Chapter 7
VASER-Assisted Liposuction of Gynecomastia

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Gynecomastia is a condition where the glandular tissue of the male breast undergoes benign proliferation resulting in visible breast enlargement. There are a number of etiologies reported in the literature [1–3] such as liver cirrhosis, hypogonadism, tumors of the testicles, kidney disease, and certain drugs; however the majority of the cases are idiopathic, both in adults and postpubertal adolescents. There is still significant controversy among authors regarding the incidence of the condition based on the wide margins reported in the literature. A prevalence of 32–65% has been reported in adult males [4, 5] and a range of 4–69% has been reported in adolescents [6, 7]. Surgery for correction of gynecomastia is currently ranked as the third most common aesthetic surgical procedure in men with over 20,000 cases reported by board certified plastic surgeons in 2017 [8, 9].

There are numerous surgical approaches for the correction of gynecomastia reported in the literature. In the past 20 years, several techniques involving liposuction in combination with glandular resection through minimal, well-concealed incisions have become popular due to their consistently good aesthetic outcomes and a lack of postoperative surgical stigmata. In 1994, Rosenberg [10] published good results treating gynecomastia with only liposuction using an aggressive tip cannula that reportedly also removed glandular tissue. Morselli [11] described a technique that involved traditional suction-assisted lipectomy (SAL) combined with a pull-through technique for gland removal. Several years later Bracaglia [12] published his experience with a similar technique and reported good, consistent results. Hammond et al. [13] modified the previously reported pull-through techniques using ultrasound-assisted liposuction (UAL), with good results, and Ramon et al. [14] introduced the concept of endoscopic visualization to these techniques in 2005. A few years later Lista and Ahmad [15] reported on a similar pull-through technique but this time employing power-assisted liposuction (PAL). Currently the author employs a similar technique using VASER-assisted liposuction (VAL) for the fat extraction.

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Preoperative Considerations

Since the majority of patients who present for evaluation of gynecomastia have either idiopathic adult gynecomastia or the postpubertal idiopathic variety, an extensive hormonal workup is not recommended unless there is a high index of suspicion about an underlying anomaly or other contributing factors such as drugs. Recently, Malhotra et al. [16] reported on a series of 197 patients and concluded that routine endocrinology workups were of little value and that patients with gynecomastia that persisted beyond 16 years of age should undergo surgery as the primary method of treatment. A detailed history and physical along with typical presurgical laboratory studies usually is sufficient preoperative workup in most of these cases. Further diagnostic tests such as hormonal studies, gene karyotyping, or imaging studies should only be reserved for patients where abnormalities are found during their routine preoperative screening. Rohrich et al. [17] reported on the management of gynecomastia and published an algorithm for its evaluation and treatment.

Gynecomastia occasionally presents unilaterally and, in these cases, one should rule out the rare occurrence of male breast cancer. Cancer of the male breast accounts for approximately 1% of all breast cancers and usually presents unilaterally as a firm nodule anywhere on the breast, not necessarily under the nipple-areolar complex. It is associated with high estrogen use, cryptorchidism, Klinefelter syndrome, post-orchiectomy, or exposure to radiation. Although it has been reported at practically all ages, the mean age for male breast cancer is 65 and it has been linked to BRCA1 and BRCA2 genes [18]. Clinical signs can include nipple retraction with or without bloody nipple discharge and skin dimpling. Patients at high risk or with signs related to male breast cancer should undergo mammography which can differentiate malignant from benign masses in the male breast with over 90% sensitivity [19].

Preoperative photography is performed in the anterior, right and left oblique, and right and left lateral views (Fig. 7.1a–e). Preoperative markings are performed in the standing position and extend beyond the anatomical boundaries of the breast to include all lipodystrophy areas involving the chest (Fig. 7.2). It is of paramount importance to also extend inferiorly beyond the inframammary fold into the upper abdomen and to properly disrupt a well-defined inframammary fold.

