Topics in plastic surgery of the breast
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ENGLISH SUMMARY AND DISCUSSION
The breast is an integral part of both the female and the male body. Its evolutionary role is the feeding of offspring, although in males it has no function and can be considered an atavistic remnant. Breasts are not essential for life as one can live without them, and in the present era they are not essential for the feeding of newborns since the advent of bottle feeding. However, breasts are important for the completeness of the body image and for sexuality, as well as typifying masculinity and femininity. Surgery of the breasts may be required in the case of disease or because the patient wishes to improve the body image or reverse the sequelae of disease.

In this thesis different aspects of plastic surgery of the breast are explored. In the first two parts the female breast is approached from the aspects of breast reduction and breast augmentation. The third part focuses on an often overlooked issue, namely the male breast. The fourth part presents cases of breast reduction, augmentation and reconstruction in which out-of-the-box solutions were implemented.

PART 1

Many studies have demonstrated the benefit to the patient of reduction mammoplasty. Nevertheless, plastic surgeons and patients are still in a defensive position when seeking to justify the performance of such surgery in the face of skepticism and the reluctance of health care insurers to cover the costs of such surgery.

CHAPTER 2

Back pain is one of the symptoms required by most insurers for the coverage of reduction mammoplasty. Chapter 2 investigates whether patient posture, measured using standardized photographs, is affected by breast size, and whether patient posture changes following reduction mammoplasty. It was found that the inclination angle of the back in breast reduction candidates is significantly different from that of controls. However, this difference is small and on multivariate analysis it was found to be dependent on BMI. The difference found probably does not account for the symptoms associated with macromastia. The observed change in the posture angle following surgery was not significant. Although these can be considered “negative results”, they are important because they show that back inclination should not be used as a surrogate “objective” measure for symptomatic macromastia for the allocation of breast reduction surgery by medical insurers.

CHAPTER 3

It has been shown that even small breast reductions lead to a lessening of pain symptoms and an improvement in quality of life. It is sometimes stated that patients seeking a reduction mammoplasty have a psychological problem, and that their motivation for seeking surgery is psychological. In Chapter 3 a study is presented in which the SCL-90, a validated score for psychoneurotism, was used to test patients presenting for reduction mammoplasty prior to surgery. The patients’ scores were
compared with the population norms and were found to be only slightly, and non-significantly, higher. The SCL-90 has subscales and those scores were significantly higher only for somatization and sleep disturbance – symptoms that are expected to be present in patients with symptomatic breast hypertrophy. Since most patients have normal scores, reduction mammaplasty should not be denied on the basis that the motivation is the result of psychopathology. Psychological testing is therefore not recommended in most patients presenting for breast reduction surgery.

CHAPTER 4
Venous thromboembolism (VTE) is one of the most feared complications of surgery which may cause death. The prevention of VTE has been gaining attention in recent years. Most practices used in plastic surgery are extrapolations from other fields of surgery. The North American protocols call mainly for the use of mechanical means for prophylaxis; these include compression stockings and intermittent compression devices. In the Netherlands the standard of care is chemoprophylaxis using low molecular weight heparin (LMWH), an anticoagulant. This is administered preoperatively as well as postoperatively. It may be hypothesized that the use of LMWH during an operation with large dissections will increase the risk of hemorrhage. In Chapter 4 a series of 720 patients who underwent reduction mammaplasty using pre- and postoperative LMWH prophylaxis is presented. Reoperation for hemorrhage was necessary in 5.1% of patients. This figure is within the rates for historical controls. No correlation was found between the time from administration of LMWH and hemorrhage. No patient or operative factors were associated with the need for reoperation. The use of LMWH for patients undergoing reduction mammaplasty can therefore be considered safe.

PART 2
Augmentation mammaplasty is the most popular esthetic surgery in the US as well as worldwide. The safety of breast implants has received increased scrutiny in recent years. Breast cancer is the most common cancer in women, affecting one in seven Dutch women. The question therefore arises whether patients who have undergone a breast augmentation have an increased risk of developing breast cancer. This question was evaluated using two different approaches.

CHAPTER 5
Pooling data from multiple sources can increase its validity. Chapter 5 presents a meta-analysis of observational studies. A literature search for publications reporting on cancer incidence in patients who had undergone a breast augmentation was performed and 17 eligible publications were included, from 7 cohorts. It was found that in studies that used a control group the relative risk was 0.63 and in studies that compared the patients with implants against the population, the standardized incidence ratio was
0.69. This meta-analysis suggests that women who have undergone cosmetic breast augmentation using implants are not at increased risk of subsequently developing breast cancer.

Chapter 6
The body inherently mounts a reaction to foreign materials and this is also the case with breast implants. In fact, breast implants will always cause the formation of a tissue reaction known as a capsule. If the capsule formation is excessive, this is observed as capsular contraction.

