… and boys will be girls.
It's a mixed up, muddled up, shook up world,
… Lola, *The Kinks*, 1973

GYNECOMASTIA: FEMALE BREASTS IN YOUNG MALES

Howard W. Siegel

ABSTRACT

Males sometimes experience the swelling and enlargement of an area around their nipples. The occurrence of gynecomastia is more common than generally known and affects boys' and young adolescent males' lives emotionally and socially as well as physically. Understanding the causes of "female breasts" in males is important in order to help boys receive the correct information about their condition and the proper treatment for it.

Keywords: gynecomastia, female breasts in boys, hormones, testosterone, estrogens, plastic surgery

THE SYNDROME

Gynecomastia, the medical term for the development of breast tissue in men, comes from the Greek words *gyneco* (female) and *mastia* (breast). It usually appears at three stages of life: neonates, adolescents, and the aged for reasons to be discussed. Typically, it is bilateral but unilateral cases occur. The incidence varies greatly according different studies. Suffice it to say that the condition is more common than one would first think. It appears in all races.

The breast is one of the human body's many apocrine glands. These glands have distinct ducts as opposed to the endocrine glands which drain directly into the blood stream. Apocrine glands have a tree-like structure of small sacs (leaves) and ducts (branches) which coalesce into a more central duct and then drain to the skin surface in the nipple. Breast glandular tissue is present in both men and women. In males a small amount of breast tissue is normally distributed in a layer below the skin and over the chest muscles (Fig. 1).

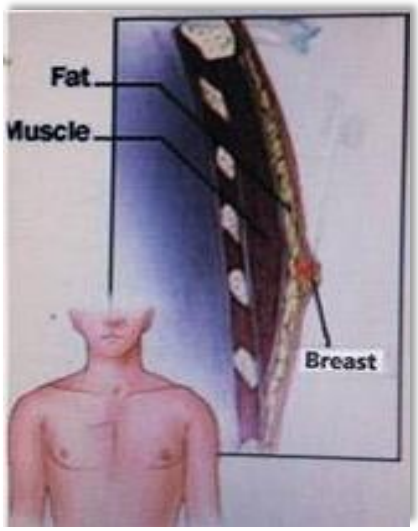

Figure 1. Normal male breast tissue can be seen in the very small region just under the nipple.

The duct structure is minimal and the gland is inactive. In some males, however, the breast increases in size, density and duct structure under hormonal influences at pubescence [Fig. 2].

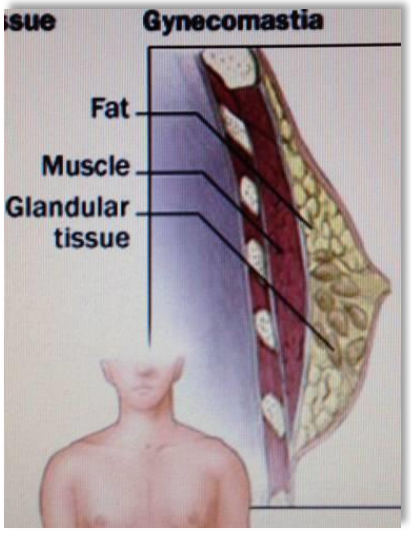

Figure 2. Enlarged male breast tissue in gynecomastia

Breast development is chiefly responsive to the sex hormones, estrogen and testosterone, which are present in both men and women albeit at different levels at different times in life. It is thought that the ratio of estrogen to testosterone is a major causative factor because as previously mentioned gynecomastia presents most frequently at three phases of life: in the neonatal period when there may are high maternal estrogen levels; in the peripubertal period when sexual hormones are in flux, and again at senescence when testosterone levels decrease due to reduced testicular function or anti-androgen medicines are used for the treatment prostate cancer.

Many drugs, both licit and illicit may cause gynecomastia (see below). It also appears in some relatively rare hormonal secreting tumors, many genetic disorders, and often in conditions of ambiguous sexual organ structure. Awareness, identification and treatment of these underlying conditions is essential. In the light of the important focus on breast cancer today, it should be stressed that gynecomastia itself is not a malignancy, i.e., it has no propensity to metastasize (spread to distant sites) and given our current knowledge has no tendency to change from benign to malignant tissue. However, there have been rare cases of an occult primary malignant breast tumor occurring in association with gynecomastia.

