Liposuction excision of gynecomastia through an axillary liposuction opening: A novel technique

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Introduction
Gynecomastia has a negative impact on male self-esteem and social health. In the absence of a medically treatable condition, surgery is the only effective treatment. Treatment includes either liposuction, excision of male breast gland, or both. Excision of the breast tissue is usually performed through a circumareolar incision, which could be a site of infection, unsightly scar, nipple, areola inversion, or necrosis.

Aim
This study aimed to evaluate the outcome of liposuction excision of gynecomastia through a small axillary approach.

Patients and methods
One hundred and forty-three patients with gynecomastia, through the period from March 2010 to March 2014, in Minoufiya university hospital and other private hospitals were included in this study; their mean age was 24.3 years. After clinical and laboratory evaluation, liposuction and excision of glandular tissue was performed through the same stab of liposuction at the midaxillary line in the fifth or sixth intercostal spaces under general or local anesthesia; liposuction was first performed using the tumescent technique and then the glandular disc was released from its deep attachments and from subcutaneous and nipple attachments by scissors. Then, drains were inserted through the same liposuction excision opening and pressure bandage and garments were applied.

Results
One hundred and thirty-four (93.7%) patients showed satisfactory results after 6 months and 138 (96.5%) patients were satisfied with the results after 1 year in terms of proper symmetry and sound healing. One hundred and fifteen patients (80.4%) underwent surgery under general anesthesia and 28 patients (19.5%) underwent surgery under tumescent local anesthesia; the mean operative time was 55 min, the mean hospital stay was 9.6 h, and the average period off work was 5 days. Four patients (2.8%) showed unilateral hematoma formation, none of the patients showed saucer dish deformity, areola, nipple necrosis, or inversion, one patient (0.6%) developed a unilateral wound infection, two patients (1.4%) showed seroma formation, and two patients (1.4%) showed skin laxity.

Conclusion
The axillary liposuction excision technique was associated with very good esthetic results for both fibrous and fatty gynecomastia, with little complications.

Keywords:
excision, gynecomastia, liposuction

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Introduction

Gynecomastia is defined as a benign enlargement of the male breast. It is a common condition, with a prevalence in young patients as high as 38% [1,2]. Gynecomastia is the most common disorder of male breast, accounting for nearly 60% of all male breast disorders. It also accounts for 85% of male breast masses [3]. Gynecomastia has a trimodal peak of incidence and commonly presents in newborns, adolescents, and men older than 50 years of age; it causes considerable emotional discomfort and limitations in everyday activity in young men, and this is why it represents a psychosocial problem of social acceptance and emotional comfort [4]. In adolescents, surgery should be discussed after a period of 2 years as most cases of adolescent gynecomastia resolve within 6 months to 2 years [5]. Pseudogynecomastia is enlargement of the male breast, which can also result from obesity and fat deposition [6]. Gynecomastia was classified by Webster in the 1930s into the following three categories:

Type one was glandular, type two was 'fatty glandular', and type three was 'simple fatty'. Simon *et al.* [7] classified

gynecomastia in 1973 according to morphology and volume into four different groups:

(1) I: minor breast enlargement without skin redundancy.
(2) IIa: moderate breast enlargement without skin redundancy.
(3) IIb: moderate breast enlargement with minor skin redundancy.
(4) III: gross breast enlargement with skin redundancy that mimics female breast ptosis.

