Gynecomastia is a benign condition characterized by enlargement of the male breast due to proliferation of the glandular tissue. This condition may be unilateral or bilateral, symmetric or asymmetric. Gynecomastia is thought to result from a number of mechanisms including an imbalance in the testosterone to estrogen ratio as well as an increase in human chorionic gonadotropin receptors and luteinizing hormone receptors in male breast tissue (1, 2). Gynecomastia is a common condition: about 60% of all boys develop transient pubertal breast enlargement (3), and 30-70% of adult men have palpable breast tissue, with the higher prevalence being seen in older men and those with concurrent medical illnesses (4, 5). The goals of surgical treatment of gynecomastia should include a pleasant chest shape with limited scar extension. The surgical treatment of gynecomastia is not restricted to one discipline but is performed by plastic, general and pediatric surgeons, with many differences in practice, and this may be due to different treatment philosophies or differences in patients referred to the different surgical disciplines (6). We present our experience in surgical treatment of gynecomastia as general surgeons.

Patients and methods

The clinical records of patients who underwent surgical treatment of gynecomastia between September 2008 and January 2015 in our Department of Surgery at the University of Cagliari were analyzed (Simon classification I-II B). 50 patients were included in this study. Prior to surgery, we took accurate medical history of patients and performed a full physical examination. Dosage of serum testosterone, estradiol, prolactin, chorionic gonadotropin, mammary and testicular ultrasound and endocrinological assessment were performed for excluding underlying endocrinopathies, metabolic disorders, testicular cancer, and for identify risk factors for gynecomastia. Surgical techniques used to correct gynecomastia included a pleasant chest shape with limited scar extension. The surgical treatment of gynecomastia is not restricted to one discipline but is performed by plastic, general and pediatric surgeons, with many differences in practice, and this may be due to different treatment philosophies or differences in patients referred to the different surgical disciplines (6). We present our experience in surgical treatment of gynecomastia as general surgeons.
were subcutaneous mastectomy using Webster method with periareolar incision or Pitanguy technique with tran-
sareolar incision if skin redundancy was absent and Da-
vividon concentric circles technique if skin reduction was
necessary. During the surgery the first operator establi-
sed if a suction drain was necessary or not on the basis
of extent of dissection. Each mammary specimen was exa-
mained to achieve histopathological diagnosis.

Results

50 patients were included in our study. As reported
in Table 1, gynecomastia was monolateral in 12 patients
(24%) and bilateral in 38 patients (76%). Median age was
28.6 ± 11.3 years. Not a single patient exhibited family
history of gynecomastia. 9 patients (18%) presented risk
factors for gynecomastia as drug abuse (cannabis, cocai-
ne), antiepileptic drugs, anabolic steroids, anti-androgens
drugs, history of prolactinoma or hypogonadotrophic hy-
pogonadism; in all other cases gynecomastia was idiopathic
(82%). 3 patients (6%) exhibited recurrent gynaecomas-
ta (2 patients formerly operated for bilateral gynecomastia
and 1 patient formerly operated for monolateral gyne-
comastia). 39 patients (78%) underwent surgical operation
under general anaesthesia, in 11 patients (22%) a local
anaesthesia with sedation was performed. Webster tech-
nique (Figures 1, 2) was performed for the correction
of gynecomastia in 28 patients (56%): 10 patients pre-
sented monolateral disease, 18 patients presented bilateral
disease. Davidson technique (Figures 3, 4) was perfor-
mep in 16 patients (32%): 2 patients presented mono-
lateral disease, 14 patients presented bilateral disease. In
2 patients (4%) with bilateral gynecomastia surgical ope-
ration was performed using Pitanguy technique. In 4 pa-
tients (8%) affected by bilateral gynecomastia a mixed sur-
gical technique was performed (Webster method + Da-
vividon method in 3 patients, Webster method + lipo-
suction in 1 patient). In 33 patients (66%) suction dra-
ignages were placed: suction drainages were used mainly
in patients operated with Davidson technique or mixed
technique compared to patients operated with Webster
method (93.7% vs 83.3% vs 46.4%, p=0.006). As re-
ported in Table 2, mean surgical time was 80.72±35.14
minutes (64.6±35.3 min for Webster Technique,
107.6±35.04 min for Davidson technique, 112.5±10.6
min for Pitanguy technique and 72.5±33.39 min for
mixed surgical technique, p<0.001). 2 patients (4%) ope-
rated using Davidson technique developed a hematoma
which did not require surgical treatment (p=0.2) and 1
patient (2%) operated using the same technique developed
hypertrophic scar (p=0.5). Median postoperative stay was
1.46±0.88 days (1.21±0.89 days for Webster technique,
2.0±0.89 days for Davidson Technique, 1 day for Pitan-
guy technique and 1±0.56 days for mixed surgical tech-

| TABLE 1 - DEMOGRAPHIC AND ETIOPATHOGENETIC DATA, SURGICAL TECHNIQUE. |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                | n=50            | Age (years)     | 28.6 ± 11.3     |
| Monolateral gynecomastia | 12 (24%)     | Bilateral gynecomastia | 38 (76%)     |
| Idiopathic gynecomastia  | 41 (82%)    | Secondary gynecomastia  | 9 (18%)     |
| Recurrent disease       | 3 (6%)       | Webster technique    | 28 (56%)     |
| Davidson technique      | 16 (32%)    | Pitanguy technique   | 2 (4%)       |
| Mixed technique         | 4 (8%)       |                                          

Figure 1 - Webster technique: preoperative image.

