English summary

Part 1 The surgeon & breast reconstructions with an implant

• **CHAPTER 2**: In this chapter we performed a retrospective survey of patients who had undergone a breast reconstruction in one step with the use of Strattice (LifeCell, Branchburg, NJ, VS), the acellular matrix from pig skin. Based on these data we were able to draw a conclusion about the initial experience using this relatively new method. We evaluated all casuistry for breast reconstructions between 2010 and 2014 in this way in eight different centres in the Netherlands, by collecting patient details and clinical outcome details. In this cohort, the total complication rate was very high (78%). Although most complications were minor, second operations were performed for 22.7%, and 11.8% of the total number of breasts had an explantation. The most important conclusion in this chapter is that the patient selection, the surgeon’s experience and the treatment of early complications seem to play a crucial role in the success of this operation technique. The use of Strattice in direct breast reconstructions with an implant may be a promising technique, based on these preliminary details, but more evidence from prospective, randomized studies was needed to justify its use.

• **CHAPTER 3**: In this chapter we collected prospective data by the carrying out an open-label, randomized, controlled study in eight hospitals in the Netherlands. Women were allocated either a direct breast reconstruction in one phase with an ADM (Strattice) or in two phases with a tissue expander and subsequent implant. In this chapter the safety of this method was documented. We concluded that direct breast reconstruction with an implant and an ADM was associated with a significantly higher risk per complication risk (odds ratio 3.81, 95% CI 2.67-5.43, p<0.001), the number of second operations (3.38, 2.10-5.45, p<0.001) and explantations of the implant, ADM or both (8.80, 8.24-9.40, p<0.001) than the two-step procedure with a tissue expander. Serious (grade 3) complications occurred in 26 (29%) of the 91 breasts in the one-step group with an ADM and in five (5%) out of 92 in the two-step group. The frequency from mild to moderate complications was comparable in the two groups. From this study we conclude that the one-step breast reconstruction with an implant and an ADM is associated with many complications and therefore has to be considered carefully. The understanding into the selection of patients, risk factors and surgical and post-operative procedures has to be researched further.
English summary

• **CHAPTER 4:** Within this study we tried to focus on identifying which factors could add to the occurrence of complications after a one-step breast reconstruction with an implant and an ADM. The details for this analysis were obtained from the BRIOS-study. In the multivariable analysis the mastectomy weight was associated with complications (odds ratio (OR) 1.94, 95% CI 1.33 to 2.83), second operations (OR 1.70, 1.12 to 2.59) and explantations of the implant (OR 0.85, 1.11 to 2.17). Younger patients (OR 1.07, 1.01 to 1.13) and those who had received adjuvant chemotherapy (OR 4.83, 1.15 to 20.24) needed a second operation more often. In univariable analyses adjuvant radiotherapy showed a trend in the direction of more complications (OR 7.23, 0.75 to 69.95) and explantation of the implant (OR 5.12, 0.76 to 34.44) without reaching statistical significance. Breast girth turned out to be the most significant predictor of complications in one-step breast reconstructions with an implant and an ADM. Based on this we could conclude that this technique should preferably be performed in patients with small to medium sized breasts.

• **CHAPTER 5:** Within this study, all 385 members of the Dutch Society for Plastic Surgery were invited by mail in 2016 to participate in a questionnaire about sexuality within the plastic surgical practice. 106 completed questionnaires were received (27.5%). Most participants (78.3%) indicated that they rarely discuss sexuality with their patients. In the plastic surgeon’s practice sexuality seems to be a subject rarely discussed, within which the gender and genital surgery as sub specializations form an exception. Although professionals and patients emphasize the importance of sexuality, plastic surgeons show limited interest in being educated in this subject and they prefer written patient information and the referral of patients to other practitioners in health care.