Breast cancer in males is rather rare. However, as one wise physician said, "*Rare diseases are quite common in those who have them, so good doctors need to be aware of them".* Therefore,

when there is an index of suspicion a careful work-up is indicated and techniques are available to confirm or rule out such tumors. As an example, assume a patient with a left unilateral firm nodular gynecomastia and a palpable lymph node can be felt in the left armpit. Here, a prudent surgeon would consider a possible primary malignant breast tumor which has spread and order appropriate imaging and biopsies to obtain a clear diagnosis in order to render proper treatment.

CAUSATIVE FACTORS

As has been mentioned, the most common presentation of gynecomastia occurs in peripubertal period likely due to sex hormone flux [Fig. 3].

Figure 3. Classic adolescent gynecomastia

This type often resolves spontaneously; however, it may take as long as two years to return to a fully normal male physique. Unfortunately, it is difficult to predict which cases will resolve. Perhaps the most prudent course is to delay and closely follow the patient for signs of early regression, which, if it continues at a satisfactory rate, may make surgery unnecessary.

Psychosocial issues are important considerations at a time of emerging sexuality. Other factors which mitigate toward early surgery include significant body image distortion as well as the degree and duration of deformity, pain, tumors, and co-morbid conditions.

Other causative factors include a wide range of drugs. The list is extensive and a detailed discussion is beyond the scope of this article (Nuttall et al. 2015). However, it is useful to

mention at least some of the common drug classes which can cause gynecomastia. Not every drug in each category is involved. Interested readers can get more information or at reliable sites such as WebMD™ [1]. Chronic marijuana, heroin, and amphetamine use are associated with a high incidence of gynecomastia in adolescents and adult males. Estrogens, anti-androgens such as Flomax and Hytrin for prostate enlargement, anabolic steroids, some psychiatric medicines (e.g., Risperidal, phenothiazene tranquilizers, tricyclic antidepressants), many anticancer chemotherapeutic agents, some cardiac medications, and antifungals may be contributary. It is not well known to what extent cessation of any of these drugs will lead to regression, if at all. Liver damage from hepatitis, parasitic diseases, and chronic alcohol consumption, because a diseased liver can no longer breakdown estrogen, is also associated with gynaecomastia.

TREATMENT

Many methods have been devised for the treatment of gynaecomastia. Some work has been done and is ongoing using anti-estrogen drugs such as Tamoxifen and Raloxifine in an effort to find treatments which avoid surgical intervention. Tamoxifen has been used in a few small limited uncontrolled studies with some success. More recently some work with Danazol has been done. To date, these studies are preliminary and more work needs to be done to fully evaluate them. Hence they are only approved only for "*off -label*[2]" use by the Food and Drug Administration. Surgery remains the gold standard for treatment.

When advisable, a number of different operative techniques have been developed. These operations usually fall in the province of plastic surgeons. Not only is it important to minimize scarring, but careful attention to restoring the normal contours of the male body is paramount. One does not wish to operate for a deformity and leave another in its place.

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1 WebMD https://www.webmd.com/

2 The "off-label" designation allows doctors to prescribe a medication for an approved study but the FDA has not yet approved its use for inclusion in its official list of indications.

In most techniques an incision is made along the outer edge of the areola.[1] The skin with its subcutaneous fat layer is elevated above the breast mass. Breast tissue is freed at its edges and dissected free of its deep attachments, staying above the chest muscles. Depending on its size an attempt is made to remove the entire gynecomastia through the incision. This is not always possible when the breast mass is very large. In these cases the tissue may have to be segmented. This can be problematic, as it can lengthen the operative time and contribute to intra-operative and/or post-operative bleeding, an important complication to be considered and prevented. After the breast tissue has been removed, any bleeding is carefully controlled and the incision closed with very fine self-absorbing sutures. Occasionally, small drains are put in place and removed after 24 to 48 hours. A sterile compression dressing is applied. The patient is monitored in the recovery room. Post-operative instructions are given and patients are usually discharged the same day. This type of surgery can be done under local anesthesia with monitored twilight sedation. General anesthesia is also an option depending upon individual case indications and preferences. This surgery should be done in a hospital or in a certified office facility (Salisbury 2007).

