Ultrasound-assisted Lipoplasty and Suction-assisted Lipoplasty

Editor's note: My sincere thanks to the moderator, Franklin L. DiSpaltro, MD (board-certified plastic surgeon, West Orange, NJ), and to panelists Mary K. Gingrass, MD (board-admissible plastic surgeon, Nashville, TN); Charles E. Hughes III, MD (board-certified plastic surgeon, Indianapolis, IN); Gerald H. Pitman, MD (board-certified plastic surgeon, New York, NY); and Rod J. Rohrich, MD (board-certified plastic surgeon, Dallas, TX) for sharing their opinions and clinical experiences.

**Dr. DiSpaltro:** The first patient (Figure 1) is a 25-year-old woman who is in good physical condition. She is a weight trainer and wears skimpy swimwear. She is bothered most by her trochanteric and posterior thighs. Dr. Gingrass, how would you manage her problems?

**Dr. Gingrass:** I would manage the posterior hips with suction-assisted lipoplasty (SAL) alone, mainly because she has extremely minor fat deposits in that area, so I could not justify making the large excision needed for ultrasound-assisted lipoplasty (UAL), especially because she wears very skimpy swimwear. I would treat the saddlebags and posterior thighs with UAL because I could hide the incision in the gluteal crease and believe that UAL would give me more control. However, I would never argue against treating this area with SAL only; UAL is just my preferred tool.

**Dr. DiSpaltro:** How much longer would it take you to treat this patient with UAL as opposed to with SAL?

**Dr. Gingrass:** It wouldn’t take me any longer to treat a case of minor fat deposits like this with UAL versus with conventional liposuction. On a larger case, I would treat each trochanteric area with UAL for 6 to 8 minutes, and then evacuate the remaining fatty emulsion, which would take another 2 minutes or less. The average UAL case takes me 10% to 15% longer.

**Dr. DiSpaltro:** How do you determine the contour that you want to create in the lateral femoral trochanteric area?

**Dr. Gingrass:** In the preoperative period on the day of surgery, I take a Polaroid photograph of the patient. I draw the contour that I envision for the patient on this photograph to determine whether he or she has a similar result in mind. I can’t always achieve exactly what I draw, but this at least helps me aim at the patient’s desired result. I know the exact contour that I want for a patient like this; I want to get rid of the violin shape and create a smooth transition from hip to distal thigh.

**Dr. DiSpaltro:** Dr. Hughes, what approach would you take with this patient?

**Dr. Hughes:** I would treat this patient with SAL alone because I think she needs a procedure with only a very small cannula. I would suggest to her that with SAL I
could make very tiny incisions with a 3 mm cannula and treat the areas that she would like improved. Because she is obviously very particular about her silhouette, I would also inform her that once the lateral trochanteric area is brought into harmony, she might notice a very slight excess of fat in the hip area—25 to 30 ml at most. I agree that using UAL to treat minor fat deposits like these wouldn’t add any extra time to the procedure.

**Dr. DiSpaltro:** I think we all agree that the surgeon who is just beginning to use UAL should not use it on this type of patient.

**Dr. Gingrass:** Absolutely not. The novice would be risking overresection in a case of minor fat deposits like this.

**Dr. Rohrich:** Because this patient needs only finesse liposuction, it would be necessary to inform her of the various small subtleties that you wouldn’t have to point out to the typical patient undergoing liposuction. I tell all of my patients that we are all asymmetric, we all have dimpling, and she is going to have these characteristics postoperatively. This patient is more asymmetric on the right than on the left—that is, she has more fullness in her right lateral hip area. She is very fit but still has dimpling in her left posterior banana roll. We would discuss these factors during the initial consultation and look at the photographs again the morning of surgery.

I always point out the areas that I suction, but more importantly in a case like this, I would point out the areas that I don’t suction, such as the area of gluteal adherence, the intermediate area of the inner thigh, and the distal lateral thigh region. We would discuss why it is important not to suction these areas so the patient wouldn’t feel there were any discrepancies postoperatively. I always let patients tell me what they believe is the problem. I ask them to list two to three areas that they would like improved. I would treat the medial thighs and medial knees with SAL alone. This woman is young and has good skin tone, so I don’t think we need the advantage of ultrasound in her case. I would suction through an inferior lateral gluteal incision, and would suction in the intermediate plane laterally and then superficially in the medial thigh and inner thigh. I would also suction the intermediate plane of the hip area.

