Injection lipolysis using synthetically produced Deoxycholic Acid (DCA) is a minimally invasive technique recently FDA-approved to treat subcutaneous fat in the submental area by injecting the cytolytic drug into superficial adipose tissue. This technique can also be an excellent therapeutic approach for nonsurgically reducing stubborn, excess fat localized in the lower abdominal area, often unresponsive to diet and exercise, for carefully selected thin, healthy patients, usually with a body mass index (BMI) <25 kg/m².

DCA is an endogenous bile acid that facilitates intestinal absorption of fats; its synthetic formulation, DCA injection (ATX-101; Kybella [United States], Belkyra [Canada]; Allergan) can be used for injection lipolysis. DCA injection (10mg/cc sterile solution) is supplied in 2cc vials for single patient use for administration by subcutaneous route. When injected into tissues, DCA destroys cell membranes causing selective fat cell lysis, because it has a higher affinity for adipose cell membranes than other tissue cell membranes. Previous Phase 3 randomized controlled trials have demonstrated the efficacy and safety of DCA injections in the submental fat. Presently, it is approved for improvement in the appearance of moderate to severe convexity or fullness associated with submental fat in adults.

Results of an open-label Phase 1 study (NCT01319916) of 10 subjects showed that DCA injection in subcutaneous abdominal fat is safe and well tolerated; adverse events in this study were mild in severity, transient, and limited to the treated area. Detailed results of Phase 1 studies (NCT01462786, NCT00835952, NCT01632917) for the use of DCA in subcutaneous abdominal fat are pending. Here we photographically demonstrate the first successful clinical treatment of abdominal fat with DCA injections in the American medical literature.

**CASE REPORT**

A 27-year-old physically fit, healthy Caucasian female with a BMI of 21.6 kg/m² presented for a nonsurgical treatment of her lower abdominal fat. She reported similar traits in both parents. General examination was normal. Local examination revealed mild excess fat in the lower abdominal region (Figures 1A, 2A). There was no evidence of infection or inflammation in the treatment area. The patient was seeking rapid treatment for improvement of appearance before her upcoming wedding and would only undergo a nonsurgical option. The procedure and possible side effects of DCA injection lipolysis were explained and off-label consent was obtained.

Based on initial assessment and our experience with DCA, we proposed an extremely conservative approach, injecting two treatment sessions with 2cc DCA in each session. However, since the patient vastly preferred a more rapid improvement in the appearance of her abdomen, a single treatment session utilizing 4cc DCA was performed. With the patient in a sitting position, a total of 4cc DCA was injected into the subcutaneous lower abdominal fat with a 32-gauge needle held perpendicular to the skin. Injections of 0.15cc DCA each were distributed with injections spaced 0.5–1.0cm apart, covering the treatment area. Appropriate care was taken not to inject DCA intradermally or into the underlying muscle. Ice packs were applied to the treatment area five minutes before and after the procedure to minimize pain. The patient was kept under observation at our office for 30 minutes. She experienced moderate tenderness in
As the treatment for this case report was conducted early in our aesthetic DCA body-contouring experience, the dosing for this patient was extremely conservative, although more than we were commonly injecting at the time in a single site in a single treatment session. Nevertheless, satisfactory results were achieved. In our opinion, higher dosing strategies over two or more treatment sessions may be necessary to treat lower abdominal subcutaneous fat, even in thin and fit patients. We have seen higher dosing strategies become increasingly effective in our practice in the months since we treated this patient.

To ensure patient safety, DCA injection should only be administered by physicians with a thorough understanding of the relevant anatomy, skin thickness, and procedure details (for example, the use of short needles, pinching the abdominal fat layer away from the underlying muscle fascia, administering all injections at the same depth and angling the needle towards subcutaneous fat rather than skin). With careful patient selection and appropriate technique, excellent outcomes can be expected, as we observed in this case report. To our knowledge, this is the first report of off-label DCA use to treat stubborn lower abdominal fat.

CONCLUSION
A single session of DCA lipolysis can effectively reduce lower abdominal fat and even mild abdominal protuberance in thin patients. This minimally invasive technique is safe and well tolerated. Large-scale randomized controlled trials comparing DCA injection with other treatment modalities are needed to validate the positive results of this first report on the use of DCA for treating stubborn abdominal fat.

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DISCUSSION
The lower abdomen tends to accumulate stubborn fat that is highly resistant to diet and exercise, even in physically fit and thin people. Nonsurgical treatment of lower abdominal fat also represents an unmet need for women who have otherwise lost all other excess weight gained during pregnancy. In many other thin aesthetic patient cohorts, this area often remains stubbornly resistant in the face of even significant weight loss. Such localized fat deposits in thin individuals are challenging to treat and may only decrease in size in conjunction with extreme physiologic stressors, such as anorexia nervosa, cancer, or malnutrition-related disease.

Injection lipolysis using DCA could be a suitable and safe method for flattening a protruding lower abdomen in healthy individuals. This case report demonstrates the successful treatment of lower abdominal fat with DCA in carefully selected thin patients. Indeed, individuals with a BMI <25 kg/m² are the best candidates for DCA injections in the lower abdomen.

the treatment area that subsided within 10 minutes, as well as a mild/moderate increase in lower abdominal swelling and a mild deep itching sensation that lasted four to five days. The area was only tender to deep palpation for 10 days. Our patient did not experience any marked post-procedural erythema or bruising. Resolution of lower abdominal protuberance in the treatment area was observed at six weeks post-procedure. The patient was highly satisfied with the treatment outcome (Figures 1B, 2B).

CONCLUSION
A single session of DCA lipolysis can effectively reduce lower abdominal fat and even mild abdominal protuberance in thin patients. This minimally invasive technique is safe and well tolerated. Large-scale randomized controlled trials comparing DCA injection with other treatment modalities are needed to validate the positive results of this first report on the use of DCA for treating stubborn abdominal fat.