Gynecomastia – Conservative and Surgical Management

Kristin Baumann

Clinic for Gynecology and Obstetrics, University Medical Centre Schleswig-Holstein Campus Lübeck, Lübeck, Germany

Keywords

Gynecomastia · Male breast tissue ·
Pseudogynecomastia

Summary

Gynecomastia is defined as a unilateral or bilateral persistent benign mammary gland enlargement in men. Prevalence of asymptomatic gynecomastia is up to 65%. True gynecomastia must be distinguished from pseudogynecomastia. Typically, in true gynecomastia, a solid tissue mass is palpable below the nipple-areolar complex. Malignant changes such as male mammary carcinoma must always be ruled out. The causes of gynecomastia are diverse. An imbalance of female to male hormones triggers the onset of the disease. This imbalance can be caused by endogenous diseases like hyperthyroidism, chronic liver disease, primary or secondary gonadal failure, androgen resistance syndromes, medication, and drug abuse. A series of heart or hypertension medications can also trigger gynecomastia. A basic requirement of proper therapy planning is knowledge of the triggers and possible drug therapy options. Inquiring about the patient's lifestyle and medication history is essential. Drug therapy with tamoxifen may be considered at an early stage. For gynecomastia persisting over 12 months, surgical excision is the treatment of choice, and there are several surgical options available depending on the grade of the gynecomastia. A thoughtful approach to managing this condition can lead to high patient satisfaction.

© 2018 S. Karger GmbH, Freiburg

Introduction

A supernatant of male mammary tissue is a common finding and appears uni- or bilaterally in 32–65% of all men [1–3, 5] (fig. 1–4). The term gynecomastia originates from the Greek words *gyne* (women) and *mastos* (breast) and describes a feminization of the

male breast [4]. True gynecomastia is caused by a proliferation of the mammary glands with emerging dense subareolar glandular tissue [5] and must be distinguished from pseudogynecomastia due to fat deposits in obesity. The classification of gynecomastia is based on clinical examination measuring the volume and degree of ptosis of the glandular tissue [6] (table 1). In most cases, gynecomastia is asymptomatic; however, it can be associated with pain and tenderness of the mammary gland. Psychologic impairments due to a disturbed body image are common and especially affect adolescents [7].

Etiology

The causes of gynecomastia are multifactorial, and 25% of all cases appear idiopathically. Among the underlying causes, 3 groups of triggers are distinguished: physiologic, pathologic and pharmacologic/toxic. Pathophysiologically, female hormone imbalance has been shown to trigger glandular growth. This imbalance may in turn also be of pathologic or physiologic/idiopathic origin. There is strong evidence for the stimulating effect of estrogen on breast tissue development. Any disorder or medication leading to female hormone imbalance can trigger gynecomastia. Endogenous diseases like hyperthyroidism, chronic liver disease, primary or secondary gonadal failure, androgen resistance syndromes, medication, and lifestyle factors like drug abuse represent typical causes of gynecomastia [8] (table 2). In most cases, gynecomastia is caused by short-term hormonal fluctuations that limit themselves physiologically, which can occur neonatally, during puberty, and in elderly men. In the neonatal period, a preliminary physiologic bilateral mammary glandular swelling is triggered by maternal placental estrogens and resolves within a few weeks after birth. In adolescence, physiologic pubertal gynecomastia can develop and may last up to 6 months. This is triggered by a relative estrogen excess, mainly due to peripheral aromatization of the testicular and adrenal androgens. Testicular testosterone production increases in late puberty and leads to a spontaneous regression of the gynecomastia [9]. Due to a decrease in testosterone production and an increase in sex hormone-binding globulin, gynecomastia is also common in elderly men.

Fig. 1. Gynecomastia preoperative, frontal.
Fig. 2. Gynecomastia preoperative, side view right.

Fig. 3. Gynecomastia preoperative, side view left.
Fig. 4. Gynecomastia, frontal.

