Advances of Plastic & Reconstructive Surgery

Chapter 2

Options in Breast Reconstruction and Plastic Surgery in Regard to Surgeon Perceptions and Patient Acceptance in Saudi Arabia

Bassam Ahmed ALmutlaq, MBBS[1]; Mohammad Al-Qattan, PhD[2]; Raed Dawood Almansour, MBBS[3]; Awad Nafel Al Harbi, MBBS[3]; Ali Dawood Almansour[3]; Omar Abdullah AL-Noqaidan, MBBS[3]; Abdul Rahman Ali Al-Sogair[3]; Abdullah Abdulaziz Bin Jariyd, MBBS[4]; Hussain Gad-elkarim Ahmed, Phd[3]

[1] University of Hail - College of Medicine, Member of Saudi Scientic Association of Plastic Surgery and Burns , Kingdom of Saudi Arabia

[2] Head Division of Plastic Surgery, Head of Research Centre, College of Medicine, King Saud University, Riyadh, KSA

[3] College of Medicine, University of Hail, Hail, KSA

[4] Faculty of Medicine, Al Imam Mohammad Ibn Saud Islamic University, Riyadh, KSA

***Correspondance to: Bassam Ahmed ALmutlaq, MBBS,** University of Hail - College of Medicine, Member of Saudi Scientic Association of Plastic Surgery and Burns , Kingdom of Saudi Arabia*

Email: dr.bassam.almutlaq@gmail.com

Abstract

In this review article, various preferences in breast plastic surgery particularly after breast cancer will be discussed in view of the diverse indications for the different construction procedures. The various conditions that necessitate the need for reconstruction are appraised, the important reconstructive procedures are discussed. The most important indications procedures discussed in this review include; Prophylactic subcutaneous mastectomy, Lumpectomy and Radiation, Modified Mastectomy with Axillary Sampling, Nipple reconstruction, and the contralateral breast. These procedures are discussed in view of plastic surgeon practice and patients acceptability in Saudi Arabia. Data from Saudi Arabia in particular was identified through searches of the EMBASE, and MEDLINE database, using the keywords: Saudi Arabia, breast plastic Surgery, breast reconstruction, autologous breast reconstruction, breast augmentation.

Advances in prosthetic technologies and modifications in autologous flap techniques, and the development of novel tissue alternatives have allowed for sustained developments in breast reconstruction results. A variety of attitudes has been accessible for addressing the difficulties that endure after resection of breast cancer in Saudi Arabia. Patients should be educated to accept different process in this context.

Key words: Saudi Arabia; breast plastic Surgery; breast construction

1. Introduction

Breast cancer is the commonest females' cancer worldwide, and is a leading cause of cancer mortality among females'. Prophylactic or curative mastectomy is regularly followed by breast reconstruction applying several surgical procedures that use breast implants with which surgeons can reinstate the natural size, feel, and shape of the breast [1]. Breast reconstruction is a substitute for patients after breast mastectomy, or after breast conservation therapy. Breast reconstruction provides social, emotional, functional, and psychological health improvements [2].

Breast reconstruction provides the physical benefit of not having to wear an external prosthesis and easiness the undesirable impression on a patient's body image [3].

It is well known that breast mastectomy followed by breast reconstruction is broadly practiced, but the patients should be offered the final decision including the option of having no reconstruction. Nevertheless, some women regard their choice of no reconstruction as positive and feel very easy with their bodies' image and their choice.

This review discussed the different preferences for breast reconstruction. The various methodologies are categorized in regard to the preliminary surgery that is done to control the cancer, and the chemotherapy and/or radiation that is subsequently indorsed. For women who have mastectomy because of breast cancer, there are numerous preferences of breast reconstruction to manipulate their lost breast. The preferences are unavoidably influenced by the primary clinical status of the cancer, together with its magnitude and aggressiveness, but finally the patient must be the final negotiat or to select the suitable preference.

