Topics in plastic surgery of the breast
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GYNECOMASTIA SURGERY IN THE NETHERLANDS: WHAT, WHY, WHO, WHERE...
ABSTRACT

BACKGROUND: Gynecomastia, breast enlargement in men, is common in all age groups. It is operated on by Plastic Surgeons, General Surgeons and Pediatric Surgeons. It is therefore possible that there is a difference in the populations treated, the indications for surgery and the management used by the different practitioners. We performed a survey in order to assess the approach to treatment of gynecomastia by the different disciplines.

METHOD: An electronic survey questionnaire was sent to members of the Dutch societies of Surgery, Pediatric Surgery and Plastic Surgery. We received 105 responses from plastic surgeons, 95 from general surgeons, and 15 from pediatric surgeons, representing respective response rates of 38.7%, 23.8%, and 42.8%.

RESULTS: Plastic surgeons operated on gynecomastia most frequently. The diagnostic criteria and work up were similar for all disciplines, although general surgeons used more imaging. There was a difference in the side operated on. General surgeons and pediatric surgeons operated mainly on unilateral cases (74% and 52%) while plastic surgeons operated mainly on bilateral cases (85%). Pharmaceutical treatment with Tamoxifen was reported only by general surgeons (13%). All disciplines used mainly the periareolar incision. Plastic surgeons reported more often the use of other surgical approaches as well as adjunctive liposuction and they did not always submit tissue for pathological examination. Perioperative antibiotics, drains, and pressure garments were not always used. All disciplines agreed that the most common complication was bleeding followed by seroma, infection, insufficient results, inverted nipple and nipple necrosis.

CONCLUSION: This survey highlights some differences in the practice of gynecomastia surgery. The findings appear to point to the fact that the indications are different, being more esthetic in the case of plastic surgeons. The results of this survey are important in establishing the standard of care and may be helpful for setting guidelines.

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Submitted
GyNECOMASTIA SURGERY IN THE NETHERLANDS

INTRODUCTION

Gynecomastia (GM) is the term used to describe breast enlargement in men; it derives from the Greek γυνή (gyné) meaning “woman” and μαστός (mastós) meaning “breast”. It is a ubiquitous finding seen in all age groups with peaks in prevalence postnatally, during puberty and in the elderly [1, 2]. The reported prevalence between the ages of 10 and 16 is as high as 48.5% [3] with a peak incidence of 64.6% in boys between 14 and 14½ [4]. GM has been observed in up to 72% of hospitalized patients [5].

An increase in subareolar fat without enlargement of the glandular tissue, which is clinically similar to GM, is described as pseudo-GM. Pseudo-GM is more common in overweight patients.

GM can be painful. In addition, it may have an impact on body image leading to distress and embarrassment.

The development of GM is attributed to a hormonal imbalance. Pathological etiologies are also possible and need to be ruled out; these include congenital and endocrine disorders, tumors and medications as well as recreational drugs. GM may be bilateral or unilateral. Nevertheless most cases of GM are idiopathic.

The workup for patients with GM includes a thorough history and physical examination. Confirmation of adequate virilization is essential. The medical literature is equivocal about the necessity for ancillary tests such as blood tests and imaging [1, 2, 6-10].

In most cases GM does not require treatment. In cases of idiopathic pubertal GM reassurance and an explanation about the natural course of GM are usually sufficient since the GM is often transient [9]. If a specific cause of the GM is diagnosed and treatment is initiated during the initial phase, the breast hypertrophy may regress. It has also been suggested that GM may be treated using pharmacological agents. The use of agents such as androgens and Tamoxifen has been reported mainly in adults. Tamoxifen use has received the most attention in the medical literature and has also been reported for adolescents [11-14].

If GM lasts for over a year, medical treatment will be unlikely to achieve regression, and surgery may be required to correct it [15, 16].

The traditional surgical treatment for GM is a sharp excision of the mammary gland through a semicircular incision on the caudal margin of the areola [17]. Cases with skin redundancy may be managed by various techniques: liposuction may be used as the only modality or be used as an adjunct to other surgical techniques [1, 17]. Such operations can take place in different clinical settings. There are also different approaches to the post-operative management of GM.

Breast cancer in men is rare [18]; and tumors are rarely found in specimens from gynecomastia excisions [19].

GM is operated on by different disciplines; it is therefore possible that there is a difference between the surgical specialisms in the populations treated, the indications
for surgery and the management used. To assess whether that is indeed the case we performed a survey regarding the treatment of GM by the three disciplines that operate on it: plastic surgery (PLS), General Surgery (GES) and Pediatric Surgery (PDS).

Knowledge of who operates for GM and the different pre, peri and postoperative strategies can be useful for determining what the present standard of care is and development of guidelines for the surgical management of GM, as well as planning the allocation of healthcare resources.

MATERIAL AND METHODS

An electronic survey questionnaire was sent to members of the Dutch societies of Surgery, Pediatric Surgery and Plastic Surgery. The members received a link to the survey web site using the Qualtrics survey software (Qualtrics Provo, Utah, USA). It was not possible to identify the participating surgeons and it was not possible to send reminders in the case of non-response or incomplete response. Surgeons were offered the option to consent to being contacted for further information. If the surgeons stated that they did not perform GM surgery they did not have to answer questions on their own management of GM and they were directed to the end of the survey and asked if they had ever witnessed a case of malignancy in a patient operated on for GM.