Table 1. Classification of gynecomastia [6]

Grade I	minimal hypertrophy
Ia – primarily glandular	<250 g breast tissue
Ib – primarily fibrous	
Grade II	moderate hypertrophy
Ila – primarily glandular	250–500 g breast tissue
Ilb – primarily fibrous	without ptosis
Grade III	severe hypertrophy
	>500 g breast tissue
	with grade I ptosis
Grade IV	severe hypertrophy
	with grade II–III ptosis

Diagnosis

The first step in the diagnosis of gynecomastia is to differentiate between pseudogynecomastia and true gynecomastia. In the case of true gynecomastia, clinical examination by palpation followed by ultrasound examination (fig. 5) and if necessary mammography (fig. 6) reveal glandular tissue. Palpation of the breast should already be able to clinically distinguish fatty tissue from glandular tissue and should include a more detailed assessment of the breast such as ptosis, skin excess, and nipple retraction. The physical examination should also extend to testicular palpation in order to detect testicular changes and atrophies at an early stage and to pave the way for further diagnostic measures. In particular, in young men with a negative history and bilateral gynecomastia, the incidence of testicular endocrine tumors is showing a significant increase [10].

The diagnosis of gynecomastia must be confirmed histologically by a sonographically correlated core biopsy to exclude malignancy (fig. 7), showing a 90% sensitivity and specificity [11]. A careful his-

Fig. 5. Breast sonography on both sides.

Fig. 6. Mammography, MLO.

Fig. 7. Hematoxylin/eosin, $\times 2$; increased glandular elements are embedded in a cell-rich, partly edematous loose stroma and surrounded by abundant fatty tissue.

tory, especially with regard to lifestyle habits, drugs, and medications, is indispensable for the diagnosis. Recent changes, for example commencement of antihypertensive drug therapy, should be inquired about. Standard diagnostics include laboratory tests like human chorionic gonadotropin, luteinizing hormone, thyroid-stimulating hormone, testosterone, and estradiol [12]. Due to the circadian rhythm of hormone secretion, laboratory monitoring must be performed in the morning at the time of maximum hormone release [13].

Conservative and Surgical Management

Depending on the underlying cause, the therapy of gynecomastia may be conservative or surgical. Self-limiting physiologic forms of gynecomastia should be followed up until resolved. In the case of persistence or progress, if necessary, laboratory diagnostic tests should be repeated to detect hormonal processes as quickly as possible. Conservative therapy must be based on the cause of the gynecomastia.

Table 2. Causes of gynecomastia [3, 6, 8]

Physiologic	neonatal adolescent aging-related
Drug-induced	antihypertensive agents antibiotics hormones drugs gastrointestinal agents antiandrogens
Decreased androgens	primary (testicular) hypogonadism secondary (central) hypogonadism androgen insensitivity syndrome 5 α -reductase deficiency 17 β -hydroxysteroid dehydrogenase deficiency Klinefelter syndrome
Increased estrogens	adrenal/testis tumor testicular tumor human chorionic gonadotropin-secreting tumor familial aromatase excess syndrome (obesity)
Other	malnutrition cystic fibrosis alcoholism psychologic stress myotonic dystrophy herpes zoster infection

If hypogonadism is present, symptomatic therapy with testosterone is recommended.

In the case of medically induced gynecomastia, discontinuation of the drug or conversion to a different medication should be considered; however, it is not always possible to change or discontinue medication in these cases. While many antihypertensive medications lead to gynecomastia as a side effect, spironolactone has the

Fig. 8. Gynecomastia postoperative, periareolar subcutaneous mastectomy, frontal.

Fig. 9. Gynecomastia postoperative, periareolar subcutaneous mastectomy, side view left.

8

9

10

Fig. 10. Operative procedure according to Benelli [25].

Fig. 11. Operative procedure according to Kornstein [26].

11

Table 3. Surgical therapy of gynecomastia [24]

Stage I/IIA	liposuction periareolar subcutaneous mastectomy
Stage II B	liposuction periareolar subcutaneous mastectomy concentric mastopexy (fig. 10)
Stage III/IV	inframammary fold mastectomy (fig. 11)

strongest association with gynecomastia [14]. A lower incidence of gynecomastia was shown for the selective aldosterone antagonist, eplerenone [15]. If there is a history of triggers such as self-administered hormones for bodybuilding or drugs, these should be discontinued.