2. Options in Breast Surgical Reconstruction

Latest developments in prosthetic and biologic implants, combined with advances in reconstrucive flap procedures, have extended surgical choices for women who deire breast reconstruction. Each procedure offers distinctive advantages and deficiencies. Appropriate patient selection improving quality and limiting complications can bring about the highest patient satisfaction. Even though, breast reconstruction is practiced based on aesthetic principles, several factors must be considered when choosing the appropriate operation [4]. These factors include; Patient-related factors such as, breast shape, breast size body mass index (BMI), prior

surgeries, prospects and wishes. Oncologic aspects include; tumor size, nodal status and prior history of radiation therapy or its inevitability next to mastectomy. Surgeon-related factors, such as the technical capability of the surgeon to perform a miscellany of techniques in a predictably safe and effective way [5,6].

3. Timing of Breast Reconstruction

In carefully chosen patients, reconstruction implemented simultaneously with mastectomy is an ontologically safe procedure [7,8]. Instant reconstruction with a skin sparing mastectomy conserves the breast skin wrapper, except for the nipple areola complex, and results in a higher aesthetic results compared to late reconstruction. Instantaneous reconstruction permits the plastic surgeon to work with a flexible natural skin wrapping, definite inframammary fold, and lateral breast edge. Instant reconstruction would be advised for patients determined to do breast reconstruction, and those attended for either prophylactic mastectomy or with a clinical cancer stage that will not usually require post mastectomy radiation treatment. Chemotherapy, whether before or after mastectomy might not directly influence the long term outcome of reconstruction [9,10]. These complications can lead to deprived cosmetics from the negative effect of radiation on skin flexibility and the alteration of the skin envelope [11,12].

Breast reconstruction is not thought to be the standard option for patients with metastatic breast cancer, as the elevated morbidity and retrieval after breast reconstruction may affect the critical systemic therapies [13].

4. Types of Breast Reconstruction Procedures

4.1. Prophylactic subcutaneous mastectomy

Prophylactic subcutaneous mastectomy has developed to be a common choice for women with an increased risk of evolving breast cancer, since it has been evidenced to decrease the risk of breast cancer by more than 90%. Prophylactic mastectomy is becoming a gradually every day procedure. When preparing for mastectomy and reconstruction, the aesthetic outcome should be considered by plastic surgeons. Now a days, ability to predict the high-risk population has improved and it is that population who can acquire the greatest positive outcomes from this intervention. The commendation against subcutaneous prophylactic mastectomy deficiencies scientific confirmation. There is adequacy of evidence that prophylactic mastectomy decreases the risk of breast cancer in the high-risk population in at least 95% [14].

Breast reconstruction after prophylactic mastectomy was safe results in a high percentage of patient satisfaction. The results from reconstruction after prophylactic mastectomy trended toward improved aesthetic outcome with a minor complications compared with reconstruction after ward therapeutic mastectomy [15]. The key suggestion of prophylactic mas-

tectomy relates to BRCA1 or BRCA2 mutation carriers. Prophylactic mastectomy involves the simple method and the subcutaneous method. Both methods can be followed by breast plastic reconstruction either corresponding or later [16]. Prophylactic subcutaneous mastectomy is accepted for individuals with conditions that considerably upsurge the risk of breast cancer, such as, presence of the BRCA1 and BRCA2 genes, cancer in the contrasting breast in a relatively young patient; a strong family history of breast cancer, and extensive fibrocystic breast disease that makes it difficult to follow the patient. It is essential to bear in mind that subcutaneous mastectomy does not eliminate all the breast tissue, therefore the likelihood of developing breast cancer still present.

In most instant reconstruction is performed immediately at the time of subcutaneous mastectomy, but it can be delayed to guarantee the viability of e skin envelope [17]. Even though, there is a number of reconstructive options, the most widespread technique implicates-implanting a silicone or saline implant so that its upper part is beneath the pectoralis muscle, and the lower part is in the subcutaneous plane [18].

4.2. Lumpectomy

Lumpectomy followed by radiation is another common procedure following the diagnosis of breast cancer. The significant of breast deformity after tissue removal depends on the amount of breast tissue which, was removed and the size of the breast, on the response of the breast tissue to the effects of radiation. After reconstruction is completed after radiation therapy, capsular contraction or excessive firmness of the implant arises very commonly, causing a reconstruction that can be painful due to the resulting capsule stiffness. This is also frequently supplemented by deformation of the implant shape and a poor aesthetic appearance [19].