Bannayan and Hajdu [8] have described three histological types of gynecomastia: florid, fibrous, and intermediate. In the majority of cases, if the duration of gynecomastia is greater than 1 year, the fibrous type is more prevalent and irreversible, which may limit the success of medical treatments. In the absence of medically treatable conditions, surgery is the main line of treatment. Surgical approaches to the treatment of gynecomastia include subcutaneous mastectomy, liposuction-assisted mastectomy, laser-assisted liposuction, and laser lipolysis without liposuction. Complications of mastectomy may include hematoma, surgical wound infection, breast asymmetry, changes in sensation in the breast, necrosis of the areola or nipple, seroma, noticeable or painful scars, keloid formation of the scar, and contour deformities [9–11]. The first description of surgical treatment for gynecomastia was provided by Paulus Aegineta (635–690 AD), a Byzantine Greek physician who described breast reduction mammoplasty using a semilunar inframammary incision [12]. Several treatments for gynecomastia have been described in the literature since the 19th century. Subcutaneous mastectomy as a treatment for gynecomastia was described by Webster [13] in 1946, and was the treatment of choice up to the 1980s. The introduction of suction-assisted lipectomy by Illouz [14] in the late 1970s improved the treatment of gynecomastia because it enabled the contouring of diffusely enlarged breasts, resulting in only small scars. In the late 1980s, Zocchi [15] developed ultrasound-assisted liposuction (UAL), a technique that allows selective destruction of adipose tissue. In the last decades, more attention has been paid to esthetically acceptable and minimally invasive approaches in the management of gynecomastia. Teimourian and Perlman [3] described liposuction-assisted excision in the 1995s; UAL was introduced successfully in 87% of cases with various grades of gynecomastia [16]. Endoscopic techniques were used by Eaves *et al.* [17] in 1995 in an attempt to avoid violation of the nipple areola complex, whereas Ramon *et al.* [18] in 2005 linked the power-assisted liposuction (PAL), PAL technique with endoscopic-assisted pull-through excision. Then, Lista and Ahmad [19] in 2008 reported the use of the pullthrough technique in combination with PAL. In 2010, Qutob *et al.* [20] reported a case series of 36 patients who underwent vacuum mammotome resection of gynecomastia through one opening and another opening for liposuction. The utility of pathologic examination of breast tissue removed from male adolescent gynecomastia patients has recently been questioned because of the rarity of breast cancer in this population [21].

In this study, our objectives were to evaluate the applicability and safety of conventional liposuction plus excision of gynecomastia through a single midaxillary liposuction stab and to report any complications.

Patients and methods

Through the period from March 2010 to March 2014 in Minoufiya University Hospital and other private hospitals, 143 patients with gynecomastia were included in this prospective study. Their age ranged from 16 to 53 years, with a mean age of 24.3 years. Patients with all grades of gynecomastia were included in this study, except Simons grade III. The assessment of disease history, and clinical and laboratory evaluation were performed to exclude any medical cause of gynecomastia, for example, drugs, hormonal, or adolescent gynecomastia of less than 2 years' duration. Informed consent was obtained and patients were clearly informed of the possibility that a periareolar incision may have to be performed if excess bleeding occurred that required definitive hemostasis. This was followed by marking of the topography of the outlines of breast tissue and areas of fat excess and the most prominent areas under the areola and nipple. The anterior, mid, and posterior axillary lines were marked and the liposuction stab points were marked bilaterally at the level of the fifth or sixth intercostal spaces (Fig. 1). All patients were treated on a day-case basis. Skin preparation was performed and wetting fluid was used (1000 ml normal saline, 20 ml lidocaine 2%, and 1 mg epinephrine) for local anesthesia. Only epinephrine was added and no local anesthetic was added to the normal saline if general anesthesia was administered. After a period of 15 min, a 4 mm or a 5 mm round-tip Mercedes cannula was used for the initial suction using the palm down and pinch techniques. The final contouring was performed and changes were constantly monitored by direct observation. The periphery of the breast was feathered to produce a smooth transition to avoid saucer dish deformity (Fig. 4). It was found that parts of the soft lobular tissue could be suctioned in certain cases. Continuous suction attempts were made in an attempt to reduce the firm retroareolar glandular disc to the

