Comparison of Deoxycholic Acid vs. Liposuction for Submental Fat Reduction

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Background & Purpose

Cosmetic procedures and enhancements have become newly popular within the past decade due to the increased use of social media and medical-spa centers opening. Among the new age of achieving fullness with fillers and prevention of wrinkles with Botox, is the desire to reduce excess submental fat. Modern techniques have hit the aesthetic industry which include recently FDA approved deoxycholic acid injections. Deoxycholic acid is a bile acid naturally produced in the small intestine and stored in the gallbladder. Its function is to emulsify lipids, and when injected directly into adipose tissue, it creates an inflammatory response within the immune system in which reduces submandibular fat.[1] Dermatologists and plastic surgeons are now able to offer patients other non-invasive options when compared to traditional liposuction.
The overall goal is to evaluate patient satisfaction, efficacy, and safety of submental fat reduction methods.

PICOT

In adults over the age of 18, how does traditional liposuction compare to deoxycholic acid injections for the reduction of submental fat over the course of treatment?

Design & Methods

Keywords: submental fat, submental adipose, deoxycholic acid, kybella, ATX-101, liposuction, submental liposuction, reduction, patient satisfaction, cost

Inclusion: age 18+, undesired submental fat, studies in English, full text, published no earlier than 2015

Exclusion: BMI over 40+, excessive skin laxity, previous neck trauma or treatments, limited full text, studies in other languages, published before 2015

Summary of Evidence Search

Online databases used were PubMed, ScienceDirect, and Google Scholar. After applying the keywords for deoxycholic acid, 369 results returned, and 3940 results returned for liposuction. However, the results were significantly refined after applying the inclusion and exclusion criteria. No articles were found that met the inclusion criteria for liposuction, so the search was expanded to the most recent data available, which resulted in the inclusion of one article from 1992.

After applying the criteria, five studies were selected including: two randomized controlled trials, a systemic review, and a retrospective and prospective cohort study.

Results

Studies involving Deoxycholic Acid:

- **Patient satisfaction:** upward trend in psychological impact.
- **Treatments:** 4-6 sessions.
- **Endpoints:** assessed using both patient and clinician reported scales, demonstrating reduction of submental fat when compared to placebo injections.
- **Adverse effects:** localized to the site of injection, including pain, swelling, numbness, and bruising. [2]
- **Recovery time:** 1-4 weeks per treatment.
- **Cost:** Average charge of $690 per vial, resulting in approximately $6500 per patient for 3 treatment sessions. [7]

Studies involving Liposuction:

- **Patient satisfaction:** upward trend in appearance and impact.
- **Treatments:** 1 session/procedure.
- **Endpoints:** assessed using pre/post operative photographs and patient satisfaction surveys, demonstrating reduction of submental fat.
  - 5 -point scale: 1: poor – 5: excellent, 86.6% rated resulted as “excellent”.[5]
- **Adverse effects:** edema (0.83%), hematoma (0.49%), infection (0.15%), permanent irregularity (0.98%). [6]
- **Recovery time:** Approximately 4 weeks.
- **Cost:** Varies with provider, $3000-$6000 USD. [7]

Table 1. Outcome measures of Deoxycholic Acid

Deoxycholic Acid	Patients with >/= 1-point improvement at 3 months		
	CR-SMFRS	PR-SMFRS	Risk of Fibrosis
1mg/cm2	58.30%[2]	64.90%[3]	
	RR 2.06 (1.37-3.11)[4]		OR 10.04 (3.64-27.68)[4]
2mg/cm2	62.60%[2]	67.30%[3]	
	RR 5.30 (3.85-7.30)[4]		OR 9.74 (6.08-15.61)[4]
Placebo	34.50%[2]	44.10%[3]	
	1 pt improvement	2 pt improvement	
Deoxycholic Acid	66.50%[3]	18.60%[3]	
Placebo	22.20%[3]	3.00%[3]	

CR-SMFRS: Clinician Rated Submental Fat Rating Scale, range (0-4), 0: absent- 4: extreme
PR-SMFRS: Patient Rated Submental Fat Rating Scale, range (0-6), 0: extremely dissatisfied- 6: extremely satisfied

Discussion

Submental fat reduction can be achieved using both high or low dose injections of deoxycholic acid, in which stronger concentrations do not equate to more reduction. Although, stronger concentrations may result in more side effects. Liposuction remains a tried-and-true method offering significant results of submental fat reduction within one treatment. Adverse effects for both procedures include pain, edema, and numbness within the submandibular area. Uncommon and temporary side effects include paresthesia to the facial nerve.

Limitations

Currently, there are no studies published with a direct head-to- head comparison of each method. There are also no standard scales of measurement for both psychological impact and fat reduction. In addition, updated research on the safety and efficacy of liposuction is necessary.

Conclusion

Both deoxycholic acid injections and liposuction are effective and safe procedures to perform. Choosing a treatment is dependent upon patient demographic, BMI, and overall treatment goal. However, if one procedure were to be chosen, liposuction may be preferred due to deoxycholic acid possibly resulting in higher cost and longer downtime from the number of sessions that may be required.

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