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Male breast hypertrophy - a review of modern methods of treatment

Rafał Wójcik[1,2], Katarzyna Adamczyk[3], Dorota Adamczyk[3], Krzysztof Kozak[1,2], Maciej Czerwonka[1,2], Mateusz Dziedzic[4], Barbara Madej–Czerwonka[1,2]

[1] Department of Human Anatomy of the Medical University of Lublin, Poland

[2] Breast Surgery Department of the Cardinal Stefan Wyszyński's Regional Specialistic Hospital in Lublin, Poland

[3] Student, Medical University of Lublin, Poland

[4] General Surgery Department of the Cardinal Stefan Wyszyński's Regional Specialistic Hospital in Lublin, Poland

ABSTRACT

Gynecomastia is a benign enlargement of the mammary gland in males. Nowadays it is a common disorder of all ages, including newborns, adolescents and adults. It may be bilateral

or unilateral enlargement of the breast. Gynecomastia may be a severe problem in adolescents resulting in development of psychological disorders. Evolution of surgical treatment options, depending on the degree of breast hypertrophy advancement, brought significant improvement in aesthetic effect and patient's quality of life. This paper presents the development of pharmaceutical and surgical treatment technics. The manuscript proposes the optimal methods of clinical approach to the patients with an enlargement of the breast.

KEYWORDS

Male, breast, gynecomastia, surgery, surgical treatment, breast enlarment.

INTRODUCTION

Gynecomastia is an enlargement of one or both of the mammary glands in males because of benign hyperplasia of the glandular tissue. Sometimes, it is accompanied by proliferation of adipose tissue [1]. Breast hypertrophy may occur over the course years. It concerns boys at the age of puberty as well as the men in adolescence and advancing years.

Mammary glands arise from apocrine gland buds and are the largest skin glands. They consist of a glandular tissue, fat tissue, connective tissues, nerves, blood and lymph vessels. [2,3].

On top of the gland, slightly below the center of the breast, there is the papilla, which protrudes upwardly and laterally. Areola is located around the papilla and is characterized by darker coloration resulting from the accumulation of melanin. Areolar area is defined by an uneven surface formed by a plurality of apocrine glands so called Montgomery's glands. Mammary gland is formed of the radially located petals, separated from connective tissue and divided into lobules [4,5,6].

THE PURPOSE OF PAPER

The aim of this paper is to collect and determine modern methods of treatment of male breast hypertrophy.

CAUSES OF GYNECOMASTIA

Pathomechanism of gynecomastia results from the imbalanced ratio of free estradiol to free testosterone in the blood. It may be caused by increased synthesis of estrogen and sex steroid binding protein, decreased androgen synthesis and metabolism of the released estrogen and androgen. Gynecomastia is sometimes a consequence of an excessive sensitivity of the breast tissue to estrogen, an androgen receptor inherent defect or a locally increased aromatase activity. In addition, there are many drugs with antiandrogenic activity. These include, among others, spironolactone, ketoconazole, omeprazole or ranitidine.

Breast hypertrophy can be physiological as well as pathological. Physiological swollen nipples in newborns is found in 60-90% of children. The biggest increase occurs on the 10th day of life. In addition, the nipple from day 3 may emits colostrum-like content. Described symptoms are caused by the presence of maternal estrogen and prolactin. At that time, nipples should be protected from infection. However, at newborn gynecomastia, treatment is not usually required [7].

Physiological gynecomastia also occurs in boys at the age of puberty. In this group, it concerns up to 75% of boys. Symptoms should subside spontaneously within 2-3 years. In addition, the physiological hypertrophy of the mammary gland is present in elderly men. It results from hormonal changes and increase in fat tissue.

Gynecomastia is sometimes confused with pseudogynecomastia (lipomastia). However, pseudogynecomastia is not result from hypertrophy of the mammary gland but from excess of body fat. To differentiate we can use the physical examination and ultrasound. In patients with gynecomastia, in the central part of the breast, hard cortical tissue is located. It does not occur in patients with pseudogynecomastia [8]. In addition, ultrasound can extract individual elements of the breast, due to the difference in echogenicity. Adipose tissue in ultrasound is hypoechogenic compared to fibrous tissue, which is hyperechogenic. In contrary, normal glandular tissue exhibits intermediate echogenicity [9].

Mammary gland hyperplasia may be a serious problem, especially among young men. Psychological development disorders, resulting from gynecomastia mostly concern the boys in the age of puberty. During puberty it comes to formation of the self-esteem, body image and gender identity. According to a study group of 32 boys aged 13-17 years-old with gynecomastia, 92% admitted that they were publicly ridiculed, 72% confirmed the presence of depressive symptoms, while 69% felt less self-esteem. Treatment of gynecomastia can significantly improve the functioning of patients and improve the quality of life [10].