least compact size. The remaining glandular tissue was separated from its deep attachments from the pectoralis major muscle and fascia by scissors. Then, the breast tissue was separated from its cutaneous attachment using scissors and better using sinus scissors through the same liposuction opening without the need to make another incision (Figs 2 and 3). On a few occasions, we had to extend the stab wound to 8–10 mm to excise and deliver larger glandular tissue. Careful leaving a substantial disc of ductal tissue attached to the areola will enable healing in a convex and natural manner (Fig. 4). A Kocher forceps was introduced through the liposuction opening to deliver the glandular tissue step by step as one mass or pieces and scissors were used to release any attachment (Figs 2 and 3); then, the cavity was milked to evacuate any free remnants through the liposuction opening. Hemostasis was checked by excluding excess bleeding for few minutes while performing the other side, then a 16 or better 18 Fr suction drain was lifted into the cavity through the same liposuction stab on both sides. Then, elastic bandage was immediately applied for 24 h and use of a pressure garment was continued for 2–6 weeks. A specimen was sent to the pathologist for examination. Postoperative antibiotic and analgesics were prescribed for 5 days. All patients were re-evaluated in the first 24 h after surgery to rule out hematoma formation. Evacuation of any hematomas at the earliest possible interval is of key importance in the postoperative management. Patients were followed up over a period of 12 months at 2-month intervals after frequent visits in the first 2 months. The patients were informed that skin irregularity is common during the first 2 months postoperatively, and generally with skilled surgery, the breasts ultimately appear smooth and acceptable. Also, they were informed that slight areola distortion could occur and this often improves over 8 months to 1 year.

Results

A total of 143 patients were included in this study; 134 (93.7%) patients showed satisfactory results after 6 months and 138 (96.5) patients were satisfied with the results after 1 year. One hundred and fifteen patients underwent surgery under general anesthesia and 28 patients (19.5%) underwent surgery under tumescent anesthesia. Their age ranged from 16 to 53 years, with a mean of 23.4 years. The operative time ranged from 45 to 92 min, with a mean of 55 min. The volume of fat suctioned from both breasts ranged from 150 to 1350 ml, with a mean of 520 ml; the mean weight of excised tissue bilaterally ranged from 80 to 260 g, with a mean of 135 g. The hospital stay ranged from 6 to 13 h, with a mean of 9.6 h. The average time off work was 5 days, ranging from 2 to 7 days. Two patients showed seroma formation and were managed by frequent percutaneous aspiration. Four patients 2.8% showed unilateral hematoma formation: two patients had moderate hematoma of 100 and 180 ml, respectively, and two patients had minor hematoma of about 50–90 ml, respectively. Patients with hematoma were managed at the outpatient clinic where the obstructed drain was removed, the clotted blood was evacuated and irrigation by warm saline through the liposuction opening. A new drain was re-inserted through the primary incision and was left for a few days along with application of tight bandage for 3 days. No asymmetry appeared in the follow-up period and no saucer dish deformity occurred. Despite some early irregularity of the contour of the areola and nipple, a smooth contour began to develop at 4–6 weeks postoperatively. No areola or nipple necrosis or inversion occurred in any of the cases throughout the follow-up period. One patient (0.6%) developed unilateral wound infection, which was treated conservatively. Seventy-six patients showed skin laxity that resolved over 5–7 months,

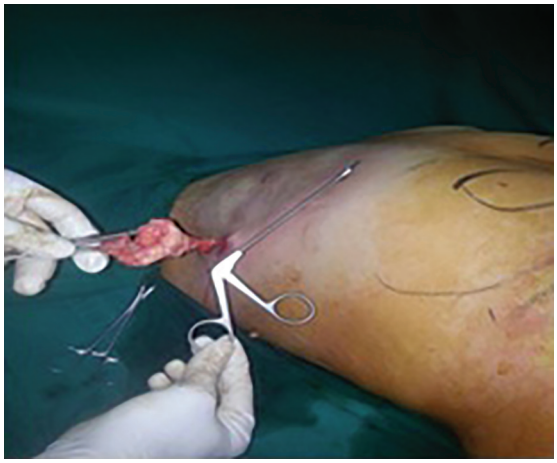
Figure 1

Topography of the breast and incision.

