



Gynecomastia: Diagnosis and Treatment Experience of the Plastic and Burn Surgery Department in Rabat A Case Series of 15 Patients

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Abstract: Gynecomastia is the most common male breast disorder [1]. It is defined in men as a benign glandular hyperplasia of the breast tissue. Its prevalence is estimated between 32% and 65% and varies significantly with age (newborns, adolescents, and adults) and depending on the definition used. It can present unilaterally or bilaterally.

The objective of our study is to present a series of 15 operated patients and to discuss the technical choices used to treat this condition, as well as to evaluate the functional and aesthetic outcomes.

Diagnosis is primarily clinical, but additional investigations help identify the etiology — which in most cases is idiopathic — and determine whether the gynecomastia is glandular, fatty, or mixed (glandular and fatty), thus guiding the therapeutic approach.

Several classification systems have been proposed to assess the severity of gynecomastia. The most widely used is the Simon classification, established in 1973 [4]. It categorizes gynecomastia into 3 grades subdivided into 4 stages, based on breast volume and skin excess. The extent of breast enlargement and skin redundancy directs the choice of surgical technique, which may include liposuction, subtotal mastectomy, total mastectomy with areola-nipple complex grafting, or inverted-T reduction mammoplasty.

In our study, the overall satisfaction rate was 85%, with a complication rate of 13.3%.

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I. Introduction

Gynecomastia is the most common male breast disorder [1]. In men, it is defined as a benign glandular hyperplasia of breast tissue. Clinically, it manifests as an abnormal enlargement of one or both breasts. Gynecomastia results from a hormonal imbalance between estrogens and androgens in favor of estrogens [2]. Its prevalence is estimated at 32–65% and varies widely according to age group and the diagnostic criteria applied. Three incidence peaks have been described: gynecomastia develops in 65–90% of newborns, 22–69% of adolescents, and 36–57% of men in their fifth to seventh decades [3]. In most cases, gynecomastia is idiopathic; however, a systematic etiological workup must be conducted to rule out an organic cause, particularly the presence of a malignant tumor or a drug-induced origin. While the majority of cases are idiopathic and tend to regress spontaneously, surgical treatment may be considered when the condition persists and leads to morphological and/or psychological discomfort.

Several classification systems have been proposed to assess the severity of gynecomastia. The most commonly used is the Simon classification, established in 1973 [4]. It categorizes gynecomastia into 3 grades subdivided into 4 stages, based on breast volume and the degree of skin excess. Indeed, the extent of breast enlargement and skin redundancy guides the choice of surgical technique.

Several surgical techniques for the correction of gynecomastia have been proposed, ranging from the most invasive—total mastectomies—to minimally invasive techniques described by Morselli in 1996, which involve fragmenting the gland and removing it through liposuction incisions [5]. The most commonly used technique today combines a periareolar approach, as described by Webster in 1946 [6], with liposuction as described by Illouz in 1970 [7].

The objective of our study is to present a series of 15 operated patients and to discuss the technical choices made in the treatment of this condition, as well as to evaluate the functional and aesthetic outcomes.

II. Patients and Methods

This is a retrospective, descriptive study involving 15 male patients who underwent surgery for gynecomastia (10 bilateral cases and 5 unilateral cases) between January 2024 and June 2025. Data were collected from archived medical records. The following parameters were considered: reason for consultation, age at the time of management, the period of onset of gynecomastia (childhood, puberty, or adulthood), overweight status (defined as a BMI >25 kg/m²), personal and family medical history, etiology (idiopathic or secondary to an organic or drug-related cause), clinical examination, Simon classification stage, gynecomastia consistency, length of hospital stay, type of surgery performed, complications, and functional and aesthetic outcomes.

The quality of postoperative results was assessed based on the occurrence of complications and the number of revision procedures required.

III. Results

Ten patients (67%) presented with bilateral gynecomastia, while 5 patients (33%) had unilateral gynecomastia. The mean age at the time of surgical management was 24 years, ranging from 17 to 45 years. In 80% of cases, gynecomastia developed during puberty. Breast enlargement associated with painful discomfort was the main reason for consultation in all patients.

None of the patients presented with galactorrhea or cancer phobia.

Among the 15 cases studied, 12 had pubertal gynecomastia. One patient had a history of anabolic steroid use, and two others had gynecomastia that developed outside the pubertal period.