Surgical Technique

The author typically performs the procedure under general anesthesia. Access incisions extend 3–4 mm and are created with a #15 blade at the lateral inframammary fold and the inferior areolar border. The author's wetting solution formula for general anesthesia cases is composed of 1 ml of epinephrine 1:1000 in a liter of Ringer's lactate solution at room temperature. Infiltration of the wetting solution is performed using a power infusion pump at a rate of 300 ml per minute with even distribution

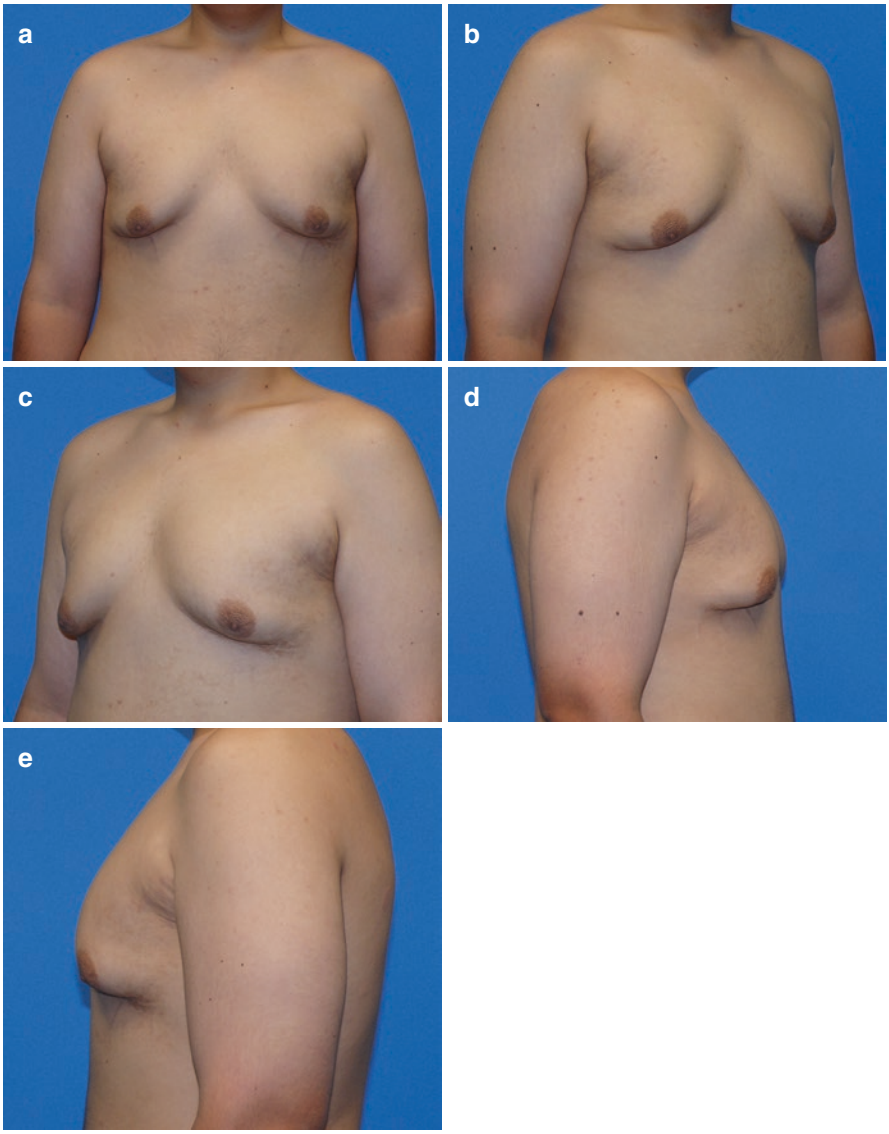

Fig. 7.1 (**a–e**) Preoperative photography for gynecomastia includes anterior view, right and left oblique views, and right and left lateral views

throughout the breast and chest areas to be addressed. Infusion is continued to the point of tumescence including the subdermal space (typically 700–900 ml per side). Although there are "bullet ultrasonic probes" designed specifically for gynecomastia, the author finds that these probes along with the one-ring VASER probe are too aggressive and not really necessary to treat the typical gynecomastia. I employ a two-ring VASER probe (Solta Medical, Bothell, WA) at 80–90% energy level in