**Dr. Pitman:** This patient is perfect for circumferential liposuction of the thighs. By circumferential, I mean the trochanteric areas, posterior areas, medial thigh and knee areas, and anterior thigh. She has very little protrusion of the outer thighs but rather a much more uniform fullness. Although most women would find this appearance attractive, this woman probably feels that her thighs are too full because she is quite thin, particularly in the torso. Removing small amounts of fat circumferentially at an intermediate level and deep level (as opposed to right underneath the dermis) would give her a striking overall diminution in contour.
In cases of this type, I use only very narrow gauge cannulae (2.4 and 3.0 mm, Mercedes type). One must be particularly careful in the anterior thigh area because it is quite easy to create irregularities and depressions. In this patient I would not expect to see any change in the slight irregularities beneath the horizontal gluteal crease; they will persist. However, one could expect a dramatic diminution in overall contour.

Dr. Hughes: In a patient who is this physically fit with very little subcutaneous tissue anteriorly, I would not suction the anterior thighs.

Dr. Pitman: I respect Dr. Hughes’ judgment in this case. Nevertheless, I find that patients greatly appreciate the overall reduction in contour that occurs with circumferential liposuction. As long as at least a 3 cm pinch exists on the anterior thigh, fat can be removed without creating irregularities if 2.4 and 3.0 mm cannulae are used, and resections are limited.

Dr. DiSpaltro: Dr. Hughes, would you do anything special in terms of the postoperative management of this patient? She is a vigorous exerciser. How soon could she resume her physical routine?

Dr. Hughes: This patient will want to begin working out again soon, and assuming that she would have a minimal amount of suction, she could resume a moderate level of exercise 1 week after surgery. She could begin exercising vigorously after 2 weeks. However, she would need to wear a properly fitted compression garment for a minimum of 6 weeks, especially if she were going to be very physically active. I have not had a problem with patients like this beginning to exercise again 1 week postoperatively as long as they wear the garment.

Dr. DiSpaltro: Would the patient wear any particular type of garment?

Dr. Hughes: I would not recommend any one garment over another. The important point is to make sure the patient wears the garment for at least 6 weeks.

Dr. Gingras: I also prefer that patients wear a garment; however, for someone like this I would be more lenient with regard to wearing the garment after 3 weeks. I would tell this patient that she needs to wear the garment when she exercises, that she could return to work in 3 days, and that she could start walking right away.

Dr. Pitman: I don’t use garments on any of my patients except in the calves and ankles, where garments are necessary for 6 weeks. Because I pre-inject the areas to be treated with large volumes of dilute lidocaine with adrenaline, the patients leak copious amounts of fluid 48 hours after surgery. They are given instructions preoperatively on how to use drop cloths and absorbent pads to protect their clothing and furniture from fluid leakage.

Dr. DiSpaltro: The next patient (Figure 2), a 35-year-old woman, is a rising country music singer who performs on stage. She is extremely bothered by her waist and has difficulty finding clothes that fit properly because she has a very thin upper body. She has not had any previous surgery. Dr. Rohrich, how would you treat this patient?

Dr. Rohrich: First, I would discuss the importance of physical harmony.
with this patient and ask her what bothers her the most. It looks as though she has a significant amount of dimpling and depression as well as significant striae in the lateral aspect. I would point out and document these elements. I would make drawings on her preoperative photographs the morning of the surgery so that we were clear about these findings.

This patient would benefit from circumferential thigh UAL and SAL. I would tell her that I could improve her lateral and medial thighs, anterior and posterior thighs, banana roll, and hip rolls. I would also suction her buttocks. I would make a lateral inferior gluteal fold incision, where I would begin the UAL in the intermediate plane, suctioning more superficially in the banana roll area. I would treat the medial thighs with UAL as well. Then, using a small SAL Mercedes 3.0 mm cannula, I would suction the medial thighs and anterior thighs, and through a separate incision, I would suction the hip rolls.

**Dr. DiSpaltro:** What percentage of the procedure would be ultrasound-assisted?

**Dr. Rohrich:** To optimize the current UAL technology, you have to use it in conjunction with SAL. I would use UAL on this patient for about one third of the total suctioning time, and use conventional liposuction for the evacuation and final contouring. I think the time spent is less important when you have maximized the use of UAL. This is based on the lack of resistance to the cannula movement in those areas in which I've maximized the cavitation effect and yet have not had a cavity form, which increases the incidence of seroma. Using ultrasonic energy, I suction at least 1 to 2 cm beneath the skin in all areas, evacuate the emulsified fat using SAL, and do the final contouring with 3 and 3.7 ml SAL cannulae.