Idiopathic	Obesity Physiologic Puberty Old age
Endocrine	Hypogonadism, Klinefelter syndrome Cushing syndrome, Adrenal hyperplasia Hypothyroid, Hyperthyroid Pituitary failure
Neoplasms	Adrenal Testis Pituitary
Systemic diseases	Renal failure Cirrhosis Adrenal
Drug-induced	Estrogens, androgens Spironolactone, cimetidine, ketoconazole Ranitidine, flutamide Amiodarone, digoxin, nifedipine Reserpine, verapamil Alcohol, heroin, marijuana

Table 1. Causes of Gynecomastia

METHODS OF TREATMENT

The method of treating gynecomastia depends on the cause of the breast hyperplasia. In vast group of patients spontaneous remission may occur. Therefore, physicians very often assume the wait-and-see attitude. In patients with hormonal disorder quite often pharmacotherapy can be used. The same effects are also seen in patients with idiopathic gynecomastia. The effectiveness is higher in the active phase of the disease. The drugs used in the treatment of hypertrophy of the mammary gland are: testosterone, dihydrotestosterone, danazol, clomiphene, tamoxifen and raloxifene.

Testosterone is used in gynecomastia caused by hypogonadism. However, paradoxically, this drug may induce gynecomastia. Testosterone is a substrate of aromatase, which allows the conversion of androgens to estrogens. The dihydrotestosterone has an advantage over testosterone due to its lack of aromatization potential. Therefore, the application of testosterone is nowadays limited [11]. On the other hand, danazol inhibits pulsatile gonadotropin secretion, thereby inhibiting the synthesis of the pituitary luteinizing hormone and FSH (follicle-stimulating hormone). Danazol binds to estrogen receptors, progesterone, androgen and corticosteroid. It shows antiestrogenic, anabolic and androgenic activity. In addition, by suppression of SHBG (sex hormone binding globulin), increases the concentration of free testosterone in blood [12].

Clomiphene, tamoxifen and raloxifene belong to the group of selective estrogen receptor modulators. Depending on the target tissue may have agonist or antagonist activities. Clomiphene selectively inhibits the binding of estradiol by specific receptors located in the hypothalamus, increasing the secretion of gonadotropin and testosterone. Used in large doses has antiestrogenic action. In patients with gynecomastia, it has the efficacy of tamoxifen. This drug has antagonist activity to estrogen receptors in breast. Tamoxifen also reduces the pain associated with gynecomastia [13,14,15]. Another drug in this group - raloxifene is better tolerated by patients. According to Lawrence et al. studies is also more effective than tamoxifen [16].

In more severe cases of gynecomastia, resistant to pharmacological treatment, the option is surgery. There are many surgical techniques used depending on the degree of advancement of male breast hypertrophy.

Surgical treatment technics of gynecomastia:

1. extra-areolar skin incisions

2. semicircular intra-areolar incision / periareolar incision
3. suction-assisted lipectomy (SAL)
4. ultrasound-assisted liposuction (UAL)
5. power-assisted liposuction (PAL)
6. pull-through technique

Bannayan and colleagues proposed gynecomastia classification based on three histological types: florid, fibrous, and intermediate [17]. The florid type is defined by ductal proliferation and hyperplasia, with edematous stroma. The fibrous type involves more stromal fibrosis and less ducts. When it comes to the intermediate type of gynecomastia, it shows mix of fibrous and ductal hyperplasia.

The current knowledge showed the concept that gynecomastia is not a risk factor of breast cancer [18]. On the basis of imaging or clinical examination gynecomastia cannot be differed with male breast cancer. The patient must undergo fine-needle aspiration or core biopsy. Preferred method is core biopsy because it allows to diagnose an invasive breast cancer.

In process of selecting the method of surgical treatment, classifications based on the clinical features of gynecomastia may be helpful:

Simon et al. proposed a four-grade classification of gynecomastia [19]

Grade 1	Small enlargement, with no skin excess
Grade 2a	Moderate enlargement, with no skin excess
Grade 2b	Moderate enlargement with minor skin excess
Grade 3	Marked enlargement with excess skin

Rohrich et al. presented a similar classification of gynecomastia severity [20].

Grade I	Minimal hypertrophy (less than 250 g of breast tissue) without ptosis
IA	primarily glandular
IB	primarily fibrous
Grade II	Moderate hypertrophy (between 250–500 g of breast tissue) without ptosis
IIA	primarily glandular
IIB	primarily fibrous
Grade III	Severe hypertrophy (more than 500 g of breast tissue) with grade I ptosis (glandular or fibrous)
Grade IV	Severe hypertrophy with grade II or III ptosis (glandular or fibrous)

Webster was the first physician who described modern technique of surgical treatment of gynecomastia. He implemented semicircular intra-areolar incision. Minimal invasive techniques were developed since 1980s [21, 22]. According to many author, a suction-assisted lipectomy (SAL) and ultrasound-assisted liposuction (UAL) [20] leave smaller scars in comparison to classic excisional techniques. Authors own experience shows satisfying cosmetic results following semicircular intra-areolar incision with low complication rates. The pull-through technique was proposed for the first time by Morselli et al [23] in 1996. This technique for the minimal invasive management of gynecomastia consist in pulling the lesion thought the small incision.

