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Breast Oncoplasty - A New dimension in the Surgical Management of Breast Cancer

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Abstract : The availability of effective multiple systemic therapy options and early detection of breast cancer; leading to improved quality of life has led to amalgamation of inter professional cross speciality – Breast Oncoplasty. Post mastectomy total breast reconstruction is generally offered to stage I/II breast cancer patients and is often done at the time of mastectomy or after a delay as a second option. Post mastectomy total breast reconstruction can be done using implants or flaps or as a combination of flaps and implants. Oncoplastic procedures following Breast conservation surgery can be equally challenging trying to achieve breast conservation along with adequate tumor clearance and maintaining breast's shape and contour.

Keywords: *Breast reconstruction, Breast implants, myocutaneous flaps, Breast conservative surgery.*

Introduction

Breast cancer poses a dual threat to women - attacking their lives as well as their femininity. Most of the current surgical procedures[1,2] for breast cancer cause permanent loss or disfigurement of breast leading to physical and psychological morbidity[3]. As the long term survival of breast cancer patients is increasing with early detection and availability of effective multiple systemic therapy options the focus of therapy is gradually shifting towards improving the quality of life. The modern breast surgeon can play a crucial role in minimizing the physical disfigurement and improve quality of life of breast cancer patients. Breast Oncoplasty is an emerging subspeciality of surgical oncology which deals with post mastectomy breast reconstruction and minimizing disfigurement following breast conservative surgery using various oncoplastic surgical techniques. Plastic and oncological breast surgeries are becoming more and closer as one surgical treatment. The term "Breast Oncoplastic surgery" refers to the use of plastic surgery techniques in breast cancer surgery in order to avoid and to correct the adverse aesthetics effects. The principals of oncoplastic surgery of the breast are based on minimal scarring and producing optimal size and shape. The concept of dedicated breast surgeon well versed with resection and reconstruction techniques is catching up in the west and inter professional, cross specialty (Breast and Plastic surgery) training fellowships are being offered in most of the high volume breast centers.

There are three clinical settings for Breast Oncoplasty –

1. Post Mastectomy Total Breast Reconstruction (PMTBR),
2. Oncoplastic Procedures following Breast Conservation Surgery and
3. Correction of asymmetry relative to the contra lateral breast[4].

Post Mastectomy Total Breast Reconstruction (PMTBR) :

In the last two decades, breast reconstruction has progressed from a rarely requested procedure to one that is an integral part of a woman's breast cancer management when local treatment for her disease is considered. The development of new techniques and their application by well-trained breast surgeons have resulted in more natural and aesthetically acceptable reconstructions. Experience over the past twenty years has demonstrated that breast reconstruction is a safe and reliable operation; it does not hide local recurrences and does not accelerate the rate or risk of breast cancer spread. In addition, breast reconstruction yields positive psychological benefits for many women, offering them a sense of normality, a "return to wholeness," and an opportunity to put the cancer experience behind them[5].

Selection and Timing of Breast Reconstruction

A woman's motivation and desire for a breast reconstruction are the most important factors before an assessment for reconstruction is made. Patients with stage I and II breast cancer not suitable or not desirous of breast conservation therapy are generally offered PMTBR. This operation can be performed immediately at the time of the mastectomy (Primary Breast Reconstruction) or after a delay as a second operation (Secondary Breast Reconstruction). Primary breast reconstruction has become an appealing option for women undergoing mastectomy, and they are choosing it with greater frequency because it combines a proven treatment for breast cancer with immediate breast restoration. This approach ameliorates the woman's experience of breast loss and the psychological and physical problems. It usually does not interfere with or delay adjuvant chemotherapy. Primary breast reconstruction often permits shorter incisions with less skin removal. By preserving certain breast landmarks such as the inframammary fold, the result may also be better balanced than secondary breast reconstruction. Only one hospitalization, one anesthesia, and one rehabilitation are necessary with this approach. Immediate breast reconstruction does not imply, however, that the entire reconstruction is completed in one procedure; additional operations are usually needed to rebuild the nipple-areola and to achieve the best aesthetic results. For some women secondary breast reconstruction is the only option - women who have had their mastectomies earlier before they knew that breast reconstruction was possible. And some breast cancer patients may choose a delayed procedure because they do not have access to a surgical expertise or because they prefer to approach their treatment one step at a time, first completing the cancer therapy and then after an appropriate interval having their breast reconstructed.