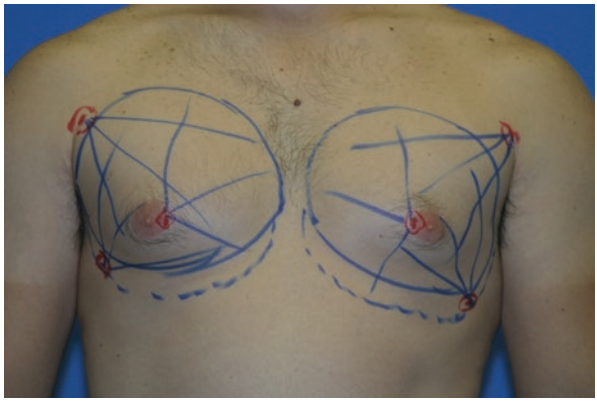

Fig. 7.2 Typical preoperative markings for gynecomastia

continuous mode. The VASER exposure time is 1 minute for every 100 ml of expected total aspirate from the site (typical VASER times are 3–4 minutes per side). Aspiration is performed with 3.7 mm VentX (Solta Medical, Bothell, WA) cannulas for de-bulking and a 3 mm VentX cannula superficially. The pull-through technique for the removal of the fibro-glandular tissue is performed through the access incisions. There are a number of grasping forceps or clamps that have been described as useful for removal of gynecomastia tissue using the pull-through technique. I find tendon forceps work well in most cases and I avoid the use of sharp cannulas such as the Toledo forked cannulas because I find them too traumatic and associated with more postoperative ecchymosis. I do not hesitate to use a small curved, blunt scissor to cut some of the fibro-glandular tissue that does not readily pull through. Bleeding has not been an issue due to the significant hydrostatic pressure from the high-volume tumescence and the epinephrine effect on the tissues. Postoperative dressings include TopiFoam and a compression vest (Fig. 7.3). The surgery is performed as an outpatient procedure and patients are seen for their first visit on the third postoperative day. Depending on the volume extracted, the compression garment is worn between 1 and 2 months. Patients usually return to work after 5 days and avoid strenuous exercise for the first month.

Complications

During the informed consent process patients are advised of the possibility of postoperative hematoma, infection, visible scarring, nipple-areola depression deformity, contour irregularities, skin burns, and sensory changes to the nipples or breast skin. In reality complications are quite rare with this technique and the use of high amounts of epinephrine containing wetting solutions at room temperature has had a tremendous impact on avoiding the excessive bleeding and hematomas associated with the open techniques for treating gynecomastia.

Fig. 7.3 Compression garment used postoperatively following gynecomastia surgery

Surgical Outcomes

A 26-year-old male with persistent idiopathic bilateral gynecomastia was seen in consultation. VASER-assisted liposuction with resection of the subareolar fibroglandular tissue with a pull-through technique was recommended. The surgery was performed under general anesthesia as an outpatient procedure. Wetting solution consisting of 1 ml of epinephrine 1:1000 in a liter of Ringer's lactate solution at room temperature was infused at 300 ml per minute to a total of 750 ml per side. Ultrasound was delivered by means of a 3.7 mm, two-ring, VASER probe at 80% energy level in continuous mode for 3 minutes per breast. Aspiration was performed with a 3.7 mm VentX cannula for the deep tissue and a 3 mm VentX cannula for the superficial, subdermal liposuction. The supernatant fat aspirate volume consisted of 175 ml from each breast. Following the aspiration of the fatty tissues, the fibroglandular component was resected via the pull-through technique. Surgical outcomes at 6 months are depicted in Fig. 7.4a–f. The subareolar glandular tissue and VASER fat aspirate are depicted in Fig. 7.4g, h.