Figure 2 - Webster technique: postoperative image.
In every case histopathological examination excluded diagnosis of malignancy. Patients were contacted by phone in order to communicate their level of aesthetic satisfaction: 16 patients (32%) were unreachable; 73.5% of patients reached on the phone expressed satisfaction with final aesthetic result, 26.5% were unsatisfied because of breast asymmetry or hypertrophic scar. There was no significant differences between the techniques in the patient’s satisfaction.

**Discussion**

Gynecomastia is a benign clinical condition that can occur in men of all ages, characterized by enlargement of the male breast, due to proliferation of glandular tissue. This condition differs from pseudogynecomastia (fatty breasts), which usually occurs in obese men, due to increased local fat deposition without glandular enlargement (7). Gynecomastia is a common finding: about half of all men demonstrate histological evidence of gynecomastia at autopsy (8). Gynecomastia can be seen as part of the normal physiological development in the newborn, adolescent and elderly (9, 10), or it can also be a result of multiple conditions as chronic diseases, neoplasia and drugs (11); most cases of gynecomastia are caused by an hormonal imbalance between estrogens and androgens, with estrogen-induced stimulation predominating (12, 13), and this may occur with increased estrogen action, decreased androgen action or a combination of the two mechanisms. The majority of men affected by gynecomastia are asymptomatic, while those referred to the specialist present persistently tender breasts, palpable lump or unsatisfactory body image (14) with important psychological repercussions. Breast development is considered a female trait and it can produce a sense of spoiled identity in men with breast disease and the timing of the onset of gynecomastia is very important: the greatest psychological impact occurs with onset in adolescence as compared with senescence or young childhood (15). Medical history and physical examination are the main components of the evaluation of patients affected by gynecomastia and no further investigation is necessary in case of age-appropriate findings. If the physical

---

**Table 2 - Surgical Procedure: Surgical Time, Median Postoperative Stay and Postoperative Complications.**

<table>
<thead>
<tr>
<th></th>
<th>Webster Technique (n=28)</th>
<th>Davidson Technique (n=16)</th>
<th>Pitanguy Technique (n=2)</th>
<th>Mixed Technique (n=4)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical time (min)</td>
<td>64.6±35.3</td>
<td>107.6±35.04</td>
<td>112.5±10.6</td>
<td>72.5±33.39</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Postoperative stay (days)</td>
<td>1.21±0.89</td>
<td>2±0.89</td>
<td>1</td>
<td>1±0.56</td>
<td>0.02</td>
</tr>
<tr>
<td>Hematoma</td>
<td>0%</td>
<td>2 (4%)</td>
<td>0%</td>
<td>0%</td>
<td>0.2</td>
</tr>
<tr>
<td>Hypertrophic scar</td>
<td>0%</td>
<td>1 (2%)</td>
<td>0%</td>
<td>0%</td>
<td>0.5</td>
</tr>
<tr>
<td>Wound infection</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Necrosis of nipple-areolar complex</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

---

Copyright © 2016 CIC Edizioni Internazionali Unauthorized reproduction of this article is prohibited.
Surgical management of gynecomastia: experience of a general surgery center

Men affected by gynecomastia are not considered at high risk for breast cancer (30); Klinefelter syndrome is the only condition which presents high risk of cancer, with a 50-fold higher risk that among men in the general population (31, 32), however some risk factors for gynecomastia, such as estrogen use or androgen deficiency, also are related to male breast cancer (33-35); on that basis, we performed routine histopathological analysis of all mammary specimens in order to exclude malignancy. Also it does not seem to be any relationship with other rare diseases of the male breast (36, 37). Given that the biggest problem of patients affected by gynecomastia of all grades generally is unsatisfactory body image, assessment of patient satisfaction with final aesthetic result is fundamental: 73.5% of our patients expressed full satisfaction with final results; breast asymmetry and hypertrophic scars represented main causes of patient dissatisfaction. There was no significant differences between the techniques in the patient’s satisfaction.

Conclusions

Gynecomastia is a common finding in male population and this condition can be self-limiting. In case of persistence and correlated symptomatology responsible for reduced quality of life treatment should be performed. Surgical correction is more effective than medical therapy. Several surgical techniques are described for correcting gynecomastia. If performed by experienced general surgeons using few validated techniques, surgical treatment of gynecomastia is safe and permits to reach satisfactory aesthetic results with minimal complications.
References