The important principle to remember through out reconstruction after radiation is that the tissue used for the reconstruction should have its own blood supply; healing is hardly challenging in an irradiated site. Consequently, flaps to supply added volume are frequently made from the latissimus dorsi obtained from the lateral midback or a transverse rectus abdominus myocutaneous flap taken from the abdomen. The use of tissue expanders followed by implants isn't certified after radiation because of the likely development of a significant capsular contraction with breast deformity, excessive firmness and possibility of pain [20].

4.3. Mastectomy with axillary sampling

Modified mastectomy with axillary sampling is a procedure that is frequently ordered by the surgical breast oncologist. There are various reconstructive varieties accessible, as well as issues of timing of these procedures, since reconstruction can be instant or late.

Latissimus dorsi myocutaneous flaps, which usually necessitate an underlying silicone/

saline implant to attain satisfactory volume, can be done as a single stage breast reconstruction. Likewise, both transverse rectus abdominus myocutaneous flaps, and free microvascular abdominal or buttocks flaps, have the benefit of being single-stage reconstructive procedures, but either approach is more practically difficult. A significant disadvantage of the traditional technique for harvesting latissimus dorsi (LD) myocutaneous flap is a long, posterior donor-site incision. Modern techniques implicate endoscopic or robotic harvesting through a joint approach of open and closed surgery, which requires an open axillary incision and the usage of distinct retractors. Enclosed laparoscopic harvesting of LD flap is simpler and less invasive than the traditional one [21].

4.4. Nipple reconstruction

Nipple and areola reconstructions are commonly the last phase of breast reconstruction, which requires a separate surgery performed to render the reconstructed breast appear relatively similar to the original one. Perfectly, nipple and areola reconstruction matches the position, size, shape, texture, color, and projection of the new nipple to the natural one. Tissue used to reconstruct the nipple and areola originates from the newly produced breast or, less often, from another part of the body. In some cases, the areola and nipple part are reconstructed with donor skin that's had the cells removed. If a woman desires to match the color of the nipple and areola of the other breast, tattooing may be done a few months afterward the surgery.

There are several innovative methods to construct a nipple and each technique has its exclusive characteristics that relate to certain breast types. Nipple-areola complex reconstruction techniques involves local flap, composite nipple grafts, flaps with autologous graft augmentation, flaps with allograft augmentation and flaps with alloplastic augmentation. Areolar reconstruction using skin grafting and tattooing are the commonest techniques. By the development of procedures and technology, maybe the innovative approaches of NAC reconstruction can yield promising long-lasting aesthetically acceptable outcomes with slight morbidity [22,23].

Projection of the nipple can be shaped via different local flaps, but with all of the procedures there is an affinity for some regression of projection to take place over time. Aninnovative, but simpler method of nipple reconstruction is performed by means of tattoo. The areola is formed by tattooing, after which the nipple can be imitated by using a darker pigment [24,25]. A skillful plastic surgeon may be able to use pigment in shades that render the flat tattoo appear 3-dimensional.

4.5. The contralateral breast

Family history of breast cancer is accompanied with an augmented risk of contralateral-breast cancer (CBC) even in the nonexistence of mutations in the breast cancer susceptibility

genes BRCA1/ BRCA2 [26]. Contralateral prophylactic mastectomy (CPM) removes the opposite healthy breast in women who have unilateral breast cancer. This decreases the occurrence of contralateral breast cancer, and greatly increases survival in high risk patients [27].

To achieve superior symmetry, there may be a necessity to adjust the opposite breast. If the operated breast has been reduced in size, a reduction mammoplasty can be performed on the opposite breast to condense its size comparably and to uplift it. If elevation alone is all that is essential, a mastopexy may be engaged [28].

5. Types of Breast Reconstruction

Breast reconstruction is usually performed either prosthetic devices or autologous tissue flaps, or a combination of these two approaches [29].

5.1. Implant-based reconstruction

Implant-basedbreast reconstructionwith an acellular dermal matrix is one of the most common techniques used by plastic surgeons [30]. In recent times, the acellular dermal matrix (ADM) method has been extensively used in implant-based breast reconstruction in the western countries [31].