A 44-year-old, healthy, male patient with longstanding history of asymptomatic gynecomastia was seen in consultation requesting aesthetic improvement of his chest contour. VASER-assisted resection of gynecomastia was recommended. The surgery was performed under general anesthesia as an outpatient procedure. The author's wetting solution formula for general anesthesia was infused at 300 ml per

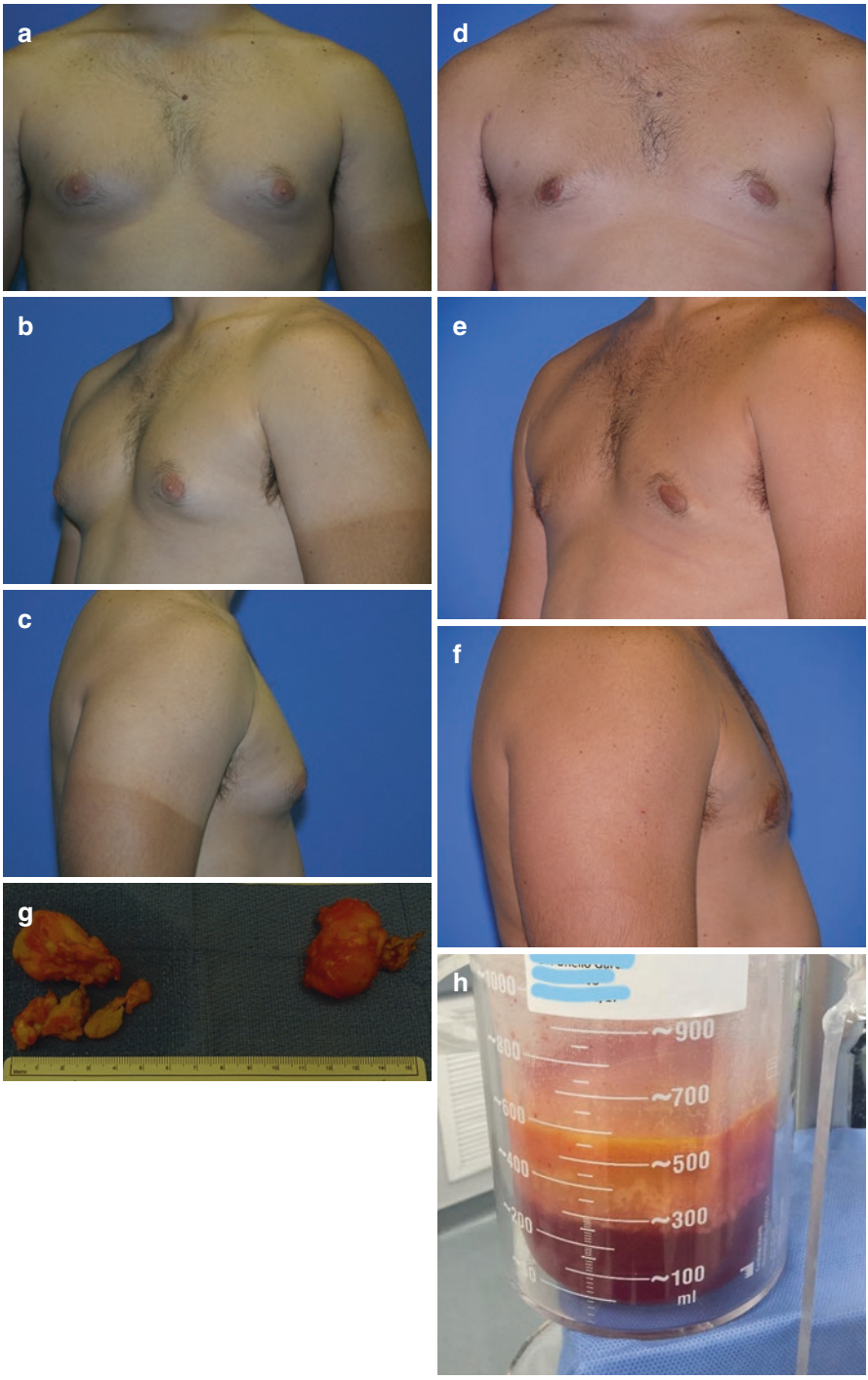

Fig. 7.4 (**a**–**f**) Surgical outcomes at 6 months of 26-year-old male post-VASER-assisted resection of bilateral gynecomastia. (**g**, **h**) Surgical specimen of fibro-glandular tissue and VASER aspirate

