LipoAI Gynecomastia: A Closed and Scarless Option with Other Advantages

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Grade 2-3 | 3 mos post-op | Courtesy of Dr. Gregory Albert

Background

The prevalence of gynecomastia ranges from 38 to 64 percent in the male population (Innocenti 2022) and was the number one elective surgical procedure in men in 2022 according to the Aesthetic Plastic Surgery National Databank Statistics. 22,467 men had gynecomastia surgery in 2021, up 66% from the previous year[1]. There are three main techniques for addressing the three different types of gynecomastia (pseudo, mixed, and true gynecomastia). They include suction-assisted with or without the use of energy-based laser or ultrasound devices, excisional surgery alone, or a combination of suction and excisional. There has been a dramatic increase in the use of Energy Based Devices (EBDs) to navigate the dense tissue in gynecomastia; however, the subglandular dense Nipple Areolar Complex (NAC) tissue often requires surgical excision with an average of 7cm for the glandular tissue removal[2]. In larger patients and Simon III cases, additional tissue retraction is needed, otherwise a direct skin excision may be needed. As early as 2007, laser lipolysis has been used with success as it can affect both fat and glandular stromal tissue as well as septal band contraction as a response to energy delivered subcutaneously or subdermal skin heating and contraction[3].

Hypothesis

With the introduction of LipoAI*, the latest generation of laser-assisted liposuction that incorporates Artificial Intelligence, gynecomastia may be done faster, more efficiently, and very safely, and in some cases, without the need for a direct excision or additional external or internal skin tightening devices.

There are multiple studies that discuss the benefits of using lasers in gynecomastia and why laser lipolysis is a key technology for this procedure. Laser lipolysis utilizes the principles of selective photothermolysis to preferentially lyse adipocytes. Different laser wavelengths may vary in their relative effectiveness in targeting substances present in the subcutaneous environment. Thus, lasers achieve their desired effect via photolysis of adipose cells, photocoagulation of small vessels, liberation of adipocyte lipases, and contraction of dermal collagen[4]. Immediate and secondary tissue tightening effects may also be realized in the treatment areas. Other studies discuss a less traumatic removal of tissue, smaller and less noticeable entry scars, less risk for infection and overall adverse events benefitting the patient in both overall results and post-treatment recovery[5]. The end results for the patient are more consistent outcomes and potentially less pain post-operatively. Contour deformities, seromas, lipomas, and asymmetry all decreased in occurrence over the past 18 years as a result of laser technology [6-7].

The Science behind LipoAI for Gynecomastia

There are four major advancements in LipoAI over traditional liposuction. First, it utilizes a unique 1444nm wavelength. While there are many available wavelengths, only the 1444nm reaches both the highest peak water and fat absorption. When comparing to other systems, such as 1064nm, 1320nm, or 980nm, the 1444nm wavelength possesses a higher absorption coefficient of all major chromophores being targeted in this procedure[8]. Additionally, having both high fat and water absorption allows the operator to simultaneously target and rupture adipocytes as well as tighten the surrounding tissue and overlying skin. Similar energy-based liposuction technologies, such as ultrasound, radio frequency, or plasma systems need to work in conjunction to achieve the same affect; in other words, a minimum of two systems are needed to create the same effect as LipoAI alone.

Second, LipoAI's extremely high peak power not only creates less thermal wake (unintended overtreatment of surrounding tissue), but it also effectively concentrates the energy to the intended treatment area, making it safer, faster, and quite literally, laser-focused. Third, the "byproduct" of laser lipolysis is heat which helps stimulate collagen for a long-term tightening effect as well as a short-term effect of dermal retraction that can be visualized by the immediate contraction of the nipple areolar complex. Finally, the "Artificial Intelligence" in LipoAI utilizes a sophisticated, patent-pending algorithm to deliver the appropriate amount of energy in real-time by adapting to the surgeon's movement and the patient's tissue resistance as it heats and breaks down soft tissue. This enables both a high safety profile and a more consistent delivery of energy throughout the entire procedure.

LipoAI Gynecomastia Technique

Anesthesia is administered based on the surgeon's preferred method. A 1-2cm incision is made in the peri-areolar region and/or laterally in the axillary crease depending on the size of the breast and surgeon's preference. The treatment area is infiltrated with lidocaine/epinephrine-based tumescent fluid. After infiltration, the LipoAI fiber encased in a stainless-steel sheath is introduced through a small 1-2mm incision.

A traditional fanning method is used, typically progressing from deep to superficial, to break up the adipose tissue and fibrous tissue. The endpoint is reached when both the recommended dose of energy and loss of resistance is achieved. The laser is then focused on the glandular tissue and under the NAC. The inframammary fold (IMF) is also disrupted using the laser. Once dose, loss of resistance, and desired contour endpoints are reached, standard liposuction aspiration is performed. A smaller 3.0mm cannula may be used as the tissue has been pretreated and is easily aspirated through smaller diameter cannulas. This allows for a less traumatic removal of tissue. Additionally, the remaining glandular tissue is reduced and thus much easier to excise, when necessary.

Surgeons' Experience

Dr. Bengtson historically utilized a traditional suction and excision technique. While he has utilized laser liposuction systems in the past in over 1000 patients, it added significant time to the procedure and the amount of energy delivered was difficult to determine. He believes he undertreated most patients because he did not want to overtreat or create a complication. He reports being much more confident in the new LipoAI system as being more efficient and accurate in its energy delivery.