The survey was mailed to 400 general / oncological surgeons, 271 plastic surgeons and 35 pediatric surgeons.

An English translation of the survey appears in Appendix 1.

We received 105 responses from PLS, 95 from GES, and 15 from PDS, representing respective response rates of 38.7%, 23.8%, and 42.8%.

RESULTS

Of the surgeons surveyed who responded, the majority operated on GM (PLS 93%, GES 85%, PDS 54%). PLS reported performing GM surgery more frequently than the surgeons from other disciplines. See Figure A.

The respondents from all disciplines practiced mainly in a university or teaching hospitals. Among the PLS there were more who worked in private clinics, but however only 4 worked exclusively in such a setting.

The preoperative work up was similar between the different disciplines GES were more inclined to use imaging, and stated more often that they always used ultrasound and mammography. See figure B.

The use of pharmacological therapy was reported only by GES, 13.2% of whom report prescribing tamoxifen.

The criteria that surgeons consider as indications for surgery are presented in Figure C.

Among the respondents 90.8% of PLS consider a Body Mass Index (BMI) of 30 kg/m² as the upper limit for performing surgery. For PDS this figure is 57.1% and
**Figure A.** Frequency of Gynecomastia surgery performed by the different disciplines

**Figure B.** Use of pre-operative work-up modalities

**Figure C.** Criteria Necessary for surgery
for GES 28.6%. The rest of the surgeons from all disciplines have a higher BMI cutoff or none at all.

PLS and GES most commonly operated for GM in daycare settings while PDS preferred using inpatient facilities. The data are presented in Figure D.

PLS reported performing mainly bilateral procedures (85% of cases). For GES the situation was different as only 26% of their procedures are bilateral, and for PDS half the procedures are bilateral. The data are presented in Figure E.

The preferred surgical approach of all disciplines was an excision via the periareolar incision. In addition, respondents from all disciplines had experience with the use of other techniques. PLS reported more often the use of multiple techniques.

![Figure D. Setting of the surgical procedure]

![Figure E. Side operated]
Adjunctive liposuction had been used by 86.7% of PLS, but only 6.8 % of GES and 14.3 % of PDS. The use of different surgical methods is reported in Figures F and G.

There were differences in the use of adjunctive measures. Preoperative antibiotics, drains, tumescent infiltration, and pressure garments are not always used. The use of antibiotics is more common among PDS, the other measures are part of the standard procedure mainly for PLS. The use of ancillary modalities is presented in figure H.

**Figure F. Techniques that have been used**

**Figure G. Surgical techniques commonly used**

**Figure H. Modalities that are always used**
All disciplines agreed that the most common complication was bleeding, followed by seroma, infection, insufficient results, inverted nipple and nipple necrosis.

GES and PDS reported that they always submitted the surgical material for pathological examination, whereas with PLS this was routinely done by only 74.4% and by 22.9% only if they believed there was an indication; 2.4% stated they never submitted material for pathology examination.

18 surgeons recalled having had a patient with a carcinoma in his pathology report. The surgeons surveyed had 3,420 practice years including a 6 year residency. This represents 1 case of GM in 190 practice years.

DISCUSSION

Despite the fact that GM is a common finding, (22,736 operations were reported in the US in 2012 [20]), it receives less attention than the management of female breast hypertrophy. This is also evidenced by the paucity of guidelines for the management of GM. We performed this study in order to “touch base” and assess what clinicians are doing as it may help to determine the current standard of care. Such knowledge could complement evidence based medicine when guidelines are being compiled.

When interpreting the data from the surveys it is important to take into account the weakness of the methodology – the responses reflected the subjective opinions and self-images of the respondents and not what they actually do. Secondly the survey depended on the willingness of the surgeons who received the questionnaire to complete and return it. A bias may be present in that surgeons who are interested in the subject of GM may have been more inclined to complete the survey.

Most of our respondents reported that they perform GM surgery, but only a minority do so frequently. In the case of oncological breast surgery there has been a requirement in recent years that surgeons perform a minimum number of operations per year in order to maintain their accreditation [21]. If such a requirement was applied to GM surgery one could claim that the standard of care is low. However, we must assume that most of the surgeons have sufficient experience and exposure treating female breasts. This is possibly not the case for pediatric surgeons. In addition GM surgery is considered by some not to be a complex operation. One of the reasons for the low number of surgeries performed may be the stricter reimbursement policies by health care insurers in recent years, which is curbing the number of surgeries.

The pre-operative assessment tended to be similar among disciplines. Most practitioners reported that they perform tests if deemed necessary. However, when asked which tests they always perform GES reported more use of imaging. This policy probably derives from GES’s experience with treating breast malignancies in females. The value of imaging in GM is limited and probably overused, as has been shown in previous studies [10].