**Part 2 The patient & breast reconstructions with an implant**

• **CHAPTER 6:** In this chapter we introduced the aesthetic assessment of the reconstructed breast by using the Aesthetic Items Scale (AIS) again, in order to assess whether this method is a valid and reliable tool in assessing the result after breast reconstructive surgery. The research population consisted of women who had undergone a prophylactic mastectomy with subsequent breast reconstructions based on implants. The aesthetic result was assessed according to the AIS with standardized photos. The photos were assessed by the patient, 5 plastic surgeons and 3 mammography nurses. An overall assessment
of aesthetic results on a scale from 1 to 10 was given separately. We found that the interobserver reliability was the highest among plastic surgeons. The total score of the AIS correlated strongly with the general assessment by the professionals, but not by the patients. This led us to the conclusion that the AIS is a valid and reliable method for the evaluation of the aesthetic results of breast reconstructions, particularly by plastic surgeons. But the results showed that patients assess the aesthetic result differently. They take into account factors that are not represented in the AIS. Professionals can actually use the AIS method to evaluate surgical results, but other measurements are needed to record patients' aesthetic satisfaction.

- **CHAPTER 7**: In this chapter we looked at another patient-related outcome: quality of life. We strived to evaluate patient satisfaction after breast reconstruction with an implant and ADM. Patients with ADM-assisted breast reconstructions and an implant were invited to fill in the BREAST-Q. In total 208 patients (38.4%) responded and they reported an average satisfaction of 70.6±20.2 with their breasts and 78.0±20.5 with the result. A total number of complications of 7.7% was found, with 1.5% serious complications resulting in hospitalization (0.5%) and removal of the implant (0.5%). There is an increased demand for patient-reported outcome measures in a changing practice, in which the patient's opinion plays a more important role. With such high satisfaction percentages, ADM-assisted breast reconstruction is a valuable method, on condition that the complication rate remains low. That is why it should only be performed in a selected group of women.

- **CHAPTER 8**: The advantage of the use of an ADM in one-step breast reconstructions with an implant could possibly be that it generates better aesthetic results. Here we present the results of the primary end point of the BRIOS study from chapter 3 to assess whether one-step breast reconstructions with an ADM provide a higher quality of life (QOL) as reported by the patient, compared to two-step breast reconstructions with a tissue expander. Between 14 April 2013 and 29 May 2015, we included 142 women in the study, of whom 69 were appointed at random to an ADM-assisted group in one phase and 73 women underwent a breast reconstruction in two phases. After the exclusions, the modified intention-to-treat population consisted of 60 patients in the one-step group and 61 patients in the two-step group. Within these groups, 48 women (median follow-up 17.0 months [SD 7.8]) in the one-step group and 44 women (17.2 months [SD 6.7]) in the two-step group completed the
BREAST-Q at least 1 year after the positioning of the implant. We did not find any significant differences in the postoperative patient-reported quality of life domains, including physical well-being (one-step group 78.0 [SD 14.1] versus two-step group 79.3 [12.2], p=0.60), psycho social well-being (72.6 [17.3] versus 72.8 [19.6], p=0.95), and sexual well-being (58.0 [17.0] versus 57.1 [19.5], p=0.82), or in the patient reported satisfaction domains: satisfaction with breasts (63.4 [15.8] versus 60.3 [15.4], p=0.35) and satisfaction with the result (72.8 [19.1] vs 67.8 [16.3], p=0.19). The outcome measure in the patient reported quality of life also does not show any superior results in the one-step group with an ADM compared to the two-step group with a tissue expander. The risks of unfavourable results are significantly higher in the ADM group with one phase. The use of ADM for breast reconstructions with an implant in one phase, therefore, has to be considered from case to case.

• CHAPTER 9: In this last chapter of the study we focused on breast reconstructive surgery and sexuality. Our interest was in the understanding of the impact of the breast reconstruction on sexuality in this group of patients. To achieve this we held in-depth interviews on the experience of different aspects of sexuality of patients and the impact of the breast reconstruction. Four main themes emerged from the interview data on sexuality after breast reconstruction: experience with body image; unfulfilled expectations; the partner relationship; and improvement of care. Sexuality appears to be a key factor in women’s quality of life and can be strongly affected by breast amputation and breast reconstruction. From this study we learn that sexuality is a complex problem that is often forgotten in pre-operative counselling and post-operative follow-up. Breast reconstruction does not automatically restore a patient’s sexuality and often does not meet the pre-operative expectations.