Fibrous lesions or solid stage 1 or 2a (Simon) are mostly surgically removed using intra-areolar incision. In some of these cases an ultrasound-assisted liposuction (UAL) may be preferred.

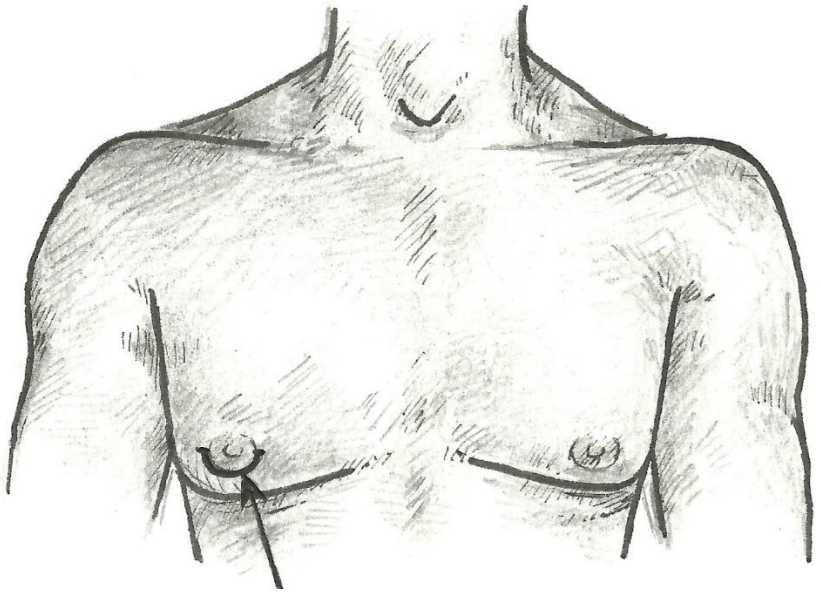

Figure 1. Semicircular intra-areolar incision (Adamczyk K.)

When the patient has a gynecomastia that contain glandular tissue, fatty tissue or mix of both with Simon 1 or 2a grade, it should be treated with a minimal invasive liposuction techniques, e.g. ultrasound-assisted liposuction (UAL) or power-assisted liposuction (PAL). In case of liposuction failure, the surgeon may proposed pull-through technique. The breast tissue is pulled out and removed until the wanted shape is reached.

If the patient developed Simon grade 2b gynecomastia, a minimal invasive technique as well as classic incision might be performed. In most cases there is no need to remove skin at the first surgery. The patient right after the operation is requested to use compression vests. The skin resection might be considered if there is no improvement after 12 months.

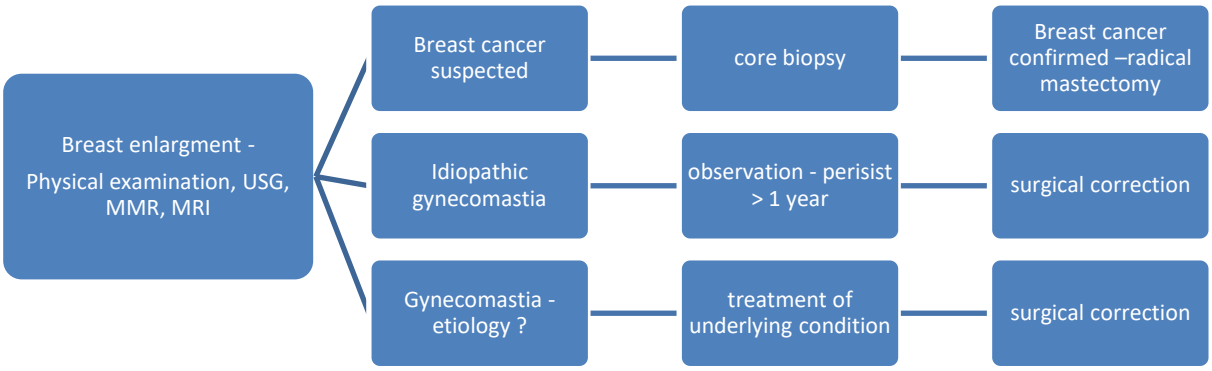

Figure 2. Surgical treatment algorithm of gynecomastia (Wójcik R.)