None of our patients had a personal or family history of breast cancer.

Six patients (40%) were overweight, with a body mass index (BMI) greater than 25 kg/m², while the remaining nine patients (60%) had a normal BMI.

The consistency of the gynecomastia was assessed during clinical examination and systematically supported by ultrasound imaging. Based on this assessment, 3 patients (20%) had fatty-type gynecomastia, 9 patients (60%) had glandular gynecomastia, and 3 patients (20%) had mixed gynecomastia (glandular and fatty components). Physical examination of the testes, testicular ultrasound, neurological assessment, and evaluation of other organ systems were normal in all patients except for two, who presented with micropenis associated with bilateral testicular hypotrophy.

Regarding gynecomastia, the condition was considered idiopathic in 13 patients after laboratory investigations (FSH, LH, testosterone, prolactin, estrogens, β -hCG, AFP, TSH, etc.); 2 patients had an underlying disorder—both suffered from hypogonadotropic hypogonadism.

The severity of gynecomastia was assessed using the Simon classification.

- Three patients (20 %) had Grade I disease,
- six patients (40 %) Grade IIa,
- three patients (20 %) Grade IIb, and
- three patients (20 %) Grade III, the most severe form.

All patients were referred to the plastic-surgery clinic after completion of the etiological work-up; none received medical therapy. Surgical treatment consisted of liposuction alone, subtotal mastectomy, a combination of liposuction and subtotal mastectomy, or total mastectomy with nipple–areola complex (NAC) grafting.

- A subtotal mastectomy with an inferior pedicle was performed in six patients (40 %).
- Six patients (40 %) underwent subtotal mastectomy via a hemi-periareolar approach combined with liposuction.
- Two cases required total mastectomy with NAC grafting.
- One patient underwent a superior-pedicle reduction mammoplasty following the Wise pattern.

Average operative time was approximately 40 minutes for subcutaneous mastectomy and 80 minutes for combined liposuction-mastectomy procedures and the other techniques.

Histopathological analysis of all excised specimens revealed no malignant tumors.

All patients included in the study underwent surgical treatment, with an average hospital stay of 2 days (range: 2 to 4 days).

All patients received appropriate analgesia, combined with a short course of antibiotics for 7 days. A customized compression protocol was applied for all patients, starting with a bulky compressive dressing, which was replaced during the first dressing change by a compression vest (Bolero-type garment).

Postoperative outcomes were uncomplicated in the majority of cases (87%).

Two complications were recorded in our study:

- One case of postoperative hematoma occurred at 7 hours post-op (D0 H7), requiring emergency reoperation to evacuate the hematoma and achieve hemostasis of a bleeding pedicle. A Redon drain was placed before closure.
- One case of transient venous congestion of the nipple–areola complex, which resolved spontaneously with the application of petroleum jelly dressings.

The evaluation of outcome quality was carried out for all patients during routine follow-up consultations, with a follow-up period ranging from 3 to 6 months. Assessment was both subjective—based on patient-reported outcomes—and objective, performed by the surgeon, considering qualitative aspects related to the patients' main concerns about scarring, as well as a quantitative measure using a global satisfaction scale ranging from 0 to 10.

The overall patient satisfaction rate in our study reached 85%.

Regarding the nipple–areola complexes (NACs), their position was rated at 8.5/10; some patients noted a very slight asymmetry. The overall aesthetic quality of the NACs was rated at 9/10. Criticisms mainly involved a lack of circularity of the areola, a cup-shaped appearance, and occasional flattening of the nipple.

The position of the infrapectoral scars was rated at 6/10, with some mild asymmetry observed in the subpectoral folds. Scar quality was rated at 7/10; criticisms included widened or hypertrophic scars, as well as the visibility of the scar.

IV. Discussion

The term “gynecomastia” is derived from the Greek words *gyne* (woman) and *mastos* (breast), meaning “female breast.” It is the most common male breast condition, with a prevalence ranging from 35% to 38% in young men [8,10].