minute to a total of 800 ml per breast. A 3.7 mm, two-ring, VASER probe was employed at 90% energy level, in continuous mode for 4 minutes per breast. Aspiration was performed with a 3.7 mm VentX cannula for the deep tissue and a 3 mm VentX cannula for the superficial liposuction. Total aspirate consisted of 370 ml from right side and 300 ml from left side. The subareolar, fibro-glandular tissue was significant and could not be pulled through the 4 mm access incisions so an inferior areolar incision was used to access the tissue. Surgical outcomes at 1 year are depicted in Fig. 7.5a–f. Specimens and aspirate are depicted in Fig. 7.5g, h.

A 24-year-old athletic, healthy male is seen in consultation regarding painful, unilateral gynecomastia of his left breast. VASER-assisted liposuction of the left chest with extraction of the subareolar, fibro-glandular tissue with the "pull-through" technique was recommended. The outpatient surgery was performed under general anesthesia. The author's wetting solution formula for general anesthesia was infused at 300 ml per minute up to a total of 600 ml. A 3.7 mm, two-ring, VASER probe was utilized at 80% energy level for 3 minutes in continuous mode. Aspiration was performed with a 3.7 mm VentX cannula for the deeper tissues and a 3.0 mm VentX cannula for the superficial liposuction. Approximately 300 ml of fat was extracted from the left chest followed by extraction of the glandular tissue with the "pull-through" technique. Surgical outcomes at 1 month are depicted in Fig. 7.6a–f. Tissue specimen and aspirate are depicted in Fig. 7.6g, h.

A 26-year-old male body builder presents at consultation with a 4-year history of painful, bilateral gynecomastia following several cycles of anabolic steroid injections. VASER-assisted liposuction with "pull-through" resection of the fibro-glandular tissue was recommended. Although the patient wanted a decrease in his breast volume and relief of the associated discomfort, he desired to maintain an athletic appearing chest contour. The surgery was performed under general anesthesia as an outpatient procedure. The author's wetting solution formula for general anesthesia was infused at 300 ml per minute to a total of 800 ml to each side. A 3.7 mm, two-ring VASER probe was employed at 90% energy in continuous mode for 3 minutes per side. Aspiration was performed with 3.7 mm VentX cannulas for the deep tissue and 3.0 mm VentX cannulas for the superficial liposuction. Total supernatant fat aspirate was approximately 280 ml from each side. The surgical outcomes at 6 months are depicted in Fig. 7.7a–f. The subareolar fibro-glandular tissue and VASER fat aspirate are depicted in Fig. 7.7g, h.