Figure 2

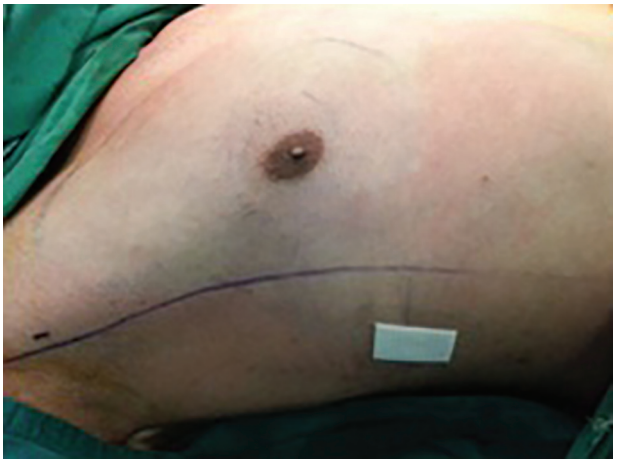
Use of scissors to release the glandular disk.

Figure 3



Delivery of the gland from the liposuction wound.

Figure 4



Smooth transition of breast and unviolated areola.

but two patients (1.4%) showed mild skin laxity and irregularity that continued after 1 year of follow-up; patients did not request revision surgery as the size of the breast was of primary concern to him. Areola and nipple sensation was lost early in 52 patients (36.3%); 36 (69.2%) of the 52 patients gradually recovered their sensation over 7 months and a total of 41 patients (78.8%) recovered their sensation after 1 year. Only 11 patients had altered nipple and areola sensation after 1 year. There was no reported cancer in any of the pathological specimens. The technique was easier with the use of sinus scissors, which facilitated sharp dissection of the far medial breast tissue and the peripheries (Fig. 2).

The results are presented in Tables 1–3 and Figs 4–7.

Table 1 Demography and result parameters

Result parameters	Range	Mean
Age (years)	16–53	23.4
Operative time (min)	45–92	55
Hospital stay (h)	6–13	9.6
Amount of aspirated fat (ml)	150–1350	520
Weight of excised glandular tissue (bilaterally) (g)	80–260	135
Time off work (days)	2–7	5

Table 2 Anesthesia and patient satisfaction

Result parameters	Number of patients (%)
Type of anesthesia	
General	115 (80.4)
Local	28 (19.5)
Pseudogynecomastia	24 (16.7)
Patient satisfaction after 3 months	134 (93.7)
Patient satisfaction after 12 months	138 (96.5)

Table 3 Complications

Complications	Number of patients (%)
Hematoma	
Small	2 (1.3)
Medium	2 (1.3)
Seroma	2 (1.3)
Nipple	
Inversion	0
Necrosis	0
Infection	2 (1.3)
Hypertrophic scars	0
Keloid	0
Asymmetry	0
Loss of sensation	
Temporary	52 (6.3)
After 1year	11 (7.6)
Saucer dish deformity	0
Skin laxity after 1 year	2 (1.3)
Breast cancer in biopsies	0

Discussion

Gynecomastia has a negative impact on male self-esteem and social health, and to date, surgery has been the mainstay of treatment. The ideal goal is to remove the excess breast tissue together with achievement of symmetry with minimal scarring. Conventionally, liposuction in gynecomastia is performed by one or two small incisions on each side of the chest [22,23]. The gland is excised through a periareolar incision [13,24]. The scars of the periareolar incision, the liposuction openings, and that of the drains still have a negative impact on the esthetic results [25].

Subcutaneous mastectomy through a periareolar incision is the most commonly used technique. Its combination with liposuction and feathering of the breast periphery result in better cosmosis and avoidance of crater deformity. As a periareolar incision is performed, it leads to the risk of development of wound-healing complications, especially keloid formation, tethering of the areola and nipple to the pectoralis muscle,

Figure 5

Scar away from the pectoral esthetic unit.

Figure 6

Preoperative and postoperative photo.

