin and soft, localized fat.

Dr. DiSpaltro: Our first patient is a 54-year-old woman who presented for correction several months after lipoplasty. Her complaint was that she had multiple indentations in the anterior thighs, distal medial thighs, groin, and lower abdomen (Figure 1). How would you evaluate this patient, and how would you mark her?

Dr. Hughes: I would sit with the patient and carefully review each area. I use 2 identical sheets with a template. I have the patient draw the areas that are personally bothersome and the corrections they would like done. Then I use a separate sheet for my own plan to address those areas. I use a series of 3 different colors of water-soluble markers when I see patients in consultation. I mark the patient, take pictures, and we talk about what we are going to do until I am comfortable that the patient under-
stands the plan. The marks wipe off with water and a warm washcloth.

**Dr. Chang:** Marking is extremely important in planning the surgery. I mark out 3 areas: the first is the area of maximal fat deficiency, the second is the area of maximal fat excess, and the third are the intermediate areas. The area of depression would receive fat, the fullness is where fat is to be removed, and the intermediate areas will be left alone.

**Dr. Hughes:** In the groin, you have to be extraordinarily cautious, and I would not promise this patient much improvement in that area. I think the medial thigh on the left is larger than the medial thigh on the right. I cannot tell from the picture whether this is caused by a medial muscle difference or totally by fat. But I would probably suction there, as well as feathering the area right next to the indentation on the lateral left thigh where she needs a graft.

**Dr. DiSpaltro:** In the lateral thigh, how would you estimate the amount of volume that you would have to replace in addition to how much you would feather along the margin of the defect?

**Dr. Hughes:** I basically use very fundamental geometry to measure the volume. By the end of the consultation, I have notes about how much fat I think I am going to need for each defect and also how much I think I am going to remove in different areas. I actually measure the space, calculate the volume, and add about 30%.

**Dr. Chang:** The exact volume will be different in every case. There is not a hard-and-fast rule in terms of a number. It is empirical. You inject until you see that the contour is improved and until there is slight overcorrection.

**Dr. DiSpaltro:** In preparing the fat for injection, do you use any type of centrifuge, or do you use a gravitational settling?

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**Figure 1.** A 54-year-old woman presented for correction several months after an initial procedure. She had multiple indentations in the anterior thighs, distal medial thighs, groin, and lower abdomen.

Soft, loose fat is most prone to contour irregularity. This kind of fat comes out very quickly, and is easy to over-resect.

—Mary K. Gingrass, MD
Dr. Chang: I use gravity. I use a vacuum aspirator, and the specimens are collected in a sterile specimen jar or directly from the patient end of the lipoplasty tubing. I will simply decant it and separate the fat from the liquid. I think the less you meddle with fat, the better it takes. I personally use as little wetting solution as possible to maximize the solidity of the fat.

Dr. Gingrass: I also use gravity.

Dr. Hughes: When I perform fat grafting, I use a syringe to harvest the fat. I do not do anything fancy, just syringe and centrifuge. I most commonly use a Mercedes cannula, or sometimes I use a cannula with 3 side openings if I really need to direct the resection.

Dr. DiSpaltro: In our first patient, why do you think the contour defects occurred?

Dr. Hughes: One can only guess. In positioning a patient face down to perform lipoplasty of the lateral thighs, sometimes you can be deceived and take out more fat than you realize. That is why when I operate on a patient whose skin may be a bit loose, I often will place the patient in a lateral position to perform lipoplasty of the lateral thighs. This problem could also be a result of the choice of cannula. Judging from the size of the groove, I suspect that a 6-mm or larger cannula was used. Although it is more work, I tend to use smaller cannulas. My workhorse is probably my 3.7-mm cannula. I do not often work with a larger cannula. However, in a very large patient, when I am suctioning with an abdominoplasty, I will use a cannula in the 4- to 5-mm range. Let us say you are going to use an infiltrate-to-aspirate ratio of 1.5 to 1; you have to be very careful not to add more fluid on one side than on the other, or you can easily be deceived about how much fat you are taking out.

Dr. DiSpaltro: As you proceed to the lateral surface of the thigh, you are in an area where you can rapidly drop off in volume.