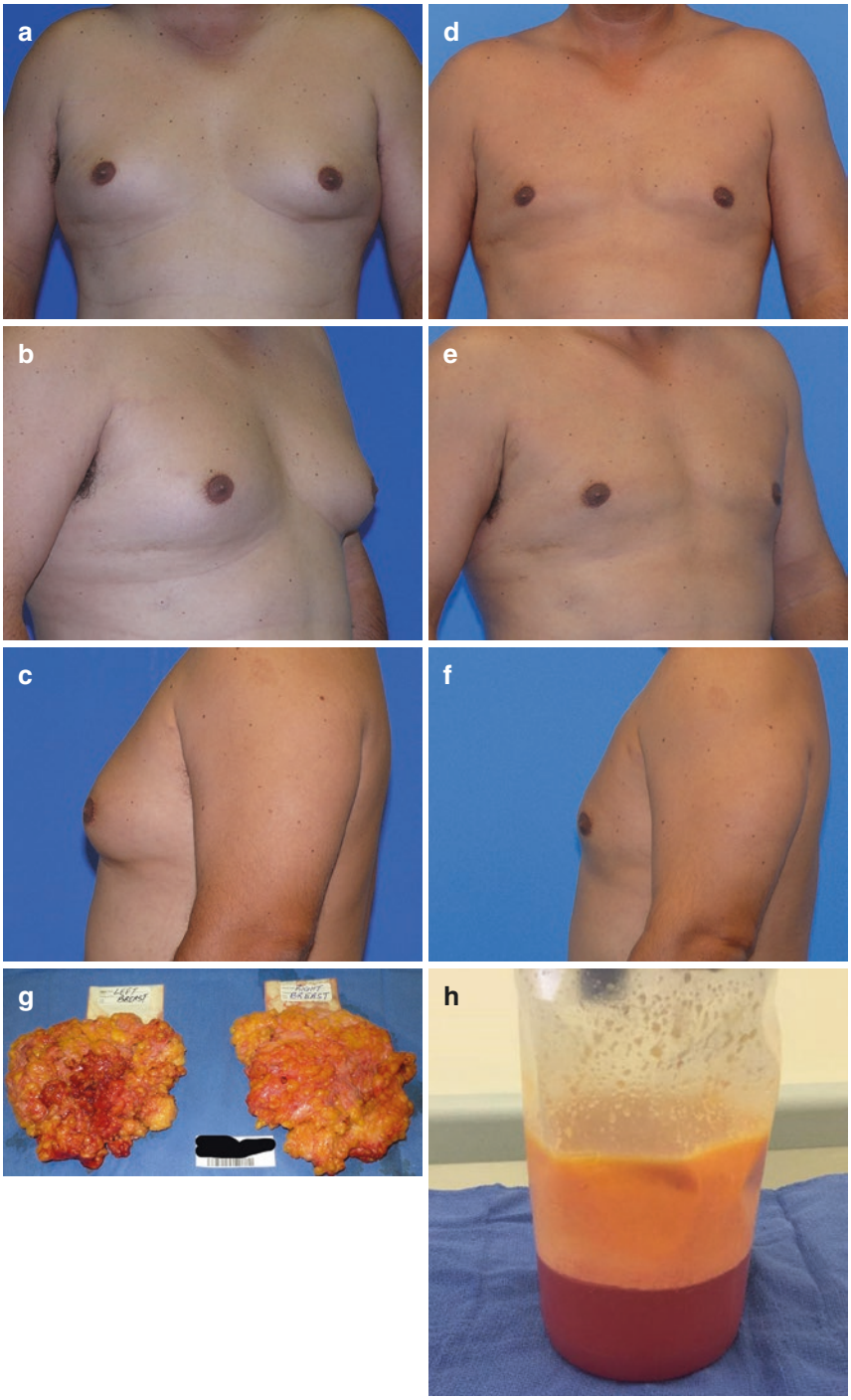

Fig. 7.5 (**a**–**f**) Surgical outcomes at 1 year of 44-year-old male post-VASER-assisted resection of bilateral gynecomastia. (**g**, **h**) Surgical specimen of fibro-glandular tissue and VASER aspirate