A conservative therapy option is the administration of serum estrogen receptor modulators such as tamoxifen. Tamoxifen at a daily oral dose of 20 mg for up to 3 months has shown good results in randomized and non-randomized trials. Regression of gynecomastia is seen in up to 80% of patients [16]. However, the available data on tamoxifen stems from few studies with very small case numbers [17]. Adverse side effects, including epigastric distress

and post-traumatic deep vein thrombosis, are rarely reported [18]. The use of anastrozole, an aromatase inhibitor, is not recommended as it did not show more effectiveness than placebo in boys with pubertal gynecomastia [19].

Prostate cancer patients represent a special group receiving antiandrogenic therapies with a high risk of iatrogenic gynecomastia. Tamoxifen or even radiotherapy can reduce gynecomastia in these patients [20, 21].

Low-dose irradiation mostly in single fractions (12–15 Gy) could be used as prophylaxis to decrease the risk of antiandrogen-induced gynecomastia [22].

If conservative pharmacologic therapy attempts are to be considered, it should be noted that hypertrophic glandular tissue becomes irreversibly fibrotic by way of remodeling after no more than 12 months. This fibrous tissue cannot be removed conservatively and proceeding with surgical management must be considered [23].

The indication for surgical therapy is based on the patient's suffering, including psychosocial stress and pain as well as cosmetic distortion [24]. The aim of all surgical procedures is to remove the hypertrophic fibrotic glandular tissue and to reestablish the male breast shape. Therapeutic techniques include breast tissue resection, liposuction, and combined techniques. From stage III onwards, reduction mammoplasty should be explored taking into

Fig. 12. Algorithm for the evaluation and treatment of gynecomastia (modified from [6, 11, 28, 30]).

consideration the extent of the hypertrophic tissue and the expertise of the surgeon (table 3) [25]. For milder forms, the periareolar edge cut to the mastectomy can suffice (figs. 8, 9). In the case of surplus skin, the skin envelope should be reduced using techniques such as the skin reduction procedure developed by Benelli [26] (fig. 10) or mastectomy with repositioning of the nipple developed by Kornstein [27] (fig. 11). Since open surgical procedures can produce unsightly scarring, a scar-reducing technique was developed by Bailey et al. [28]. Liposuction is used with a ‘pull-through’ technique to remove the glandular tissue without additional incision; using a Kocher clamp, the tissue is grasped and pulled out [29].

Excess skin is the limiting factor for this technique. Due to the weak data, no recommendation can be made with regard to the best surgical approach [30].

Overall, good preoperative planning leads to good cosmetic results with high patient satisfaction and low complication rates (fig. 12).

Disclosure Statement

The author has no conflict of interest.

