

# Mesotherapy

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Mesotherapy is gaining popularity as an easy means of fat removal and body sculpting. Concerns centering on the safety and efficacy of mesotherapy are valid, and scientific data are lacking. As with any new technology, it is important to assess the benefits, safety, experience, and standardization of mesotherapy.

Mesotherapy was originally developed in France to treat myriad noncosmetic disorders. The name is derived from the area in which the treatment is administered (ie, the *mesoderm*, an embryologic term). Mesotherapy is an injection technique, not a treatment for a specific disorder. It is a generic term, like *intramuscular* or *subcutaneous*. Proponents of mesotherapy use the technique to treat everything from tinnitus and pain (its original indications) to vascular and musculoskeletal diseases, localized adiposity, hair loss, and facial aging.<sup>1-4</sup> Because there are no controlled, double-blind studies to show efficacy of one technique or drug regimen over another, protocols for mesotherapy cocktails are at the discretion of the practitioner and may include a variety of prescription and nonprescription drugs, herbs, vitamins, hormones,  $\beta$ -agonists, cyclic adenosine monophosphate inhibitors, or emulsifying agents.

Mesotherapy can be administered with a small-gauge needle via manual injections or with an automated injection gun using a serial puncture technique. Placement levels of mesotherapy solutions vary and include intradermal (both superficial and deep) and subcutaneous. The area of placement addresses a particular target. Intradermal injections target collagen and hyaluronidase production, adnexal structures, and hormone receptors. Subcutaneous injections target mostly adipose tissue and joint capsules.

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## MESOTHERAPY CONCERNS

There are no studies in the medical literature that support the use of mesotherapy for any indication. In the 1980s, a small study looking at thigh girth in obese women before and after subcutaneous injections of isoproterenol into one thigh showed a decrease in girth as compared with the control thigh, which received a placebo injection. The authors noted, however, that the most significant results were seen in study subjects who were also losing weight.<sup>5</sup> Isoproterenol is an antiarrhythmic drug that is part of the intervention sequence in the algorithm of bradycardia as determined by the American Heart Association. There is no precedent of safety for the injection of this drug into the subcutaneous compartment. As with many of the US Food and Drug Administration (FDA)-approved drugs in mesotherapy cocktails, isoproterenol is an FDA-approved drug that is being used out of context. Using drugs (or even vitamins) in a manner for which they are not intended raises safety and efficacy concerns.

## SPECIFIC CONCERNS

One concern is that many drugs in the mesotherapy cocktails are oral or topical medications, vitamins, or herbs that are found in a nonsterilized form. To inject these substances subcutaneously, they must be sterilized by an independent source, most often a compounding pharmacy. Are these substances truly sterile? Does heat sterilization inactivate any of these substances or lead to new substances with carcinogenic or toxic potential? Companies that follow strict Good Manufacturing Practice sterilization guidelines are the only ones qualified to make drugs.

Using lidocaine as an example, the data that were generated over many years in the dermatology literature to assess safety of tumescent anesthesia are the gold standard. Studies



Contour irregularities from the injection of unknown mesotherapy solution.

need to be done on each component of a mesotherapy solution, with peak blood levels documented and, where applicable, a maximum or milligram-per-kilogram dose assigned. An additional concern regarding mesotherapy is the fact that some drugs in mesotherapy cocktails are lipid soluble whereas others are not. Which law of pharmacokinetics applies to which drug? Do combinations of drugs intended for solo use, herbs, and vitamins interact with one another and negate or potentiate each other's effects? Does parenteral administration of any of the substances in the mesotherapy cocktail interact with medications the patient may be taking on a regular basis? Is a drug or vitamin that is intended for oral use still safe when placed in the subcutaneous compartment and subject to different pharmacodynamics?

### MESOTHERAPY COMPLICATIONS

There are a small number of reports of mesotherapy complications in the medical literature, and most of these reports come from Europe. Among the complications associated with mesotherapy are atypical mycobacterial infections, Köbnerization, irregular contours, urticarial and lichenoid reactions, and skin atrophy and necrosis (Figure).<sup>6-10</sup> However, the author notes that necrosis and contour irregularities are being seen more frequently with the increasing popularity of mesotherapy and urges the practitioners treating these complications to write them up as case reports.

### MESOTHERAPY FOR BODY CONTOURING

Mesotherapy is not always lipotherapy. Lipotherapy, or the dissolution of fat for cosmetic purposes, is performed via mesotherapy. Lipostabil® is the commercially available combination of deoxycholate and phosphatidylcholine. Phosphatidylcholine induces lipolysis and may lower blood triglyceride levels when ingested orally. Deoxycholate increases the solubility of phosphatidylcholine. Recent data suggest that the lipolytic effects of Lipostabil, when administered via mesotherapy, result from the detergent properties of deoxycholate.<sup>11</sup> One open-label, small

clinical trial has been conducted to evaluate the efficacy and safety of phosphatidylcholine in treating suborbital fat over a 9-month period. In this study, multiple injection sessions were needed. Edema and erythema lasted no more than 3 days and were observed in 70% and 90% of the patients, respectively. Most patients expressed satisfaction with the results; however, 50% showed recurrence of the suborbital fat at the 9-month follow-up visit.<sup>12</sup> The injectable combination of deoxycholate and phosphatidylcholine is not approved by the FDA. In fact, there are no FDA-approved injectable agents for body contouring or fat removal.

### CONCLUSION

Mesotherapy is a method of delivering a single drug or drug cocktails. There is no information on the safety or efficacy of mesotherapy in the medical literature; therefore, mesotherapy should at this point be considered an experimental procedure. Mesotherapy for fat removal using a combination of deoxycholate and phosphatidylcholine shows promise as a lipolytic agent but is currently not approved or being studied by the FDA. Dermatologic surgeons should be proud of their heritage as the innovators in tumescent liposuction. Until proven otherwise, this is the only safe fat-removal technique currently available.

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