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Types of Post Mastectomy Total Breast Reconstruction (PMTBR):

There are basically three types of PMTBR

1. Implant based PMTBR
2. PMTBR using flaps
3. PMTBR using a combination of implants and flaps.

Implant Based PMTBR:

The silicone gel-filled breast implant was first developed in 1963 for women with small breasts who desired breast augmentation. The same technology was later applied to breast reconstruction to restore the breast shape and contour in women who had mastectomies.

Implants can be used alone or in combination with tissue expanders. For women following mastectomy, these devices have represented the simplest, most economical, least time-consuming approach to breast restoration. Despite the long experience with breast implants, they have become the source of widespread controversy, publicity, and misunderstanding during the past few years due to investigations by FDA regarding the role of silicone in inducing connective tissue disorders. Saline-filled implants are now most frequently used for breast reconstruction. The major drawback of implant based reconstruction procedures is a high morbidity. The reported rates of morbidity range from 30 to 50%[5]. The most frequently encountered morbidities include capsular contracture, implant rupture, displacement, extrusion and infection. In addition implant based reconstruction results in suboptimal outcome in patients with medium to large breasts. Due to these factors implant based reconstructions are ideally suited for breast augmentation and PMTBR in elderly patients with small breasts who are keen for PMTBR but not suitable for complex flap surgeries.

PMTBR using Flaps:

Advances in breast reconstruction during the past decade now offer women the option of having breast reconstruction with their own tissues (autologous) without the need for breast implants or expanders. Musculocutaneous flaps permit the transposition of substantial amounts of skin, underlying fat, and muscle from the back, lower abdomen, or buttocks to the chest area for breast reconstruction. Flap reconstructions are particularly helpful in situations in which skin is needed to rebuild a woman's missing breast. With immediate breast reconstruction, the use of a flap can often permit the creation of a breast that is symmetrical with the opposite breast without modifying it. The most commonly used flaps for PMTBR are Rectus abdominis based flaps – TRAM flap (Transverse rectus abdominis myocutaneous flap) VRAM flap (Vertical rectus abdominis myocutaneous flap). Rectus based flaps can be used as pedicle flap, free flap (micro vascular tissue transfer) or as a supercharged flap (pedicle with micro vascular augmentation). Rectus based flaps are ideal for reconstruction of medium to large breasts in parous women with lax lower abdominal tissues. Since these flaps are harvested in supine position most surgeons prefer rectus based flaps for PMTBR. Abdominoplasty is an added benefit to these patients. The Rectus based flap operations are complex and requires the skill of an experienced surgeon as well as a properly selected patient who understands the magnitude of the operation. The second most common flap used for PMTBR is Latissimus dorsi (LD) based flap. However the volume of tissue available with LD flap is relatively less in comparison to rectus based flaps. Recent advances in surgical techniques using extended LD flap[6] has allowed to increase the volume of tissue harvested and facilitated PMTBR even in patients with medium to large breasts. Another popular option is the usage of a combination of implant and LD flap. By combining both the volume of the reconstructed breast can be increased and the incidence of implant related morbidity can be decreased. Gluteus Maximus Musculocutaneous Flap with microsurgical transfer is the most technically demanding of all breast reconstruction techniques. It is also prone to more serious complications, because it takes longer to perform and usually requires an extended hospital stay. Inset of the flap in the breast requires additional breast scars, and the donor scar is in the buttocks area. Liposuction may also be needed to contour the opposite buttock for symmetry.