**Dr. Pitman:** Circumferential liposuction of the thighs—using either the conventional method or UAL—will give this patient a significant diminution in contour. UAL would facilitate increased fat removal and perhaps give her a slightly more dramatic result.

**Dr. Hughes:** This is a patient whom, when I first began using UAL, I could have treated with use of either conventional liposuction or the ultrasound method; however, I probably would have chosen SAL. Now that I've become more experienced with UAL, I believe that I can use it and achieve a far superior result in a patient like this. I would suction circumferentially and use UAL in the deeper half of the subcutaneous fat and SAL in the superficial half of the subcutaneous fat. In addition, I would use SAL to blend the margins.

**Dr. DiSpaltro:** Dr. Gingrass, where on this patient would you not use UAL?

**Dr. Gingrass:** I would not use UAL on the distal thighs and knees but rather would use SAL to blend between those areas. I would use UAL to treat the thighs circumferentially. I like using UAL to treat the anterior thighs especially because I believe that it produces a smoother result. I treat the medial thighs with UAL conservatively because I don’t want to overresect that area.

**Dr. DiSpaltro:** Where would you make your incision?

**Dr. Gingrass:** I make the incision for the anterior thigh high in the groin area. I then jackknife the patient to get the upper part of the body lower on the table than the lower part of the body. I would never make a UAL incision below the groin. Then, if I need another incision in the lower groin area, I make another stab incision and finish treating the medial thigh with SAL. I would be conservative in the upper thighs in this patient to avoid creating a banana roll. I would not suction the buttocks for fear of making them flat, which, in my opinion, is unattractive.

**Dr. Rohrich:** The buttock is a critical area, and we know that circumferential thigh SAL is effective. I believe that if you don’t suction this patient’s buttocks she will be well contoured in the thigh area but very disharmonious and thus very unhappy. The key here is not to suction superficially or too deeply in the buttocks as this will create buttock proxis.
However, UAL works great in the intermediate buttock plane; I use it with a lateral gluteal crease incision and obtain excellent results.

**Dr. Pitman:** You can certainly reduce this patient’s buttocks beautifully with either UAL or SAL. Before offering to treat the buttocks, however, I would have a preoperative conversation with her to discuss her desires because there are distinct ethnic variations in body image regarding this area. Many Caucasian women desire small buttocks, but many Latino and African-American women prefer a fuller, rounder look.

**Dr. Hughes:** Paresthesias have lasted longer when I used UAL in the anterior thighs. Although they resolve, I still discuss this with the patient preoperatively.

**Dr. DiSpaltro:** The last patient (Figure 3) is a 55-year-old truck driver who wants to be gone from work a minimal amount of time. She is 5 foot, 5 inches tall and wants to be very skinny—or at least much slimmer. She smokes three packs of cigarettes a day. Her examination reveals that she has very firm fat.

Dr. Hughes, how much does the fact that this patient is a heavy smoker influence your judgement in terms of preparing her for surgery?

**Dr. Hughes:** If this patient were going to continue to smoke three packs of cigarettes daily, I would do minimal suctioning. If she wants a really good result, she will have to commit to stop smoking 1 to 2 weeks before the surgery and for at least 3 weeks afterward.

**Dr. Gingrass:** I think we all agree that this is a patient whom we would caution to stop smoking.

**Dr. DiSpaltro:** I think we should perform liposuction on her for sure.

**Dr. Gingrass:** No. It would keep me from doing anything open on her, but I would perform liposuction on her for sure.

**Dr. Rohrich:** I don’t do facial or breast aesthetic surgery on patients who smoke. I perform liposuction on body contour patients who smoke, but I do not suction as aggressively as I would with a nonsmoker. I certainly would not perform superficial liposuction on this patient, but rather would suction in the intermediate and deep planes. I would tell her that her result will not be as good because I will not be able to suction a large volume of fat and achieve optimal contouring as a result of her smoking.

**Dr. DiSpaltro:** Dr. Hughes, what
would you advise this patient to have done considering her history of smoking? Which areas do you think would benefit most from suctioning?