From a histopathological standpoint, gynecomastia corresponds to a benign hyperplasia of the mammary glandular tissue, progressing through two distinct phases:

- The first phase, following the onset of gynecomastia, is an inflammatory stage lasting between 6 months and 1 year. During this phase, gynecomastia is tender and progressive. In most cases, it resolves spontaneously.
- The second phase is a quiescent or “cold” fibrotic stage, in which spontaneous regression is no longer possible. It is during this stage that patients are most frequently referred for surgical management.

Gynecomastia can occur during three key life periods [11]:

- **At birth**, where it is mostly transient and regressive;
- **During puberty** [12], the most common presentation;
- **And in adulthood**.

In our series, no cases of neonatal gynecomastia were reported. Most patients consulted during the peripubertal period, and to a lesser extent, in adulthood due to morphological discomfort. According to the literature, approximately 75% of patients with gynecomastia have a negative etiological workup, and the condition is thus classified as idiopathic. In our study, the rate of idiopathic gynecomastia was higher, at 87%.

This difference may be explained by the medical referral pathway: patients are often referred to surgery after completing their etiological assessment, provided it is negative.

The diagnosis of gynecomastia is straightforward and clinical. It typically presents as a round, mobile mass centered beneath the areola and mobile over deeper planes. It may be unilateral or bilateral, with proportions varying in the literature—from 14%, according to Wiesman et al. [13], to a 1:1 ratio reported by Colombo-Benkmann [14]—compared to 33% unilateral cases in our study.

In our series, 40% of patients were overweight, and mixed or fatty gynecomastia accounted for 20% of cases. Gynecomastia is frequently associated with excess weight and is then referred to as **adipogynecomastia**.

No tumors, particularly malignant ones, were identified in the excised specimens sent for histopathological analysis. This finding is consistent with the results reported by Lapid and Jolink [15], Boljanovic and Axelsson [28], Choi [29], and Innocenti [30].

The severity of gynecomastia in our series was assessed using the Simon classification. In the majority of cases (60%), the gynecomastia was of low severity (Grades I and IIa), meaning without skin excess. In these less severe grades, although there is no excess skin envelope, the areolae may appear stretched, sometimes producing a tuberos breast appearance.

In 40% of cases, skin redundancy was present. When the excess was minimal, no skin resection was necessary, and spontaneous retraction allowed satisfactory redraping in 20% of patients. In cases of significant skin excess (20%), total mastectomy with nipple–areola complex (NAC) grafting was performed. This outcome was favored by the young age of patients, good skin elasticity, and the use of a compressive bolero garment worn postoperatively for approximately two months.

In clinical practice, we prefer to guide therapeutic decisions based on clinical criteria evaluated on a case-by-case basis rather than relying solely on classification systems. A thorough preoperative evaluation allows tailoring of treatment based on:

- The volume of glandular and adipose tissue to be resected
- The presence or absence of skin redundancy and the degree of skin elasticity, which helps predict the likelihood of retraction
- The size and position of the nipple–areola complex
- The presence of a well-defined inframammary fold

The objective of surgical management for gynecomastia is to restore a masculine chest contour by eliminating breast volume, while aiming for the most discreet scarring possible, ideally in a single-stage procedure, and ensuring chest symmetry [16,17].

In the presence of skin excess, resection should be conservative, and correction should also aim to eliminate any residual inframammary fold. The nipple–areola complexes (NACs) must be repositioned anatomically—either through grafting or using the round-block technique—and their diameter reduced to 25 mm in cases of enlargement caused by gynecomastia.

A major challenge lies in achieving proper placement of the areolae to avoid feminization of the chest. In males, the areola typically has a diameter of 20 to 40 mm and is located approximately 20 cm from the sternal notch, with a slight lateral offset. Anatomically, it projects at the junction of the upper third of the arm and a vertical line about 2 cm anterior to the anterior axillary line.

None of our patients underwent liposuction alone. According to some authors, liposuction of glandular tissue is technically possible; however, this approach alone appears to be associated with a higher recurrence rate (approximately 14% to 35%) [18]. Therefore, it is not our preferred method. Nevertheless, liposuction as described by Illouz is necessary to reduce the adipose panniculus, particularly in overweight patients and in cases of mixed gynecomastia involving the entire treatment area [7]. In most of our cases, it constituted the first step of the surgical procedure.

In our experience, initial liposuction helps reduce bleeding—first, by creating fibrous tunnels; second, through vasospasm induced by cannula trauma; and third, by the prior infiltration of epinephrine-saline solution. This also facilitates glandular dissection, even when using a limited hemi-periareolar incision.

