East African Medical Journal Vol. 98 No. 10 October 2021

AUTOLOGOUS BREAST RECONSTRUCTION FOLLOWING SURGERY FOR BREAST CANCER IN A LOW RESOURCE COUNTRY

Olawoye Olayinka Adebanji, Department of Surgery, College of Medicine University of Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan, Michael Afieharo Igbibia, Department of Surgery, College of Medicine University of Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan, Ayandipo Omobolaji Oladayo, Department of Surgery, College of Medicine University of Ibadan, Division of Oncological Surgery, Iyun Ayodele Olukayode, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan. Ademola Samuel Adesina, Department of Surgery, College of Medicine University of Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan, Oluwatosin Odunayo Morohunfolu , Department of Surgery, College of Medicine University of Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan, Oluwatosin Odunayo Morohunfolu , Department of Surgery, College of Medicine University of Ibadan, Department of Plastic, Reconstructive and Aesthetic Surgery University College Hospital Ibadan.

Corresponding author: Dr. Olawoye Olayinka Adebanji, Department of Surgery, College of Medicine University of Ibadan, Department of Surgery University College Hospital PMB 5116 Ibadan Nigeria. Email: yinkaolawoye@yahoo.co.uk

AUTOLOGOUS BREAST RECONSTRUCTION FOLLOWING SURGERY FOR BREAST CANCER IN A LOW RESOURCE COUNTRY

O. O. Adebanji, M. A. Igbibia, A. O. Oladayo, I. A. Olukayode, A. S. Adesina and O. O. Morohunfolu

ABSTRACT

Background: Mastectomy remains an important treatment modality for breast cancer. One of the factors responsible for late presentation of patients with breast cancer in many low resource countries is the fear of having the breast removed. Studies have supported the role of reconstruction in cancer treatment by demonstrating its positive influence on psychosocial and emotional well-being.

Objective: We present our experience with immediate and delayed breast reconstruction with autologous tissue at the University College Hospital Ibadan, Nigeria.

Design setting: This was a retrospective study of breast cancer patients who had immediate and delayed reconstruction with autologous tissue following mastectomy over a five-year period from September 2015 to August 2019 at our institution.

Materials and methods: Following evaluation of the patients, the options available for the breast reconstruction was discussed with them. The biodata of the patients, the outcome of each surgery and other relevant information were extracted from the case notes.

Results: Eight reconstructions in 7 patients who had mastectomy for breast cancer were included. Unilateral reconstructions were done in 6 patients and a bilateral reconstruction in one patient. All the patients had satisfactory outcome.

Conclusion: Careful selection of donor site based on patient's habitus is necessary for satisfactory outcome. Post mastectomy reconstruction of the breast should be included during counselling of breast cancer patients at the time of their diagnosis *Recommendation*: Advocacy for breast reconstruction and Interdisciplinary care of breast cancer patients with oncologic surgeons should be encouraged in order to increase the uptake for breast reconstruction surgeries.

INTRODUCTION

Cancer of the breast is one of the most common malignancies among females. Unlike other cancers, the self-consciousness of the females is significantly affected with the disease¹. There is a world-wide variation in the incidence of cancer of the breast which range from 25.9 women out of every 100,000 every year in South Central Asia to 94.2 out of every 100,000 women in New Zealand and Australia. The highest incidence in Africa in 2018 was recorded in North Africa with a figure of 48.9 out of every 100,000 women whereas the lowest incidence of 27.9 out of 100,000 women was recorded in Middle Africa. The Southern, Eastern and Western Africa had incidence of 46.2, 37.3 and 29.9 per 100,000 respectively². Female breast cancer is a significant cause of morbidity and mortality in Nigeria with incidence ranging from 36.3 to 50.2 per 100,000 live births³ There has been a progressive rise in the number of women who are at risk of developing breast cancer from about 24.5 million in 1990 to about 40 million in 2010. This figure is projected to rise further to over 50 million in 2020⁴. In Nigeria, 26,310 new cases of breast cancer were diagnosed in females in 2018. This represented 37% of all cancers diagnosed that year⁵. Mastectomy is still one of the most effective options in the holistic care of female patients with breast cancer⁶

The removal of a breast can have significant consequences in women. These include

psychological disturbances which may hinder them from social engagements which may progress to isolation with potential adverse effects on their families and social cycle⁷