Implant-based reconstruction has the distinctive benefit of being a less invasive technique with easier recovery as there is no distant donor site morbidity. Although the overall of complications may be little in accurately selected patients, implants are foreign materials and has risks of infection that may lead to prosthetic removal. Additional risks associated with implants comprise capsular contracture, leakage, malposition, and extrusion which all may necessitate additional surgery and implant replacement [30].

The ideal candidate for implant-based reconstruction is a patient with small to moderate breast volume, mild to moderate ptosis, and low BMI. Patients with an active life style, who refuse the risk of donor site morbidity of a major autologous flap, may favor this method. Likewise, patients who wish future pregnancy may potentially select an implant-based reconstruction, rather than autologous reconstruction with an abdominal flap.

Patients who desired to undergo a prophylactic contralateral mastectomy at the time of their therapeutic mastectomy may be suitable nominees for prosthetic reconstruction, as a symmetric bilateral implant reconstruction is easier to attain. Patients with large breast volume and significant ptosis, may possibly need a matching process of the opposite breast [32-34].

Prosthetic breast reconstruction can be done in one step, applying a permanent implant, commonly in combination with acellular dermal matrix [34].

However, in the majority of patients a far more reliable procedure involves two-stage

(tissue expander to implant) reconstruction is used [36,37]. This procedure involves placement of a temporary tissue expander at the time of immediate breast reconstruction or in the first stage of delayed reconstruction. It is used mainly when there is inadequate tissue after mastectomy, or more commonly, when the preferred size and shape of the breast cannot be all right or probably attained in a single stage procedure. Potential stress retained on the mastectomy skin flaps by a fully filled saline implant or silicone implant introduced in one stage is also eluded by this staged method design.

Shortage of sufficient breast skin envelope to cover an implant is regarded a contraindication for prosthetic breast reconstruction. This may be the case when a large skin excision is executed because of former biopsies and/or locally advanced disease, preventing the main coverage of the implant. In such cases, autologous reconstruction may be designated [38].

5.2. Breast augmentation

Breast augmentation is one of the most implemented aesthetic surgical procedure. Selections of incisions, pocket plane, and myriad implant characteristics represent the basis for surgical planning. Analysis of physical features and inclusion of the patient in implant selection contribute to general satisfaction and decrease needs for secondary surgery. Technical expertise in implant locating and aseptic handling helps to avoid capsular contracture, implant malposition, and other shape problems [39].

One of the most significant factors in the dynamics recognized between the implants and the soft tissues after breast augmentation is the pocket plane. Surgeons have been looking for the appropriate plane into which the implant might be located. The sub-glandular approach resulted in implant edge visibility and was supposed to result in a higher incidence of fibrous capsular contractures. In spite of the benefit of concealing the implant edges applying the subpectoral method, implant displacement happened with contraction of the pectoralis muscle. The use of the retro-fascial plane appears to yield the advantages of both planes without the shortages. The sub-fascial breast augmentation procedure offers better long-term aesthetic outcomes because the dynamics between the implant and soft tissues have been adjusted. This approach is tremendously adaptable and may also be performed in patients needing elimination and replacement of breast implants [40].

6. Autologous Tissue Reconstruction

While the implant- reconstructive procedures may lead to a flat contour or asymmetric look of the reconstructed breast, breast reconstruction with autologous tissue flaps can usually accomplish more natural outcomes. This type of procedure also results in a stronger outcome compared with prosthetic reconstructions, which may weaken over time due to capsular contracture. Outcomes can be durable with less requirement for revision after weight gain or loss.

Moreover, there may be less necessity to modify the reverse breast because the autologous tissues are usually adjustable in size and shape, permitting the surgeon to generate a breast mound that can appropriately match the contralateral breast.

Any patient with excess skin and fat in an autologous tissue flap donor site is a nominee for this method. The best candidate is a patient with greater volume ptotic breast, moderate BMI, and who is capable to accept budding donor site morbidity. Autologous tissue breast reconstruction can be effectively achieved with good results in a variety of breast volumes and also in bilateral reconstruction [41-43].