Dr. Hughes: Absolutely. I think that the major error was that the surgeon came in too far anteriorly. I would suspect that the patient was not marked this way; my guess is that this was a positioning problem.

Dr. DiSpaltro: What else could be done to further improve this patient’s result?

Dr. Hughes: I also think a subtle improvement could be achieved by suctioning her medial knees. That will give her legs a better overall shape.

Dr. DiSpaltro: The next patient is a 58-year-old woman who had a mini-abdominoplasty, lipoplasty of the abdomen, and a revision 3 years ago (Figure 2). She now presents with deep dents and ridges of the abdomen. What do you see as the findings in this patient?

Dr. Gingrass: It appears that she might have had a postoperative seroma or a prolonged edema problem with some postoperative fibrosis and contour irregularity of the lower abdomen. The abdomen looks like it may be firm. It could have been indurated for a long time. I would want to examine her and feel what the area is like on palpation. The questions here would be, “does this need to be revised with surgical excision, or can it be revised with suction; does this need to be undermined and redraped?” It is difficult to judge without a lateral view, but I might be tempted to revise her with a full abdominoplasty if there is enough...
laxity of the superior abdominal skin. If not, I think I would re-elevate the mini-abdominoplasty flap, excise the scar tissue under direct vision, and redrape the skin. In this case, you have the advantage of a skin incision which is already there.

**Dr. DiSpaltro:** Do you have any ideas as to what contributed to the development of the bulge in the lower abdomen? What steps would you take to avoid this?

**Dr. Gingrass:** If there was a lot of suctioning done, using a drain would be one thing, and good post-operative compression would be another. If you are going to suction and undermine at the same time, I think it is important to drain. I think compression foam is also helpful in the abdominal area.

**Dr. DiSpaltro:** Do the rest of you also advocate the use of drains where you have a simultaneous mini-abdominoplasty and suction procedure?

**Dr. Hughes:** I agree with Dr. Gingrass. I would also follow the patient very carefully to see whether a seroma develops. I do not hesitate to put in a drain if necessary.

**Dr. Chang:** If it is a full elevation of the skin flap, I use a drain. In terms of prevention, this case is a problem of over-resection. Simply too much fat has been removed, and there is some fibrosis in the area where one sees the maximal indentation.

**Dr. Hughes:** I think that frequently the suprapubic area is overlooked. Some minimal work could help correct contour irregularities in this area. Any revision would be minor, and I would use a very small cannula.

**Dr. Gingrass:** A lateral view would really help. But I agree that more suctioning of her mons pubis might improve the result.

**Dr. DiSpaltro:** The next patient is a 30-year-old woman who underwent traditional lipoplasty of the bilateral saddlebags; she presents 1 year later with concerns about asymmetry and indentation (Figure 3). How would you go about the evaluation of the patient, what do you see, and how would you plan a correction?

**Dr. Chang:** She is a young woman, so her skin tone should be good. It appears the problem is over-resection or oversuction of the upper posterior thigh, and this over-resection extends to the posterior lateral thigh area. There is a continuous area where too much fat has been removed, and you can see the way the skin folds from a deficiency of the fat. One correction would be to do the fat grafting; another would be to remove some fat from around the area of excess.

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Too much fluid has been infused, which makes it easy to remove the fat and obliterates that end point that used to be seen with the dry and wet techniques. One does not know when to stop because the fat that comes out is white or fairly white, and so it is easy to remove too much.

—Kristoffer Ning Chang, MD

depression. Basically, I would stick to the formula of aspirating fat from the areas of protuberance and fat grafting to the areas of depression. The area of suction would be superior to the lateral thigh and perhaps anterior to that area as well. Caudal to that area is a little fullness below the indentation. I would also aspirate the midposterior thigh, where there is some fullness. I would collect all the fat, in addition to fat from some other areas, for fat grafting. These other areas would be the medial thighs where there is some fullness, the medial knees, and possibly the anterior thighs and the buttocks. This fat would be injected into the area of maximal depression. That would be the simplest and least invasive way of correcting this problem.