In 6 cases (40%), a subtotal mastectomy was performed without liposuction. This technique was used in slim or muscular patients with minimal fat padding. Mastectomy remains the primary treatment for gynecomastia, effectively reducing the excess glandular volume, which is the main complaint of most patients. The inferior hemi-periareolar incision appears to be the approach of choice, as it ensures discreet scarring [19]. The mastectomy was "subtotal" in order to preserve a retroareolar glandular disc, which helps prevent a cupped, hollow appearance of the areola.

In our series, 40% of patients underwent a combination of subtotal mastectomy via a periareolar approach and liposuction, in order to smooth the contours [20] and detach the glandular plane from the muscular plane. This combined technique seems highly appropriate for mild gynecomastia (Simon Grades I and IIa), where there is no skin excess, as well as for Grade IIb cases with moderate skin excess, where skin retraction allows for satisfactory redraping.

In cases of more significant but non-severe skin redundancy, a skin resection using the round-block technique allows for its correction [21]. This approach avoids extended subpectoral scarring and the need for areolar grafting, thereby reducing the risk of areolar sensory loss and impaired contractility.

Finally, 20% of patients underwent total mastectomy with nipple–areola complex (NAC) grafting and inverted-T reduction mammoplasty using the Wise pattern. These cases corresponded to patients classified as Simon Grade III. Such cases represent a surgical challenge, as failure to perform skin resection would result in an unsatisfactory aesthetic outcome [22].

However, this technique involves more significant scarring and carries a higher risk of visible and sometimes poor-quality scars. When total mastectomy is indicated, these considerations must be clearly discussed with the patient.

Two surgical techniques are possible in such cases:

- **The first** involves a derived mammoplasty technique with an inverted-T incision (anchor-shaped scar) using the Wise pattern [23], or a vertical scar according to Lejour [24]. In this approach, the nipple–areola complex (NAC) is vascularized via a superior or inferior dermal pedicle, depending on the surgeon's preference. This technique, however, tends to feminize the chest by projecting the breast, and therefore is not among our first-line choices.
- **The second** technique involves submammary incision mastectomy with NAC grafting as described by Wray [25]. This method is inspired by the Thorek technique used in female gigantomastia surgery [26]. It results in a masculinizing subpectoral scar and is our preferred option for treating gynecomastia with significant skin excess [27].

In the literature, gynecomastia surgery is considered to have a high complication rate, ranging from 15% to 22.1% according to Benjaafar [32], which is notably higher than the rate observed in our study (13.3%). The complications recorded in our series included one case of postoperative hematoma at 8 hours post-op (D0 H8), and one case of transient venous congestion of the NAC.

Overall, the techniques employed resulted in satisfactory aesthetic outcomes in 85% of cases, slightly higher than those reported by Benjaafar and Ngo [31][32]. The average hospital stay was 2 days, comparable to findings from other studies [31][32].

Short hospital stays attest to the overall simplicity of postoperative recovery and are an important factor in our decision-making algorithm for the surgical management of gynecomastia. The duration of hospitalization may be correlated with the surgical technique used and whether or not drainage systems were implemented.

The most challenging parameter remains skin redundancy. When minimal or absent, correcting the excessive breast volume alone is usually sufficient to achieve a satisfactory result. However, when the excess skin is more pronounced, the surgeon faces two options: either rely on sufficient spontaneous skin retraction or proceed directly with skin excision—at the cost of more visible scarring. Another approach is to delay the skin excision, even when deemed necessary, in anticipation of a possible secondary revision. In that case, the final scar may be shorter. This decision should be made in collaboration with the patient, who may influence the surgical strategy. Some patients prefer a one-stage procedure even if minor imperfections remain, while others opt for a staged approach to minimize scarring.

The amount of preoperative subcutaneous fat is the second key factor affecting the quality of the outcome. Initial liposuction significantly reduces fat volume. However, this may lead to contour asymmetries, skin irregularities, or even retraction and deep adhesions. In such cases, **lipofilling** becomes the secondary corrective option to refine imperfections.