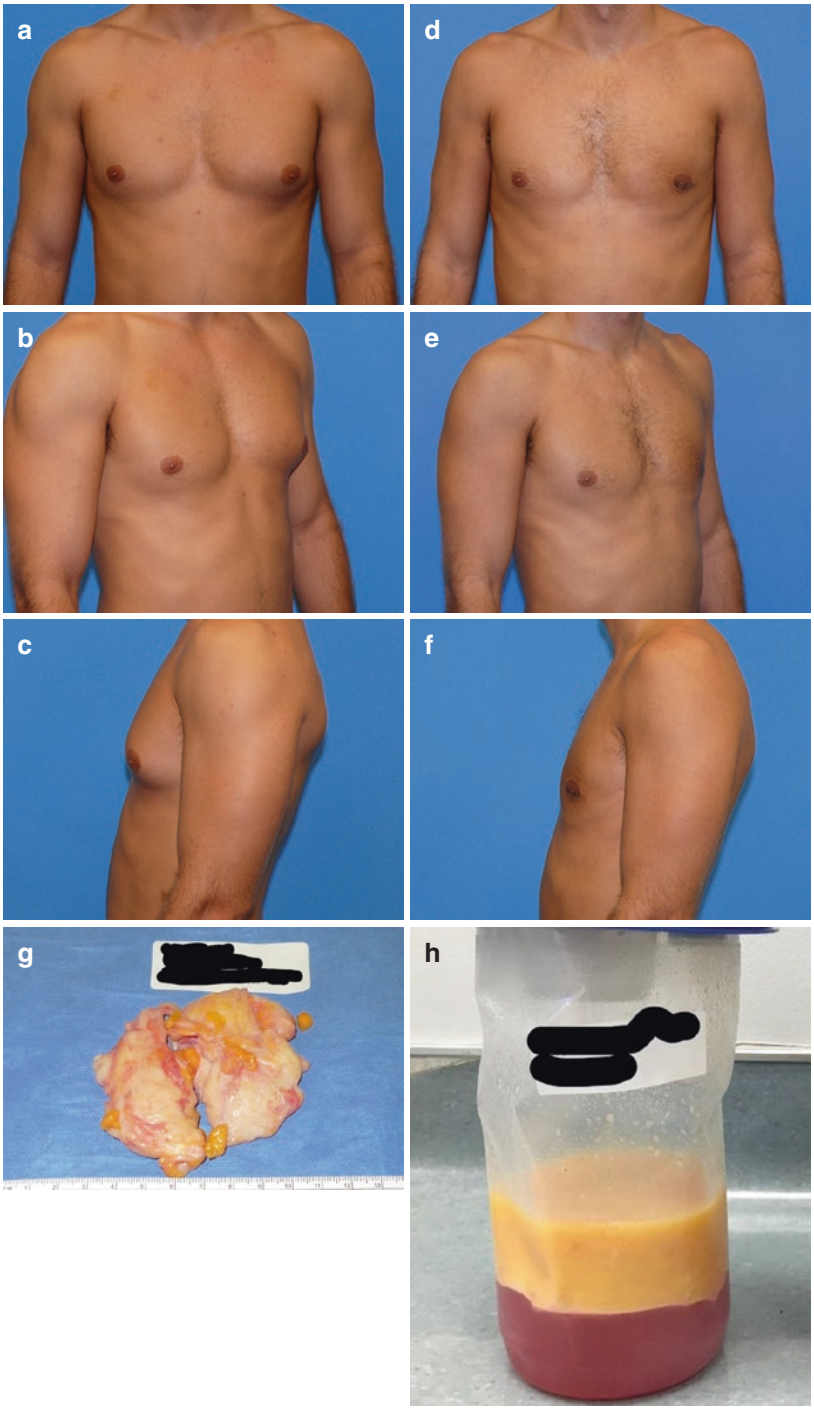

Fig. 7.6 (**a**–**f**) Surgical outcomes at 1 month of 24-year-old male post-VASER-assisted resection of unilateral left-sided gynecomastia. (**g**, **h**) Surgical specimen of fibro-glandular tissue and VASER aspirate