Furthermore, autologous tissue breast reconstruction is a longer operation with longer recovery than prosthetic reconstruction. This technique brings specific risks, such as: scarring, contour deformity, and donor site morbidity (weakness or hernia) depending on the type of flap chosen. In the case of breast reconstruction needing microsurgical tissue transfer, there is the integral risk of whole flap loss [44].

There are two main donor sites; the anterior abdominal wall and the thigh/buttock region. Every one of these regions offers for a number of flaps that are efficiently employed in breast reconstruction.The lower abdomen is the most commonly consumed donor site for autologous tissue breast reconstruction, permitting for enhancements in abdominal contour similar to abdominoplasty. There is no basis in selecting the category of abdominal flap, as each choice has compensations, difficulties, and risks. In patients where the abdomen is inappropriate donor site, autologous breast reconstruction can be pondered from substitute donor sites. These comprise gluteal flaps, Rubens flap, and inner thigh flaps [45].

Microvascular autologous breast reconstruction: The growth of microsurgical techniques has directed to important technological, scientific, and clinical developments that have rendered these techniques safe, reliable, reproducible, and routine in most medical centers. In most occasions, free flap reconstruction has become the main reconstructive procedure for several major disorders, comprising breast reconstruction. The benefits of free flap breast reconstruction include broader patient selection, better flap vascularity, easier in location of the flap, and reduced donor site morbidity. Free flap breast reconstruction can take place either at the time that the mastectomy is done or as a delayed reconstruction following a preceding mastectomy. Immediate reconstructions have the benefit of eluding scar contracture and fibrosis within the mastectomy flaps and at the recipient vessel site. The most mutual recipient vessel sites are the thoracodorsal vessels and the internal mammary vessels. The thoracodorsal vessels are most often used in immediate reconstruction because they are partially exposed in the course of the mastectomy process. The internal mammary vessels are used more commonly in delayed reconstructions, to evade recurrence surgery in the axilla. This recipient site also permits more medial settlement of the reconstruction. Free flap autogenous breast reconstruction

offers a natural, long-lasting outcome with a high degree of patient satisfaction [46].

Currently, the mostly applied flap from the donor site is the deep inferior epigastric artery perforator flap. If the lower abdomen is not accessible as a donor site, the gluteal area and thigh offer a number of flaps appropriate for breast reconstruction. If the needed breast volume is small, and there is sufficient tissue accessible on the upper medial thigh, then a transverse upper gracilis flap may be a feasible approach to reconstruct the breast. In case of a higher amount of required volume, a gluteal artery perforator flap is the preeminent selection. What is important in addition to choosing the best flap selection for the distinct patient is the timing of the operation. In patients with confirmed post-mastectomy radiation therapy, it is suitable to do microvascular breast reconstruction only in a delayed approach [47].

7. Combined Implant and Autologous Reconstruction

Prosthetic breast reconstruction can be combined with an autologous tissue flap allowing for coverage of a tissue expander or implant. The most mutual choice in this situation is the latissimus muscle flap. Benefits of this technique comprise better-quality breast mound projection, as well as a reduced contracture level. A single stage reconstruction with latissimus flap and a stable implant is a common reconstructive option [48,49].

Autologous tissue may be favored in such patients. Alternatively, in women interested in prosthetic reconstruction, a latissimus flap can be combined with implants, either in an immediate or delayed reconstruction situation. This methodology can fillful the required skin coverage in cases treated with post mastectomy radiation while subsiding the complication level. An autologous flap, when combined with an implant for breast reconstruction, seems to decrease the frequency of implant-related complications in formerly irradiated breasts [50].