Capsular formation is the most common reason for revision surgery in patients with breast implants. During revision surgery it may be decided to remove the capsule (capsulectomy) or only to incise it (capsulotomy). In Chapter 6 a study is presented that used a national database, PALGA, the Nationwide Network and Registry of Histopathology and Cytopathology in the Netherlands. The reports on 2531 patients who had a primary capsulectomy were retrieved. It was found that the incidence of invasive carcinomas among them was 0.16%. The incidence of ductal carcinoma in situ was also 0.16%, and of lobular carcinoma in situ 0.04%. These figures are low. Therefore it is not necessary to perform a capsulectomy for oncologic reasons and it is safe to leave capsule tissue in situ provided there are no suspicious clinical findings. Surgeons should use clinical judgment regarding the need for capsulectomy.

Part 3
The male breast may also present with pathologies or abnormalities. Despite the similarities with the female breast, these pathologies or abnormalities should be assessed and treated differently from those seen in women.

Gynecomastia which is the benign enlargement of the male breast, is the most common finding. Patients seek treatment due to anxiety because of the breast growth, pain or psychological distress due to the feminization of their breasts.

Chapter 7
The management of patients with gynecomastia at the AMC over a 20-year period is presented in Chapter 7. A total of 179 patients were treated. They were operated on by three disciplines: plastic surgery, general surgery and pediatric surgery. Plastic surgeons performed most of the operations. There were differences between the disciplines in the patient groups operated on, as well as between the workup and the operative techniques used. Plastic surgeons performed more bilateral operations than the other disciplines. Surgeons used more preoperative radiology and cytology testing. Plastic surgeons did not always submit material for pathological examination. These findings point to a possible difference in the patients referred to and treated by the different disciplines.
CHAPTER 8
In order to check whether the findings presented in Chapter 7 were specific to only one hospital or would also be seen nationwide, a national survey was performed among surgeons of the disciplines that operate on gynecomastia: plastic surgery, general surgery and pediatric surgery. The participants were asked about their opinions and practices in the management of gynecomastia. The survey results are presented in Chapter 8 and are similar to the findings presented in Chapter 7. Plastic surgeons operated on gynecomastia most frequently. The diagnostic criteria and workup 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. All disciplines agreed that the most common complication was bleeding, followed by seroma, infection, insufficient results, inverted nipple and nipple necrosis.
This survey highlighted 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.

CHAPTER 9
In the previous chapters it was seen that there are differences between practitioners in the use of preoperative imaging. Due to the scarcity of pathological findings in the male breast, one may question the necessity for this testing, which is possibly being overused. In Chapter 9 the outcome of imaging of the male breast performed at AMC is was presented, covering 557 identified patients over a 10-year period. Referral for imaging was done mainly by general surgeons and general practitioners. This finding is similar to that of the two previous studies in which it was found that general surgeons made more use of imaging than plastic and pediatric surgeons. The most common indication for imaging was enlargement of the breast, described as gynecomastia or swelling in 74% of patients, followed by pain in 24% and “lumps” in 10%. The modalities used were mammography in 65%, ultrasound in 51% and both in 26%. Most examinations, 519, had a BI-RADS (Breast Imaging Reporting and Data System) score of 1 or 2, and 38 had a score of 3 or higher. Altogether 160 patients had additional fine needle aspiration or biopsy. Malignancies were diagnosed in 5 patients (0.89%). Imaging had a sensitivity of 80% and a specificity of 99%. The positive predictive value was 44% and the negative predictive value 99.8%. Since malignancies are rare in the male breast, the probability of finding cancer when performing imaging of clinically benign findings in the male breast is negligible. Imaging is not warranted.
unless there are obvious abnormalities. Routine imaging of gynecomastia cases should be discouraged. Medical insurers should not request that imaging be performed as a provision for coverage of gynecomastia surgery.

Chapter 10
Once the workup of a patient with gynecomastia has been completed, and if no etiology was found, one may define it as idiopathic gynecomastia. This is most often the case in adolescents. If gynecomastia has been present for less than a year, it may be reversible. Tamoxifen, an anti-estrogen, has been suggested as a potential pharmaceutical treatment for gynecomastia. Safe and effective pharmacological treatment may obviate the need for surgery. Chapter 10 presents the results of a systematic review of the use of tamoxifen for the treatment of pubertal gynecomastia. No randomized studies were found. Six studies were identified that reported the use of tamoxifen for idiopathic gynecomastia in adolescents. However, the level of evidence of these studies is low. The studies report resolution rates for gynecomastia between 80 and 100%. No serious side effects and no effects on growth are reported.

Although tamoxifen therapy for pubertal gynecomastia might be safe and effective, the evidence available in the medical literature is insufficient to prove this. If clinicians choose to prescribe tamoxifen for adolescent gynecomastia, they should emphasize the off-label indication to patients and their caregivers.

Chapter 11
In the previous studies it was found that practitioners do not always submit the excised material for pathological examination. In the case of breast reduction and as previously shown, in capsulectomies the use of such examinations has a low yield. Chapter 11 reports on the histopathological findings in gynecomastia. Data were retrieved from the database of PALGA, the Nationwide Network and Registry of Histopathology and Cytopathology in the Netherlands. Histopathological results of breast tissue excised during surgery for gynecomastia over a 4.5-year period were retrieved. The analysis included 5113 breasts from 3719 patients.