Skin Sparing Mastectomy (SSM):

Toth and Lappert[7] described skin sparing mastectomy in 1991 which maximized breast skin preservation and resulted in a superior aesthetic appearance and patient satisfaction following PMTBR. The concept of SSM challenges the excess and unnecessary removal skin during mastectomy with out sound oncologic basis. By preserving the uninvolved skin the aesthetic out come of PMTBR can be improved significantly especially the creation of infra mammary crease with ptosis and preservation of skin sensation. However a good patient selection and meticulous surgical technique are crucial for an optimal oncologic and cosmetic out come. Further refinements have facilitated Nipple areola sparing SSM in select group of patients[8].

Nipple Areola Reconstruction:

Nipple-areola reconstruction contributes to a natural and realistic breast appearance and is usually performed during a separate procedure about 3 to 6 months after the breast reconstruction, once satisfactory breast symmetry has been obtained. The nipple is usually reconstructed with tissues available at the site of the new nipple. New reconstructive techniques use the skin and subcutaneous tissue of the breast mound to create a nipple with satisfactory projection. The nipple can also be reconstructed with a graft taken from an opposite nipple. The areola is reconstructed so that it is symmetrical and similar in diameter and color to the areola of the opposite breast. The most common method now relies on the use of a tattoo to create the semblance of an areola without the need for a skin graft.

Oncoplastic Procedures following Breast Conservation Surgery:

Breast-conservation therapy with lumpectomy is a valuable component of breast cancer treatment, with an equivalent survival outcome to that of mastectomy[2]. In addition to physical preservation, women who undergo breast conservation have a better body image, are more comfortable with nudity and breast caressing, and might have less adverse physical sequelae than mastectomy[9]. However, for breast conservation to be effective, surgeons need to remove cancers completely with an adequate surgical margin width and maintain the breast's shape and appearance. The undertaking of both goals together in the same operation can be challenging, depending on the tumor location and relative size in the breast. If a large lesion is located in a small breast (poor tumor breast ratio) or in patients with lesions located in upper and central quadrants of breast and loss of more

than 30% of breast volume the cosmetic outcome following breast conservation therapy is inferior due to significant disfigurement of treated breast. Recently special plastic surgical approaches have been described to improve the cosmetic out come in such patients.

Three types of oncoplastic surgical techniques are described to manage post breast conservation surgical defects 1) Volume displacement techniques, 2) Volume displacement with mammoplasty and 3) Volume replacement technique using Mini latissimus dorsi flap (MLDF). In volume displacement methods the adjoining uninvolved vascularized breast parenchyma is mobilized in to the partial mastectomy defect and in volume replacement method a mini LD flap is used to obliterate the defect[10,11]. Avoidance of poor cosmetic appearance after wide excision by oncoplastic methods will increase the number of women who can be treated with breast-conserving surgery by allowing larger breast excisions with improved cosmetic results that potentially achieve widened surgical margins around the cancer.

Conclusion :

Evolution of breast cancer surgery during the last century has witnessed many mile stones. Radical ablative surgery for control of cancer was widely practiced during the early part of the century and during the 70s and 80s Breast conservation therapy has emerged as the treatment of choice for early breast cancer. Early detection and effective locoregional and systemic therapy options have improved breast cancer survival and the current emphasis is on quality of life issues. Recent exciting developments in the field of oncoplastic breast surgery will play a major role in the surgical management of breast cancer in future[12]. We at our center offer the whole range of breast oncoplasty procedures to breast cancer patients and in future more high volume breast cancer centers in India should initiate breast oncoplasty programs.