The respondents were asked about the criteria they deem necessary as an indication for surgery. This issue is difficult to assess as it is strongly influenced by the criteria
imposed by the health insurers for reimbursement, and not only by the conditions that surgeons consider medically relevant. In addition, the decision is usually not made on the basis of one factor - it is dependent on the whole clinical situation and the patient's will.

GES tended to operate mainly in day care, while PDS tended to operate on inpatients. This may reflect the preferences of the physicians and the patients, as well as the availability of resources. The portion of procedures performed by PLS in day care is between that of GES and PDS; this may be due to the fact that PLS operate on all age groups as opposed to PDS who operate only up to age 18 and GES who operate from the age of 18 upwards.

The aspect in which the difference between the disciplines was striking was the side operated. PLS tended to operate mainly on bilateral cases while GES and PDS operated mainly on unilateral cases. Despite the fact that GM may often be unilateral, such cases are more frequently viewed as suspicious and will consequently be more often referred to and consequently treated by, GES and PDS. Bilateral cases are more often seen as esthetic and will be seen and treated more often by PLS. It is also possible that in cases of asymmetry PLS will be more inclined also to perform a contralateral procedure – not only to remove the surplus, but also to normalize the shape of the torso.

The more esthetic approach is also reflected in the choice of surgical method; PLS use various methods they are familiar with from the esthetic and reconstructive management of female breasts. This can also be seen in the more wide-spread use of tumescent anesthesia and liposuction among PLS, as well as the use of postoperative pressure garments.

The points mentioned above are similar to those previously described for a single institution in the Netherlands [22].

All disciplines made little use of antibiotics. This is the standard of care for most elective procedures in the Netherlands. Despite the trend in recent years to use fewer drains in surgery of the female breast [23], drains are still being used by 22% of PLS. The utility of drains in female breast reduction has been questioned and this is an aspect that merits further investigation in men.

GES and PDS always sent tissue for pathological examination, while PLS were more selective in the use of this examination. In cases of GM without any suspicion, the value of such an examination is limited. [19, 24] The reason for still submitting tissue for examination is probably habit, the experience of GES in treating malignancies of the female breast and the wish to avoid missing a serious diagnosis, but it is not evidence based.

It should also be mentioned that these findings reflect the situation in the Netherlands where there is a pressure to curb costs and implement evidence-based medicine, coupled with a lower pressure to perform defensive medicine as is unfortunately the case in North America.
CONCLUSION

This survey points to some differences in the practice of GM surgery. However, many questions remain open. A better understanding could possibly be achieved by concentrating the care of such cases and using of uniform guidelines combined with better data collection.

REFERENCES


APPENDIX 1
ENGLISH TRANSLATION OF THE SURVEY

Are you a specialist or a resident?
- Specialist
- Resident

What is your discipline?
- Plastic surgery
- General surgery
- Pediatric surgery

In what setting do you work?
- Academic hospital
- Teaching hospital
- General hospital
- Private clinic

How long have you been a specialist?

How often did you operate for gynecomastia in the last 2 years?
- Never / no longer
- Less than 5 cases per year
- 5-10 cases per year
- More than 10 cases per year

The following questions relate to the diagnostic work up. Which of the following do you use?

<table>
<thead>
<tr>
<th>Evaluation of sexual maturity / virilization</th>
<th>Always</th>
<th>If indicated</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination of the genitalia / testes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ultrasound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mammography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endocrine blood tests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endocrinology consultation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical photography</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of medicine and substance abuse</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Which of the following criteria are necessary for the decision to operate on a patient?

<table>
<thead>
<tr>
<th></th>
<th>Always necessary</th>
<th>In combination with other criteria</th>
<th>Not necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palpable gland</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Visible swelling</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Pain</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Psychological burden</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Do you have apply a maximum BMI to operating for gynecomastia?
- O <20
- O <25
- O <30
- O <35
- O <40
- O None

Do you treat gynecomastia with any of the following drugs?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamoxifen</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Raloxifene</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Other</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Please state

Please estimate in percentage how many of your cases are unilateral and how many are bilateral.
- O Unilateral
- O Bilateral

Which of the following surgical techniques do you use?

<table>
<thead>
<tr>
<th></th>
<th>Often</th>
<th>Regularly</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periareolar incision</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Liposuction as a separate procedure</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Donut (Benelli / Davidson)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Anchor (wise pattern)</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Minimal access pull through</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>UAL</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Adjunctive liposuction</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Other</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
Do you use any of the following?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Nearly never</th>
<th>Regularly</th>
<th>Nearly always</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Tumescent infiltration</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Drains</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Pressure garments</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Please estimate in percentage in which setting you operate the patients
- As in-patients
- Day care
- Office

What anesthesia do you use?
- Local
- Sedation
- General

Do you send the excised tissue for pathological examination?
- Always
- If indicated
- Never
- Starting age_______________

Please arrange the following complications in order from most to least common
- Bleeding
- Infection
- Seroma
- Nipple necrosis
- Unsatisfactory result
- Inverted nipple
- I have no complications

Have you or any of your colleagues ever had a patient operated on for gynecomastia who had a carcinoma in the pathology report?
- Yes
  - How many _____
- No

May we contact you about these patient/s?

Do you have any remarks you wish to make?