In the two patients who underwent total mastectomy with nipple–areola complex (NAC) grafting, overall satisfaction was good—likely inversely related to the severity of the initial presentation. However, the main complaints were visible and mildly unaesthetic scars, as well as asymmetry, often attributed to asymmetric neo-inframammary folds caused by the original gynecomastia. Regarding the areolae, a cupped appearance was partially due to over-defatting during graft harvesting. We recommend resecting a crescent of inferior skin during the lower hemi-periareolar approach to subtly reduce areolar diameter. The visual result is usually satisfactory, even if the nipple appears slightly eccentric.

The appearance of the areola is also a critical component of the aesthetic outcome. In men, the areola typically has a small diameter (no more than 30 mm). When grafted, it tends to deform and become oval or overly large. When preserved, it may still appear cupped despite maintaining a retroareolar glandular disc. This cup-shaped appearance can be corrected with lipofilling to adjust the contour and slightly reduce the diameter.

V. Conclusion

Subtotal subcutaneous mastectomy via a periareolar approach, preceded by liposuction, allows for the effective treatment of the vast majority of gynecomastia cases—provided there is no significant skin excess, or at most, only a moderate excess (i.e., Grade I, IIa, or IIb gynecomastia with minimal skin redundancy). However, the surgical approach must be tailored to clinical findings during the initial evaluation, and one should not hesitate to opt for a more radical treatment—such as total mastectomy—in cases of severe gynecomastia (Grade IIb with significant skin excess or Grade III).

The authors recommend combining **liposuction with subcutaneous mastectomy** due to its many advantages: reduced intraoperative blood loss, satisfactory skin redraping, short hospital stay, and the ability to perform histological examination of the excised tissue.

Both functional and aesthetic outcomes are highly satisfactory in most cases, with minor morbidity and negligible cosmetic sequelae.

Tableau 1 : Simon Classification (1973)

Grade I Mild breast enlargement without skin excess	Grade IIa Moderate breast enlargement without skin excess
Grade IIb Moderate breast enlargement with skin excess	Grade III Marked breast enlargement with significant skin excess and presence of an inframammary fold

Clinical Case No. 1



This is a 25-year-old male patient presenting with bilateral Grade IIa gynecomastia. He underwent a **subtotal mastectomy via a lower hemi-periareolar approach**.

Clinical Case No. 2



This is a 23-year-old male patient presenting with bilateral Grade I gynecomastia. He underwent a **subtotal mastectomy via a lower hemi-periareolar approach**.

Clinical Case No. 3



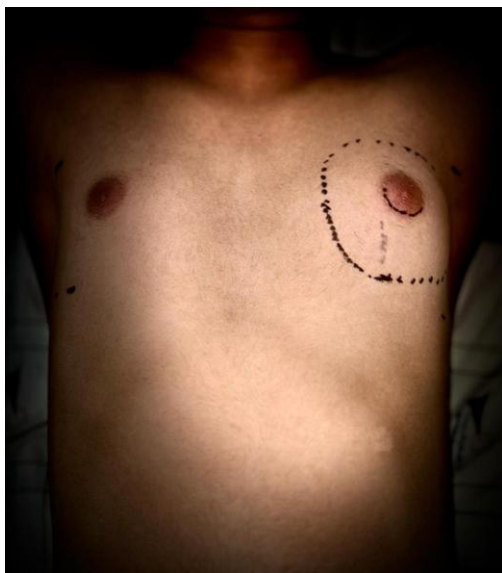
This is a 25-year-old male patient presenting with left-sided unilateral Grade III gynecomastia. He underwent a **superior pedicle inverted-T reduction mammoplasty using the Wise pattern**.

Clinical Case No. 4



This is a 22-year-old male patient presenting with bilateral Grade IIb gynecomastia. He underwent a **subtotal mastectomy via a lower hemi-periareolar approach**.

Clinical Case No. 5



This is a 20-year-old male patient presenting with left-sided unilateral Grade I gynecomastia. He underwent a **subtotal mastectomy via a lower hemi-periareolar approach**.

Clinical Case No. 6



This is a 24-year-old male patient presenting with bilateral Grade IIb gynecomastia. He underwent a **subtotal mastectomy via a lower hemi-periareolar approach**.

Clinical Case No. 7



This is a 25-year-old male patient presenting with Grade III gynecomastia. He underwent a **total mastectomy with nipple-areola complex (NAC) grafting**.

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