In the severe cases of gynecomastia (Simon grade 3), skin resection is always required. There is large variety of plastic methods of treatment e.g. the nipple-areolar complex transposing, omega incision, circumareolar incision surrounding the half of the areola, inframammary incision or concentric circle incision. The method of surgical technique is always selected on the experience and preference of the surgeon.

CONCLUSION

Gynecomastia as a common affliction in males, occurs widely in the world population. Breast hypertrophy should not be underestimate by the physicians. Physiological gynecomastia, especially in adolescents, may lead to development of psychological disorders, which deserve careful consideration. The pharmaceutical or surgical treatment require an individual approach and deliberated informed consent of patient. Based on the literature we proposed diagnostic pathways and classifications using clinical features of gynecomastia. Described treatment options may be helpful to general practitioners as well as for plastic surgeons or surgical oncologists. Tailored therapy need to be still evaluated and developed to achieve optimum aesthetic and psychological effect.

References

1. Szczeklik A, Gajewski P. Interna Szczeklika – Podręcznik chorób wewnętrznych 2014. 2014; 2: 1315

2. Bochenek A, Reicher M. Anatomia człowieka. 1997; 5: 203

3. Banaszkiewicz A, Żukowska-Rubik M. Anatomia i morfologia gruczołu piersiowego. W: Karmienie piersią. Podręcznik pod redakcją Nehring-Gugulskiej M i Żukowskiej-Rubik M. KUKP 2006

4. Ramsay DT, Kent JC, Owens RA and Hartmann PE. Ultrasound Imaging of Milk Ejection in the Breast of Lactating Women. Pediatrics. 2004; 113: 361-367.

5. Kent JC, Ramsay DT, Hartmann RA, Hartmann PE. Anatomy of the lactating human breast redefined with ultrasound imaging. J Anat. 2005; 206(6): 525-34.

6. Geddes D. Gross Anatomy of the Lactating Breast. W: Hale T, Hartman P. Textbook of Human Lactation. Hale Publishing, L.P. 2007.

7. Bręborowicz GH. Położnictwo i Ginekologia. Wydawnictwo Lekarskie PZWL. 2005; 2: 183

8. Braunstein GD. Gynecomastia. N Engl J Med. 1993; 328: 490–495.

9. Venta LA, Dudiak CM, Salomon CG, Flisak ME. Sonographic evaluation of the breast. Radiographics. 1994; 14: 29–50

10. Derkacz M, Olajossy M. Czy pacjenci z fizjologiczną ginekomastią okresu pokwitania mogą wymagać pomocy psychiatry i psychologa?. Forum Medycyny Rodzinnej. 2015; 2: 152-154.

11. Nuttall FQ. Gynecomastia as a physical finding in normal men. J Clin Endocrinol Metab. 1979; 48(2): 338-340.

12. Czajka I, Zgliczyński W. Gynecomastia-pathogenesis, diagnosis and treatment. Endokrynologia Polska. 2005; 56(3): 269-283.

13. Parker LN, Gray DR, Lai MK, Levin ER. Treatment of gynecomastia with tamoxifen: a double-blind crossover study. Metabolism. 1986; 35(8): 705-708.

14. Boccardo F, Rubagotti A, Battaglia M, Di Tonno P, Selvaggi FP, Conti G, et. al. Evaluation of tamoxifen and anastrozole in the prevention of gynecomastia and breast pain induced by bicalutamide monotherapy of prostate cancer. J Clin Oncol. 2005; 23(4): 808-815.

15. Perdonà S, Autorino R, De Placido S, D'Armiento M, Gallo A, Damiano R, et al. Efficacy of tamoxifen and radiotherapy for prevention and treatment of gynaecomastia and breast pain caused by bicalutamide in prostate cancer: a randomised controlled trial. Lancet Oncol. 2005; 6(5): 295-300.

16. Lawrence et al. Beneficial effects of raloxifene and tamoxifen in the treatment of pubertal gynecomastia. J Pediatr. 2004; 145(1): 71-6

17. Bannayan GA, Hajdu SI. Gynecomastia: clinicopathologic study of 351 cases. Am J Clin Pathol. 1972; 57(4): 431–437

18. Fentiman IS, Fourquet A, Hortobagyi GN. Male breast cancer. Lancet. 2006; 367(9510): 595–604

19. Simon BE, Hoffman S, Kahn S. Classification and surgical correction of gynecomastia. Plast Reconstr Surg. 1973; 51(1): 48–52.

20. 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; 111.2: 909-925.

21. Webster JP. Mastectomy for gynecomastia through a semi-circular incision. Ann Surg. 1946; 124: 557.

22. Courtiss EH. Gynecomastia: analysis of 159 patients and current recommendations for treatment. Plast Reconstr Surg. 1987; 79:740.

23. Morselli PG. “Pull-through”: a new technique for breast reduction in gynecomastia. Plast Reconstr Surg. 1996; 97(2): 450–454.