**Dr. Hughes:** First I would discuss with her—either with her photographs in front of us or with her in front of a mirror—the areas that she would like improved. I would assume that she would be interested in a circumferential approach to the trunk area. I think that I could achieve a very nice result in the back and circumferentially in her legs and in her abdomen. She would need to recognize that if she were going to continue to smoke, I could not suction superficially, so there would be a distinct possibility that her skin might not contract well. I would also make sure that she understood that she could need a skin resection ultimately, and that I wouldn’t do it if she was smoking three packs of cigarettes a day.

**Dr. DiSpaltro:** Would you use UAL?

**Dr. Hughes:** Definitely. I would remove at least 50% of the fat using UAL, and perhaps even 60%. I can make tunnels much better using UAL than I ever could with SAL alone, especially in the back and in someone such as this who has this really solid fat because of some fibrous bands, which are just her dermal attachment, or her septa.

**Dr. Pitman:** This patient would get some increased skin retraction with UAL, and I would use it in the abdomen and in the thighs. However, I would caution her that she is more likely to have a seroma than a patient who has conventional liposuction, because UAL patients have more seromas in the abdomen and in the flanks, at least with the present equipment that we are using. I view this patient as a bulk resection patient; she would have to understand that she is not going to obtain a finesse result. She is also the type of patient whom I offer a lower abdominal segment skin resection because she has hanging skin.

**Dr. DiSpaltro:** Would you perform the liposuction and the skin resection during the same procedure?

**Dr. Pitman:** Yes. However, I would not do any undermining of the superior abdominal flap or attempt to tighten the musculature given this patient’s history of smoking. The lower abdominal skin segment resection is an effective, if limited, treatment for lower abdominal skin excess that adds little or no morbidity or recovery time to the liposuction procedure. It is particularly appealing to patients who do not want to undergo a full abdominoplasty and can be a good alternative for physiologically compromised patients such as this one.

**Dr. Gingrass:** If I were going to do a skin resection, I also would do the liposuction during the same procedure. However, I wouldn’t perform these procedures during the same surgery if the patient were a smoker.

**Dr. Rohrich:** I would perform both procedures during the same operation in a nonsmoking patient. If this patient stopped smoking, she would have a far better result because one could be much more aggressive in the contouring, especially in the circumferential thigh. I agree with Dr. Hughes that UAL is superb for the abdomen and the back. I would use ultrasound between the areas of depression and creases and approach the mid back through offsetting asymmetric incisions. I think asymmetry is a benefit when one has to make incisions because it prevents patients from looking as though they have had incisions. If this patient were a nonsmoker, I would use ultrasound in the abdomen and approach within 1 to 2 cm of the abdominal wall; I think I could get enough skin retraction. If she has an overhang in the penile area she will need a skin resection.

**Dr. Pitman:** I would certainly give this patient the opportunity to lose 30 to 50 pounds before I performed surgery on her, although it is unlikely that she would. However, I would perform liposuction on her regardless of whether she lost weight.

**Dr. DiSpaltro:** In general, do you use liposuction as a method of encouraging patients to diet and exercise, or do you try to get them to diet first and then have liposuction?

**Dr. Pitman:** I do both. Many patients who are overweight show up in the office precisely because they have been frustrated in their attempts to improve their appearance through diet and exercise. They are looking for help beyond what they can do for themselves. I think it misses the point to tell these patients that they must lose weight before a procedure.

Instead, I make my own judgment as to whether or not I can give them a surgical result that I will find cosmetically pleasing. If I believe they will have a good result, I offer them the surgery at their existing weight. All patients who are overweight are, however, counseled to lose weight as a matter of health and aesthetics. It is only good practice, and certainly essential to an informed consent,
that these patients be told that they may be able to achieve significant improvement in their appearance through their own efforts without surgery.

**Dr. DiSpaltro:** Dr. Gingrass, what would be the sequence of events once you had this patient in the operating room? Which areas would you approach first and how would you progress from one area to another?

**Dr. Gingrass:** This patient is an ideal candidate for UAL. I think she needs a circumferential trunk procedure. I would have cringed at treating a patient like this before the advent of UAL, but now I am excited at the prospect of treating someone like this with the use of ultrasound.