References

- Narula HS, Carlson HE: Gynaecomastia – pathophysiology, diagnosis and treatment. *Nat Rev Endocrinol* 2014;10:684–698.
- Lanitis S, Starren E, Read J: Surgical management of gynaecomastia: outcomes from our experience. *Breast* 2008;17:596–603.
- Braunstein G: Gynecomastia. *N Engl J Med* 2007;357:1229–1237.
- Diamantopoulos S, Bao Y: Gynecomastia and premature thelarche: a guide for practitioners. *Pediatr Rev* 2007;28:e57–68.
- Ladizinski B, Lee KC, Nutan FN, Higgins HW 2nd, Felderman DG: Gynecomastia: etiologies, clinical presentations, diagnosis, and management. *South Med J* 2014;107:44–49.
- Rohrich RJ, Ha RY, Kenkel JM, Adams WP Jr: Classification and management of gynecomastia: defining the role of ultrasound-assisted liposuction. *Plast Reconstr Surg* 2003;111:909–923; discussion 924–925.
- Rew L, Young C, Harrison T, Caridi R: A systematic review of literature on psychosocial aspects of gynecomastia in adolescents and young men. *J Adolesc* 2015;43:206–212.
- Johnson RE, Murad MH: Gynecomastia: pathophysiology, evaluation, and management. *Mayo Clin Proc* 2009;84:1010–1015.
- Nordt C, Divanta A: Gynecomastia in adolescents. *Curr Opin Pediatr* 2008;20:375–382.
- Bowers SP, Pearlman NW, McIntyre RC Jr, Finlayson CA, Huerd S: Cost-effective management of gynecomastia. *Am J Surg* 1998;176:638–641.
- Morcos RN, Kizy T: Gynecomastia. When is treatment indicated? *J Fam Pract* 2012;61:719–725.
- Evans GF, Anthony T, Turnage RH, et al: The diagnostic accuracy of mammography in the evaluation of male breast disease. *Am J Surg* 2001;181:96–100.
- Baumann K, Pursche T: Congenital and developmental abnormalities of the breast; in Jatoi I, Rody A (eds): *Management of Breast Diseases*. Basel, Springer, 2016, pp 41–55.
- Mosenkis A, Townsend RR: Gynecomastia and antihypertensive therapy. *J Clin Hypertens (Greenwich)* 2004;6469–6470.
- Pitt B, Remme W, Zannad F, et al.; Eplerenone Post-Acute Myocardial Infarction Heart Failure Efficacy and Survival Study Investigators: Eplerenone, a selective aldosterone blocker, in patients with left ventricular dysfunction after myocardial infarction. *N Engl J Med* 2003;348:1309–1321.
- Hanavadi S, Banerjee D, Monypenny IJ, Mansel RE: The role of tamoxifen in the management of gynecomastia. *Breast* 2006;15:276–280.
- Johnson RE, Kermott CA, Murad MH: Gynecomastia – evaluation and current treatment options. *Ther Clin Risk Manag* 2011;7:145–148.
- Ting ACW, Chow LWC, Leung YF: Comparison of tamoxifen with danazol in the management of idiopathic gynecomastia. *Am Surg* 2000;66:38–40.
- Plourde PV, Reiter EO, Jou HC, et al: Safety and efficacy of anastrozole for the treatment of pubertal gynecomastia: a randomized, double-blind, placebo-controlled trial. *J Clin Endocrinol Metab*. 2004;89:4428–4433.
- Di Lorenzo G1, Autorino R, Perdonà S, De Placido S: Management of gynecomastia in patients with prostate cancer: a systematic review. *Lancet Oncol* 2005;6:972–979.
- Autorino R, Perdonà S, D'Armiento M, De Sio M, Damiano R, Cosentino L, Di Lorenzo G: Gynecomastia in patients with prostate cancer: update on treatment options. *Prostate Cancer Prostatic Dis* 2006;9:109–114.
- Widmark A, Fossa SD, Lundmo P, et al: Does prophylactic breast irradiation prevent antiandrogen-induced gynecomastia? Evaluation of 253 patients in the randomized Scandinavian trial SPCG-7/SFUO-3. *Urology* 2003;61:145–151.
- Bannayan GA, Hajdu SI: Gynecomastia: clinicopathologic study of 351 cases. *Am J Clin Pathol* 1972;57:431–437.
- Ordaz DL, Thompson JK: Gynecomastia and psychological functioning: a review of the literature. *Body Image* 2015;15:141–148.
- Wolter A, Scholz T, Diedrichson J, Liebau J: Surgical treatment of gynecomastia: an algorithm (Article in German). *Handchir Mikrochir Plast Chir* 2013;45:73–79.
- Benelli L: A new periareolar mammaplasty: the 'round block' technique. *Aesthetic Plast Surg* 1990;14:93–100.
- Kornstein AN, Cinelli PB: Inferior pedicle reduction technique for larger forms of gynecomastia. *Aesthetic Plast Surg* 1992;16:331–335.
- Fentiman IS: Managing male mammary maladies. *Eur J Breast Health* 2018;14:5–9.
- Bailey SH, Guenther D, Constantine F, Rohrich RJ: Gynecomastia management: an evolution and refinement in technique at UT Southwestern Medical Center. *Plast Reconstr Surg Glob Open* 2016;4:e734.
- Fagerlund A, Lewin R, Rufolo G, et al: Gynecomastia: a systematic review. *J Plast Surg Hand Surg* 2015;49:311–318.