Figure 7

Preoperative and postoperative photo.

nipple and areola necrosis, and altered periareolar sensation [10,11]. Although the combined periareolar incision and liposuction can successfully remove the glandular and fatty element of the condition, the risk of development of potential complications because of the use of an open procedure mentioned above still remains. UAL has yielded good results in terms of fat suction; unfortunately, it has no effect on the firm glandular retroareolar tissue and thus excision remains a mainstay of treatment for this condition. Another disadvantage of (UAL) is the need for continuous cooling to prevent skin burns from the thermal contact generated at the point of entry [9,23,26,27]. Another disadvantage is the risk of demyelination-type injury of nerves, which can result in variable degrees of nerve damage [25,27–29]. Other surgeons have used the pullthrough technique successfully with UAL [23] or PAL [19]. Eaves *et al.* [17], in 1995, described an endoscopic-assisted excision for surgery without violation of the areola and nipple, where three incisions were used, and this technique did not completely eliminate the potential complication of a scar on a visible part of the chest; in this technique, three incisions were used. Bracaglia *et al.* [31], in 2004, combined suction-assisted lipectomy and the pullthrough technique using an inframammary crease incision and an incision overlying the sternum. Mentz *et al.* [31], in 2007, described another effective technique: correction of gynecomastia through a single puncture incision at the 6-o'clock position of the areola combined with a separate incision for liposuction at the anterior axillary fold.

In 2010, Petty *et al.* [33] reported their experience with UAL and the arthroscopic shaver to resect the subareolar fibrous component. Morselli and Morellin *et al*. [34], in 2012, reported their 15 years' experience with the use of the pullthrough technique, with satisfactory results, but again they used two incisions: one in the inframammary fold and the other behind the anterior axillary line. The above procedures place the incision in a prominent position, either over the sternum or the inframammary line or behind the anterior axillary fold, and may be visible either on the front or the sides of the patient's chest and may be unsightly if hypertrophy of the scar occurs. The above procedures also involve another incision for liposuction compared with our approach (Figs 4 and 5). Jarrar *et al.* [35], in 2011, used a single large incision in the anterior axillary fold 18 mm in size using endoscopic assessment after excision; again, the incision was more noticeable than the smaller and more posterior incision and not all cases required direct hemostasis.

The far midaxillary point of liposuction represents another advantage, especially if we use the sixth intercostal space level; thus, the fat lateral to the breast and below the arm bit can be suctioned in up, down, medial, and posterior directions from the same stab.

Another advantage of our single far approach is that some enlarged male breasts cannot be accurately judged clinically to be either true or pseudogynecomastia; this was encountered in about 24 patients (16.78%). Therefore, only liposuction was sufficient for such cases, with no further need for any other incisions. This means that an incision at the periareolar region is not useful in case of pseudogynecomastia and can result in another unwanted scar, with potential wound complications.

Together with application of tight elastic bandage, the use of epinephrine containing tumescent fluid minimized the operative and postoperative bleeding. In this study, hematoma occurred in four patients: two patients had minor hematoma and the other two patients had moderate hematoma. Early hematoma evacuation and irrigation by normal saline was the mainstay of treatment. Evacuation was performed in the outpatient clinic under local anesthesia, with no further complications. Temporary skin laxity and occasional asymmetry were present during the first 3 months, but no asymmetry persisted over 3 months. Skin laxity was encountered and the patients were reassured that this is a normal outcome following such surgery and will resolve over a few months after skin shrinkage. In this study, use of the transaxillary approach yielded very good esthetic results; the stab of liposuction remained concealed in the midaxillary region. The technique is applicable and the scar is hidden (Figs 1, 4 and 5). One more advantage that liposuction of the fatty areas lateral to the breast can be suctioned from the same stab, and any potentially unwanted complications, especially hyperpigmentation, hypopigmentation, keloid, hypertrophic scars, and tethering, will be away from the pectoral esthetic unit Figs 4 and 5.

Conclusion

The axillary liposuction excision technique was safe and associated with good esthetic results. The technique is suitable for those who stress to appear unoperated.

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Conflicts of interest

There are no conflicts of interest.

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