8. Breast Reconstruction in Saudi Arabia: Surgeon Perceptions and Patient Acceptance

Breast cancer accounted for about 23% of all the newly diagnosed female cancers in Saudi Arabia [7], with an increasing in the incidence among younger population, regularly presents as advanced histological grades and in progressive clinical stages [51,52]. As Post-mastectomy breast reconstruction surgery had always been fundamental part in the approach to a patient with breast cancer, the situation is greatly differ in Saudi Arabia. With lack of studies in this context from Sudan Arabia, we found study from Saudi Arabia, which assessed the perception and practice by surgeons in regard to breast reconstruction in Saudi Arabia. About 70.6% of the surgeons had a special interest in breast cancer management of whom 35.5% referred their patients for breast reconstruction. It was noticed that the surgeons of high-referral tendency were mostly females (P=.016). A round 64.7% of the surgeons believed that a general surgeon is the one in charge for counseling patients. Approximately 41.2% reported that patients refused such type of surgery. In Saudi Arabia, general surgeons have a high anxiety

towards covering local recurrence of the cancer in spite of the deficiency of proof in the available reports. On the other hand, less than half of the surgeons referred their cases for breast reconstruction. This single study in regard to the attitude and practice of surgeon, indorse the fusion of national efforts to raise the awareness toward the benefits of breast reconstruction for patients as well as oncologists, general, and plastic surgeons [53].

The other study in this context from Saudi Arabia, has assessed the factors that influence the desire to employ breast reconstruction following mastectomy, and the barriers to reconstruction among women in Saudi Arabia. Approximately 16.5% of patients experienced breast reconstruction afterward mastectomy. Young age and high educational attendants were significantly associated with an increased wish to undertake reconstruction. The chief obstructions to reconstruction were the lack of sufficient information on the process (63%), fears on the complications of the technique (68%), and anxieties on the reconstruction interfering with the discovery of recurrence (54%).

Furthermore, adaptable barriers including the lack of knowledge and misconceptions on the reconstruction procedure. Addressing issues such as: including the lack of knowledge and misconceptions on the reconstruction procedure may increase the rate of breast reconstruction in Saudi Arabia [54,55].

8.1. Patient's Education

The days following a diagnosis of breast cancer are extremely worrying for patients. Most patients when looking back recognize this period of medical schedules and treatment decisions as the most psychologically hard time of their breast cancer experience. Patients are submerged with information at a time when due to worry accurate to the condition, they cannot wisely speculate and process the discussions as well as they might else. Understanding the language of medicine and science, meeting some physicians, and trying to navigate complex associations and systems, patients regularly are confused and scared. Patients who are medically oriented may have the reverse problem of knowing too much as they attempt to take the best choices regarding surgery. Patient's values and preferences must be considered when discussing the risks/benefits of various reconstructive decisions, including no reconstruction. Elements such as: pamphlets, audio or video recordings, or computer-based interactive programs are useful for the women to take her decision. Guidelines for physicians to use in helping patients identify the decisions that are best going with women's specific preferences and requirements [56].

Busy physicians may find it hard to spend the more time and effort that patients require to make the best choices for themselves. Investing that time will likely produced an increased patient satisfaction with the process and results. Therefore, patients' awareness should be considered as strong factor, particularly in case of Saudi Arabia.

9. Conclusion

Advances in prosthetic technologies and modifications in autologous flap techniques, and the development of novel tissue alternatives have allowed for sustained developments in breast reconstruction results. In the future, many new choices and procedures may be expected, which will have a considerable impact on reconstructive breast surgery, including new biologic tissue matrices, oncoplastic surgery, nipple sparing mastectomy, diverse methods of radiation therapy, neoadjuvant chemotherapy, long term hormonal treatment, and the use of angiogenesis inhibitors. There is no right procedure that can be accepted as the standard; rather, the choice should be personalized depending on patientrelated and oncological factors. Autologous tissue reconstruction may be favored based on relative permanency of its outcomes and removal of dependence on a permanent prosthesis; while a prosthetic reconstruction may be preferred as a less invasive method that is largely well accepted. Regardless of the procedure selected, the main objective of breast reconstruction is to improve patient satisfaction, selfimage and hopes, whereas decreasing morbidity.

A variety of attitudes has been accessible for addressing the difficulties that endure after resection of breast cancer in Saudi Arabia. Patients should be educated to accept different process in this context. Long-standing follow-up is essential after all of the above procedures for breast reconstruction, not only due to the cancer recurrent risk, but because there is anopportunity that extra revision surgery will be desired. Moreover, patients should be educated that, though these methods are termed breast reconstruction, the resultant breast will never have the same feel, look, or sensation of a natural breast. It is possibly best thought of as an internal breast prosthesis which, if well done, imitates the look of the natural breast.

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