References

1. Fisher B, Redmond C, Fisher ER et al. Ten year results of randomized clinical trial comparing radical mastectomy and total mastectomy with or with out radiation. N Eng J Med 1985; 312: 674-681.
2. Veronesi U, Banfi A, Del Vecchio M et al. Comparison of Halsted mastectomy with quadrentectomy axillary dissection and radiotherapy in early breast cancer; long term results. Eur J cancer clinical oncol 1986; 22:1085-1089.
3. Weitzner MA, Meyers CA, Stuebing et al. relationship between quality of life and mood in long term survivors of breast cancer treated with mastectomy. Support Care cancer 1997:5:241-248.
4. Baildam A D. Oncoplastic surgery of the breast. British J Surg 2002; 89:532-533.
5. Bostwick J. Breast Reconstruction following Mastectomy. CA Cancer J Clin; 1995: 45: 289-304.
6. Chang DW, Youssef A, Cha S et al. Autologous breast reconstruction with the extended latissimus dorsi flap. Plast Recon Surg 2002:110:751-762.
7. Toth BA, Lappert P. Modified skin incision for mastectomy: the need for plastic surgical input in preoperative planning. Plast Recon Surg 1991; 87: 1048-1053.
8. Simmons RM, Brennan M, Christos P et al. Analysis of nipple areola involvement with mastectomy: can the areola be preserved? Ann Surg Oncol 2002; 9:165-168.
9. Schover LR. Sexuality and body image in younger women with breast cancer. *J Natl Cancer Inst Monogr* 1994: 177–82.
10. Anderso BO, Masetti R, silverstein M. Oncoplastic approaches to partial mastectomy: an overview of volume-displacement techniques. Lancet Oncology 2005; 6: 145-157.
11. Gendy RK, Able JA, Rainsbury RM. Impact of SSM with immediate reconstruction and breast sparing reconstruction with mini flaps on the outcome of oncoplastic breast surgery. British J Surg 2003; 90:433-439.
12. Dobson AR. Subspecialty of oncoplastic breast surgery is needed to meet demand. BMJ 2003; 326:1165-1167.

Drug Profile

Pregabalin

Pregabalin-a new neuromodulator, is a novel compound that has analgesic, anticonvulsant, and anxiolytic effects. Pregabalin (3 isoboutyl & aminohutyricacid) is a anolog of major inhibitory neurotransmitter GABA, but is functionally unrelated to it. Pregabalin does not bind to GABA or GABAB receptors and is not converted metabolically to GABA or to GABA agonist. Pregablin's pharmacologic properties are the result of presynaptic binding to the alpha, 2-delta subunit of voltage sensitive calcium channels.

Pharmacokinetics : After oral administration, pregabalin is quickly and extensively absorbed and displays linear pharmacokinetics. Maximal plasma concentrations were achieved in approximately one hour. The extent of absorption is independent of food intake. It is not bound to plasma proteins. More than 90% of drug is eliminated unchanged in urine; elimination half life is approximately 6 hours. Dose reduction is required in patients with GFR<60 ml/min. For haemodialysis patient, a supplemented dose of 25-100 mg is required immediately after dialysis. No dose adjustment is required in hepalic impairment.

Indications : It is effective in neuropathic pain associated with post herpetic neuralgia diabetic peripheral neuropathy, in partial epilepsy as adjunctive therapy, in generalized and social anxiety disorders.

Adverse Effects : Most adverse events caused by pregabalin are mild to moderate in intensity and occur with in 1st or 2 week of treatment. Somnolence and dizziness are most common side effects. Peripheral oedema, ataxia, headache, asthma, infection, mouth dryness, diarrhoea are some of in frequent side effects. It is also associated with a dose related weight gain in 14% of cases. Other adverse effects include peripheral edema, blurring vision, decreased libido, ataxia, impaired memory, paresthesias, euphoria etc.

Warning & Precautions : Dizziness and somnolence associated with pregabalin treatment may increase after injury in elderly people who should avoid driving or operating complex machinery; drug should not be used during pregnancy, in lactating mothers; the drug may potentiate the effects of ethanol and lorazepam.

Dosage : The drug is administered 2-3 times daily; starting a dose of 150 mg/day; the recommended effective dose in 300-600 mg/day. The therapatuic effect is usually observed during the first week of treatment; dose reduction is needed in elderly patients.

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