Dr. DiSpaltro: At what depth are you placing your graft material?

Dr. Chang: It is very important to deposit the fat at different levels, in different passes, and at various angles. But one thing I also do is to pass a blunt tip cannula beneath the area of depression without suction. I do that to mobilize the tissues. I do that quite a few times to create some tunnels. Then I inject very, very slowly.

Dr. DiSpaltro: Do you inject as you withdraw?

Dr. Chang: Yes.

Dr. Gingrass: Do you use a ratchet?

Dr. Chang: No, I do not. I just use a 10- or 20-mL syringe. I find that a ratchet delivers the fat too quickly.

Dr. Hughes: I use the ratchet gun with the 10-mL syringe loaded into it. We rinse our fat grafts in sterile ringers until they are clear. When I use a ratchet gun, I start at the bottom, and I lay 1- to 2-mm strips along the base. I place a layer in one direction so that I am going 90 degrees to my original level. As I come to the surface, I have a row of parallel strips, and then on top of the row of parallel strips, I go 90 degrees to the original and then back to my first grid. The grid technique provides for a better blood supply and vascular in-growth. Many times I have told patients we are going to need to do this 2 or 3 times, expecting a fair amount of loss, and only about 10% of the time do I actually have to go back and do a second graft.

Dr. DiSpaltro: Do you overcorrect, or do you aim for what you have estimated to be the true amount of correction needed?

Dr. Gingrass: I do 20% to 30% overcorrection.

Dr. Chang: I do slight overcorrection, a little beyond the contour that I would like. But I do not overinject. I think too much fat could lead to hardening of the subcutaneous area and a poorly vascularized graft. So I try to use the correct amount.

Dr. Hughes: Like Dr. Gingrass, I overshoot 20% to 30%.

Dr. DiSpaltro: Statistically, what percentage of the grafting material truly survives?

Dr. Chang: I have been amazed at how much fat survives. When I first started, I did not expect it to survive at all. My impression is based on needle biopsies. Somewhere between
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—Charles E. Hughes III, MD

50% and 70% of the fat survives. I think there is a certain amount of fibrous tissue that builds up, too.

Dr. DiSpaltro: What do you think led to the problem that we see in this patient?

Dr. Chang: There are several possible causes. One is overinfiltration of wetting solution. This can be a fairly prevalent problem. Too much fluid has been infused, which makes it easy to remove the fat and obliterates the end point that used to be seen with the dry and wet techniques. One does not know when to stop because the fat that comes out is white or fairly white, and so it is easy to remove too much. Too much infiltration also allows one to harvest all the layers of subcutaneous fat, including the deeper part that supports the buttocks and the more superficial part that provides a nice fullness.

Dr. Hughes: I think that the surgeon probably dissected a little too distally. I also agree with Dr. Chang that it is a matter of infiltrating too much and excessive removal in the wrong places.

Dr. DiSpaltro: This is why it is so important to make sure your markings are very accurate before you position the patient on the table. That is your last chance to really assess the areas and the amount that you are going to dissect.

Dr. Hughes: Correct. In this patient, her opposite lateral thigh might also be a good donor site. Taking some fat from there is going to give her a better overall contour and produce a happier patient. A patient who comes to you with secondary problems is upset over the first procedure. It is probably the only time I suggest additional areas to patients in an effort to make sure that after that secondary procedure, they can see a very nice difference.

Dr. Gingrass: The opposite side has a significant banana fold. The surgeon must have suctioned very superficially on that side.

Dr. Hughes: I believe that 70% of contour irregularities are surgeon-induced and 30% are caused by equipment.

Dr. Chang: I think the surgeon factor is a significant one in producing contour irregularities. It is how the surgeon uses the instruments. In other patients, contour irregularities may be caused by factors such as the variable extractability of fat in different people and from different body areas. In certain patients who have thicker skin and more fibrous fat, however, ultrasound can actually produce a smoother result. If the cannula moves more easily, I think that helps.

Dr. Hughes: The key strategy to avoiding problems is to define your operation carefully before you ever get to the operating room, have a good plan in mind, and be flexible enough to adjust as needed.