Dr. Bengtson has used his new LipoAI system in 55 patients and generally approaches through a lateral breast axillary incision. LipoAI easily disrupts the inframammary fold region and allows for the feathering of the fibrous tissue. *"It adds about six minutes per area, but I gain time in the evacuation phase significantly with about 1/3 to 1/4 of the total aspirate volume vs standard liposuction. Although difficult to quantify, there is significant contraction of the skin and soft tissues versus standard liposuction where the skin just collapses around the evacuated fat. I have also performed fewer secondary skin resections in the breast."*

Grade 3 | 2 mos post-op | Courtesy of Dr. Gregory Albert

Before using LipoAI, Dr. Albert only treated gynecomastia patients with ultrasound or power-assisted liposuction in combination with excisional surgery. His transition to LipoAI was out of the need for better results and treating patients more optimally with only a few small incisions. As patients have developed more severe gynecomastia, and now with transgender breast reductions, there really is a need to remove more of the glandular tissue through small incisions. With LipoAI, Dr. Albert treats patients with very dense breast tissue through a small incision from about 3 to 9 o'clock on the areolar margin. On occasion, he will add an incision in the axilla or even the midline in the upper abdomen, at only 2mm, which does not require a suture.

"I have been very impressed with the early outcomes in my gynecomastia Simon grade I and II patients. LipoAI is much more efficient than standard or power-assisted liposuction, and I rarely need a subareolar excision, just the 1-2mm incision for the LipoAI cannula. For Simon grade III, I can reduce the size of the glandular tissue resection enough with LipoAI and reduce the subareolar incision size and surgical resection space. More importantly, when removing that much glandular tissue, the skin has significantly more contraction [with LipoAI] reducing the need for skin excision and visible scarring."

- Dr. Bradley Bengtson

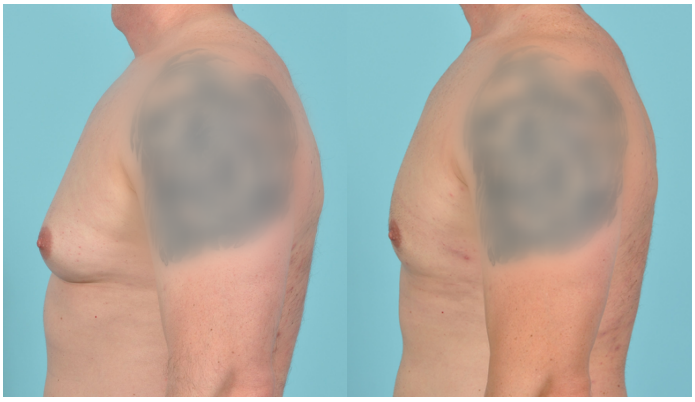
The laser safely separates the glandular tissue from the dermis, the muscle, and other tissues in a very bloodless fashion. *"With the precision of the laser, I can very accurately and safely remove all of the intended breast tissue without worrying about residual tissue or irregular results. Furthermore, I can leave a very accurate amount of tissue below the NAC to avoid a saucer deformity. The skin contracts nicely, and with the energy in AI Mode, it is very safe close to the skin thus avoiding skin damage."* Since the breast tissue can be removed very quickly after the LipoAI application, it limits surgeon fatigue and is much safer than "jabbing" sharp cannulas in attempt to break up the glandular tissue for removal which, in most cases, would've required a large/direct excision. *"My patients have enjoyed an even better experience with LipoAI removal. In the past, there was a need for drains with larger patients, but moving to the LipoAI device, I have not put in one drain."*.

Grade 3 | 6 mos post-op | Courtesy of Dr. Gregory Albert

Discussion

Liposuction provides a significant improvement to excisional breast surgery alone. However, larger skin incisions and surgical dissection are required, along with longer recovery times and potential adverse events. Postoperatively, the patient may also experience a high degree of pain as well as redundant, loose skin, especially in larger breasts or weight-loss patients.

With the initial introduction of lasers into liposuction, there were some learning curves with the technology and techniques; however, most can agree that significantly less force is required to remove tissue in addition to increased tissue contraction. Due the tissue selectivity of laser lipolysis and the wavelength absorption properties, the laser can also coagulate or cauterize blood vessels resulting in less bleeding and bruising; in addition to effectively targeting water and fat and avoiding other structural components. Thus, the majority of the septal fibers connecting the fascia to the muscle remain intact and further contract skin to tighten these bundles of collagen . With these benefits, the application would seem extremely beneficial in treating gynecomastia.[9]



Grade 2 | 1 mo post-op | Courtesy of Dr. Bradley Bengtson

LipoAI is reintroducing laser energy as an even more efficient method than previous laser lipolysis or other traditional methods in treating gynecomastia. With the artificial intelligence to predict in real-time the most efficient amount of energy being delivered in combination with higher peak power, the energy is delivered more safely and with more precision. LipoAI may also more effectively treat the dense glandular tissue directly underneath the NAC, allowing for a higher percentage of scarless, excision-free procedures. It may also lead to shrinking of the NAC thus avoiding a mastopexy in some cases. For higher Simon grades, a much smaller excision of breast parenchyma with better overall skin contraction may be achieved.

Summary

The introduction of LipoAI is creating more options with significant benefits for standard fat reduction, skin tightening, treating dense and fibrous tissue and previously treated areas and, in this report in particular, gynecomastia. Specifically in patients with lower Simon Grades, the potential to avoid a direct skin excision to eliminate the glandular tissue and reduce the NAC is a significant advantage. Through continued innovation and technology, and with early results, LipoAI appears to be reducing adverse events and improving surgeon and patient outcomes.

*LipoAI is a laser lipolysis device driven by artificial intelligence and indicated for surgical incision, excision, vaporization, ablation, and coagulation of soft tissue. All soft tissue is included, such as skin, cutaneous tissue, subcutaneous tissue, striated and smooth tissue, muscle, cartilage meniscus, mucous membrane, lymph vessels and nodes, organs and glands. The LipoAI is further indicated for laser assisted lipolysis.

LipoAI

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