In the operating room I would approach the hip roll area first with the patient in the prone position, using a rolled blanket to prop her hips and elevate her buttocks slightly. I would approach the upper back rolls through a bra line incision. I think Dr. Rohrich’s point regarding asymmetrical incisions is excellent. I would approach the posterior hips or iliac crest areas through parasacral incisions and be fairly aggressive in the back. I would then turn the patient to the supine position and address her abdomen through two suprapubic incisions. I would be less aggressive in the abdomen because of her smoking. I would have told her preoperatively that she is definitely going to have hanging skin, but I can reduce her abdominal bulk. If she couldn’t accept that, I would either not operate on her or excise the skin after I counseled her extensively on the implications of her smoking. I probably would also use an upper umbilical incision to approach the epigastric area, where I would be more aggressive than I would be in the lower penlticus. In addition, I would use a drain in the abdomen because I would remove approximately 2 liters of fat from that area, which would put her at high risk for developing a seroma.

**Dr. DiSpaltro:** How would you treat her anterior thighs?

**Dr. Gingrass:** I would treat the medial thighs with SAL alone, suctioning in the intermediate and superficial planes. I would not suction her anterior thighs.

**Dr. DiSpaltro:** I consider this to be a large-volume suction case. Dr. Rohrich, how would you prepare her for this surgery? Would you have her donate her own blood in advance?

**Dr. Rohrich:** I find that I seldom need autologous transfusions now that we are using super wet and tumescent liposuction techniques. The volume of fat to be removed from this patient isn’t large enough for me to consider using autologous blood. The role of proper nutrition and preoperative counseling are key elements. Many aesthetic surgery patients are more responsive to seeing bariatric medicine practitioners preoperatively than they used to be. It is extremely helpful if you can find a physician who will work with you in treating moderately obese patients. This patient has a square, masculine type of contour that can be changed only to a limited degree. Surgery will improve her silhouette, but she needs to understand that it will be only a small part of the triad of diet, exercise, and lifestyle change. Liposuction is only a kick start. I always tell patients that “the result ultimately will be determined by you somewhat through diet and exercise.” If I have two patients, one who changes her lifestyle and one who doesn’t, after 1 year the one who changed her lifestyle, began exercising regularly, and maintained a sensible diet would look dramatically better.

**Dr. Hughes:** Dr. Gingrass’ comments regarding the importance of being aggressive in the upper abdomen were excellent. I have found that I can obtain a surprising amount of upward pull in the long-term result by suctioning very aggressively in the upper abdomen. I have had patients whom I virtually guaranteed would have hanging skin, but they did not want any type of resectional excision. I found, to my surprise, that if I suctioned very aggressively in the upper abdomen it often produced an upward pull on the lower or mid abdomen.

**Dr. Rohrich:** How do you define aggressive?

**Dr. Hughes:** In this patient I would use UAL in the deep plane of the upper abdomen. If she were willing to accept that 8 mm incision in the periumbilical area, I would suction fairly aggressively with SAL using a 3 mm cannula in the intermediate plane and then suction superficially using a 2 to 2.5 mm cannula—that is, if she were a nonsmoker.

**Dr. Gingrass:** I might add inframammary incisions if I needed them. You can make the umbilical incision up inside the hood and hide it completely.

**Dr. Pitman:** I agree with Dr. Gingrass’ and Dr. Hughes’ comments concerning the upper
abdomen. In general, most women have more voluminous fat stores below the umbilicus, and surgeons tend to concentrate their efforts in this area. If, however, the lower abdomen is suctioned aggressively and the upper abdomen is suctioned very little or not at all, the patient ends up with a disharmoniously flat lower abdomen and bulging upper abdomen. This disharmony is a frequent source of requests for secondary surgery that can be avoided if the surgeon consciously addresses the upper and lower abdomens at the initial consultation and surgery.

Dr. DiSpaltro: Is there anything else that you would like to add regarding the postoperative management of this patient?

Dr. Gingrass: I would instruct this patient to use a compression garment and probably binders because she has a very difficult body to fit. However, I believe that binders are a double-edged sword because they move up and down. I would instruct the patient to start using an all-in-one garment 5 days after the surgery.

Dr. Rohrich: I would be very careful about the type of compression garment I used for this patient because she is a smoker, and I would be especially careful if I were performing moderately aggressive liposuction.

Dr. Hughes: I would use a garment just as Dr. Gingrass described earlier, and I agree that binders should be used early in the postoperative period.

Dr. DiSpaltro: When you say early, what do you mean specifically?

Dr. Hughes: Patients should wear binders in the first 5 to 6 days. I use a one-piece binder as opposed to the multiple-panel binders, which are associated with more creasing problems.

Dr. Rohrich: I usually see patients about 3 days after surgery; however, I would want to see this patient after the first day to see whether the garment was slipping or causing skin friction problems.