With the advent of vacuum liposuction body contouring techniques, many surgeons do not use the periareolar incision initially developed and popularized by Webster (1946). Rather, they employ a closed vacuum suction cannula to remove the breast tissue. Here, only small puncture incisions are needed. This is a useful approach in some but not all cases. When the tissue is soft, chiefly glandular or fatty, it works well. But, when there is an abundance of thick, tough fibrous tissue in the breast it may be difficult to remove using suctioning and an open technique would seem preferable. The same problem exists in cases of firm nodular gynecomastia located just below the nipple. These often adhere to the skin and require passing the suction cannula very close to the skin and there is some risk of damaging the small blood vessels which nourish the skin. If this occurs, the nipple and surrounding areola tissue may die. This is a true surgical catastrophe and will require a complex reconstructive procedure in the future. Additionally, as this technique is not under direct visual control the extent of tissue removal must be judged by touch. Occult bleeding may occur. Removing too little breast tissue may leave the patient with the same problem, while removing too much can allow the skin to scar down to the muscle layer producing an obvious flat non-mobile area. Both situations produce sub-optimal cosmetic results. In spite of these possible problems, this technique has

validity and has yielded excellent results in the hands of experienced surgeons.

If the gynecomastia is massive there will be excess skin after removal which must be surgically excised and contoured. This may add some additional scarring. On the positive side, this situation is uncommon and most patients tolerate the scars better than their original problem.

Another operative method, the "pinwheel technique" developed by David T.W. Chiu has been described in the plastic surgery literature (Chiu and Siegel 1999). This technique combines a periareolar incision, repositioned in such a way as to minimize interference with the delicate sensory nerves to the nipple. Specialized pincer clamps are sequentially placed in a circumferential fashion around the periphery of the breast mass forming a pinwheel. By grasping the clamps breast tissue can be mobilized in any direction. There is excellent exposure of the margins between normal subcutaneous tissue and the breast can be dissected free. Bleeding is easily visualized and controlled. This technique also prevents removing too much or not enough breast tissue both of which are to be avoided as this can lead to asymmetries. Complete excisions of large gynecomastia's as a single block have been possible using this technique. The tissue removed from each side can be compared by weight and volume. Finally, it allows the surgeon to place a cushioning fat pad to avoid sunken skin or scarring to the muscle which leads to poor body contour and is a tell-tale sign of previous surgery. This operation has been used since 1993 with very good results and minimal complications. [Fig.4].

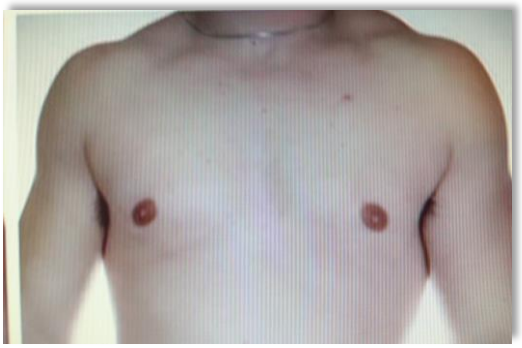

Figure 4. An excellent post-operative result following pinwheel surgical resection of the adolescent gynecomastia

COMPLICATIONS

All surgery and anesthesia have known risks and potential complications that include suboptimal results which occur even in the most competent hands. These are never trivial, especially if you are the patient. All skin wounds, surgical or otherwise heal by scarring. The incision at the perimeter of the areola should be minimal and hard to detect if you are not looking for it. Occasionally, however, it becomes thick and itchy. This can be treated or surgically revised.

Overall, the most common complication is bleeding under the skin. It is rare after the first two days, but very treatable when detected early while the blood is still liquid. It can then be drained or suctioned. If delayed the blood may form a clotted firm mass which is much more difficult to remove. Infections can occur, but are not common. Later cosmetic complications include lumpiness which usually resolves with pressure garments and massage. A more severe problem is a circular skin depression in the region of breast removal. This is a result of removing too much soft cushioning tissue over the breast gland. Consequently the thin skin becomes scarred down to the muscle layer and is immobile. When severe, this deformity has been colloquially termed a “donut hole deformity”. It is difficult to correct and usually requires revisional surgery.

Perhaps the most serious complication is necrosis (death) of the nipple and/or areola tissue due to disruption of blood vessel supply. Fortunately, this particular situation is rare. It requires major reconstructive surgery, which usually falls to plastic surgeons.

SUMMARY

Gynaecomastia is a distressing non-malignant condition affecting young males and has a number of different causes. It can resolve spontaneously, but when it does not, many surgical are treatments are available. The importance of choosing a surgical procedure which best addresses the particular characteristics of each individual case as well as an experienced board certified surgeon is well advised.

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Howard W. Siegel, MD, is a retired plastic surgeon who trained at Yale University. He and David Chu, MD, pioneered in the surgical treatment of gynecomastia and other procedures.

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