The most common pathology diagnoses were gynecomastia, reported in 94.1% of the patients, and pseudo–gynecomastia, found in 5.3% of the patients. The overall per-procedure prevalence of invasive carcinoma was 0.11% and for ductal carcinoma in situ 0.19%. For unilateral procedures these figures are, respectively, 0.17% and 0.22%. For bilateral cases, the figures are 0% and 0.14%. However, the difference between the prevalence in unilateral and bilateral procedures was not significant. One could conclude from this that the approach to unilateral and bilateral cases of gynecomastia should be the same, but one must bear in mind that despite the large size of the series, the incidence of malignancies observed was low. In addition, it is probable that patients who had suspicious findings preoperatively were no longer treated as having gynecomastia.
PART 4

This part of the thesis describes unusual solutions to rare clinical problems. Due to their nature, such special situations cannot be evaluated in the framework of a prospective study. Nevertheless, despite the low level of evidence, such reports can be valuable for clinicians who are confronted with a similar situation. They may choose to use the same approach or, on the other hand, chose not to do so based on the previous experience.

CHAPTER 12

A case of allogeneic lipofilling to the breast is presented. Fat was harvested from the patient’s brother and transplanted into the patient by lipofilling. This was possible due to the fact that the patient had previously undergone allogeneic hematopoietic progenitor cell transplantation from her brother.

This case is interesting in two respects. First, it stresses the points taught in the first years of medical school: “The patient is always right” and “Listen to the patient”. Secondly, it shows that it is possible for patients who have undergone allogeneic hematopoietic progenitor cell transplantation to receive allogeneic tissue transplants from the same donor. In addition, it raises moral and ethical questions about a donor being asked to donate tissue or an organ a second time.

CHAPTER 13

The management and reconstruction of gestational macromastia (excessive breast enlargement) during pregnancy is presented in Chapter 13. In the case discussed it was decided to perform a mastectomy followed by delayed staged reconstruction. Such cases are extremely rare and a clinician reading this a report will be better prepared when drawing up his or her management plan. There are several points that are important to keep in mind when treating such a case. First, it is essential to plan comprehensively and to treat the patient as a multidisciplinary team. Secondly, one must make decisions on the treatment and the timing of the treatment based on the health of the patients, namely both the mother and the newborn. One should consider and inform the mother of the different options. If it is elected to perform a mastectomy, one should consider the banking of the nipples or secondary reconstruction in order to avoid misplacement of the nipples.

CHAPTER 14

The use of implants for breast augmentation and for reconstruction is widespread. An infection of the implant, or more correctly stated a periprosthetic infection, can be a devastating complication. Of course prevention is better than treatment, but in the rare situation in which one is confronted with such an infection one may choose between removing the implant and treating the infection, and an attempt at salvage.
Four cases of periprosthetic infections were successfully managed. Due to the nature of this situation it is virtually impossible to perform a prospective study and thus it cannot be ascertained that the use of a gentamicin sponge contributed to the successful result.

CHAPTER 15

Nipple malposition is an unfavorable outcome that may be seen following surgery on the breast. During the preoperative planning, care should be taken to avoid this outcome. However, in the case of breast reconstruction it may be unavoidable due to a preexisting situation.

One may choose to correct malposition during the same session as the reconstruction or elect to correct it secondarily. Two different approaches to a similar problem are presented.

DISCUSSION

When looking for answers, new questions inevitably arise. This is also the case in the studies presented in this thesis. As a plastic surgeon one regularly encounters the gratitude of patients who have undergone a breast reduction. It seems obvious that this procedure is justified in many cases, but the justification for this procedure has to be continuously proved. In this thesis evidence was presented supporting this notion. Evidence was presented on the safety of breast augmentation, or more precisely the reduced risk of breast cancer in patients who have undergone breast augmentation. Topics were presented concerning the male breast and in particular gynecomastia and its treatment. And lastly, unusual cases were presented.

A weakness of all these studies is that we did not always use standard, validated and uniform tools to measure the severity of findings and outcomes. This is not for lack of wanting to do so – it is in fact a weakness that is unfortunately common to much of the clinical research in plastic surgery. This makes it difficult to compare the results of studies. If the use of such scales were to be broadly implemented, it could also help to increase the size of series by making it possible to pool data from more medical centers.

The key to future clinical research on the topics presented in this thesis is better and more uniform registration of data. This can be achieved by the use of standard data which are systematically collected before, during and after surgery, as well as the use of the standardized tools that have become available, such as the Breast-Q (a validated questionnaire). Furthermore, there is a need to validate the currently used scales and to develop new scales. Pooling the data from multiple centers would be the best way to go, despite the reluctance of health care providers to reveal their information and share “their” data. Having reliable data would also enable high-quality retrospective studies to be done.
The recent PIP implant scandal has actually contributed to a resolution by the NVPC (the Dutch Society of Plastic Surgery) to implement a national registry of breast implants. Such moves should and are expected to be extrapolated to other aspects of plastic surgery and medicine in general. Implementing such a registration entails significant costs and an increased work burden. Medical insurers should contribute to such initiatives by covering the cost of such registration and research.