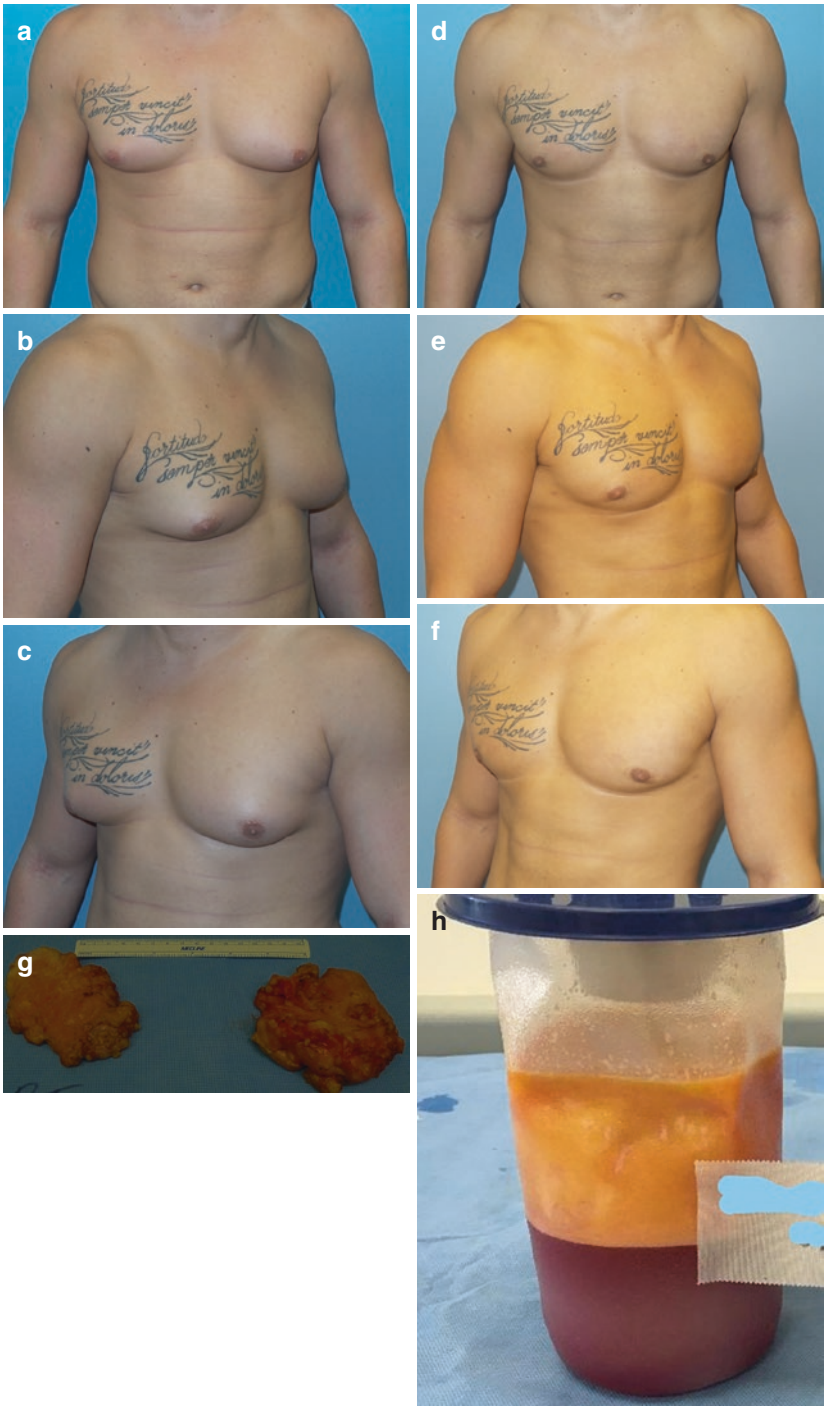

Fig. 7.7 (**a**–**f**) Surgical outcomes at 6 months of 26-year-old male post-VASER-assisted resection of bilateral gynecomastia. (**g**, **h**) Surgical specimen of fibro-glandular tissue and VASER aspirate

Conclusions

The author's preferred method for correction of gynecomastia in cases without skin resection involves VASER-assisted liposuction in combination with resection of the gland by means of a modified pull-through technique. This has been found to be a safe and efficient approach for the treatment of gynecomastia. This method is associated with highly favorable aesthetic results and relatively minimal postoperative downtime.

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