There are several anatomic and physiological deficits that follow mastectomy, these include loss of the breast mound with its effects on choosing appropriate clothing, sensory deficit of the skin and the inability to breast feed.8 While it is possible to correct the absence of breast with prosthesis, this may be attended with significant discomfort especially in patients with large breasts. The other effects of mastectomy may include psychosocial dysfunction such as depression, anxiety and deranged sexual function.9 Although reconstruction of the breast is unlikely to solve most of the challenges caused by mastectomy, it no doubt can solve some of them such as increased options and variety of clothing that can be worn and greater confidence to participate in recreational activities without revealing signs of her operation. The purpose of reconstruction include restoration the breast mound and improved quality of life while still allowing the ability to detect any recurrence of the disease.^{10,11} The patient is also able to return to productive life and reciprocal support and interaction with her friends and family. This is so important because many breast cancer patients are in their active and productive stage in life and will be able to contribute their quota to the development of the society.7 Previous studies suggest that reconstruction of the breast improves femininity, sexuality, and body image. The patient's quality of life is also enhanced^{10,12} There are two major stages involved in breast reconstruction, these include the reconstruction of the breast mound and the restoration of the nipple-areolar complex. The breast mound can be reconstructed with autologous tissue or implants depending on a number of factors such as the size and shape of the breast, the type and location of the tumor, the age of the patient, the comorbidities and the adjuvant care that will be suited for the patient. The factors that are considered in making the final choice of the technique to be used include a combination of these factors and the patient's preferences.^{13,14}

Breast reconstruction surgeries have been on the increase in the United States with a total number of 101,657 operations performed in 2018.¹⁵ There are currently no national figures for the rate of breast reconstruction surgery in Nigeria as not many centers perform the operations routinely. The aim of this paper was to present our experience with autologous breast reconstruction at the foremost tertiary health institution in Nigeria.

METHODS

We conducted a retrospective study of breast cancer patients who had immediate and delayed reconstruction with autologous tissue following mastectomy over a five-year period from September 2015 to August 2019 at our institution. The patients were evaluated and the options available for the breast reconstruction in keeping with their body habitus was discussed with them. Informed consent for the respective procedures were obtained from the patients in compliance with the Helsinki declaration before the procedure.

We reviewed the clinical records of these consecutive patients who had immediate or delayed reconstruction of the breast using autologous tissue following mastectomy. The demographic, clinical and operative records were retrieved.

Patients who had immediate breast TRAM reconstruction with flap had concurrent surgery in the supine position with two team of surgeons, the oncologic surgeons the mastectomy and performing the reconstructive surgeons starting by raising the TRAM flap from the abdomen while the patients who had immediate reconstruction with the LD or the extended latissimus dorsi (ELD) flap had sequential surgeries with the oncologic surgeons first performing the mastectomy in the supine position and then the LD or ELD flap harvest by the reconstructive surgeons in the left or right lateral position depending on the side that was reconstructed. The reconstruction was then completed in the supine position. The patients were followed up for periods ranging from 3 months to 4 years.

RESULTS

Of the 277 mastectomies that were done for breast cancer in our institution over the study period, 12 breast reconstructions were done in eleven patients giving a breast reconstruction rate of 4.3%.. Four of the reconstructions were implant based while the remaining 8 were with autologous tissue. The eight reconstructions in 7 patients who had mastectomy for breast cancer were included in this study. The patients were in the 4th and 5th decades of life with age range 30 to 49 years and a mean age of 40.6 years. Unilateral reconstructions were performed in 6 patients and a bilateral reconstruction was undertaken in one patient. Latissimus dorsi (LD) myocutaneous flap was

used for 3 of the reconstructions, extended latissimus dorsi (ELD) flap for 2 of the reconstructions, while the uni-pedicle transverse rectus abdominis muscle (TRAM) flap was used for the remaining 3.

Six of the reconstructions were immediate while the remaining two were delayed reconstructions. One of the patients who had an immediate unilateral ELD flap reconstruction of the right breast and a balancing breast reduction surgery of the left breast.

One of the patients who had the TRAM flap reconstruction developed hematoma in the abdominal wound 6 weeks after surgery which was diagnosed clinically and confirmed with an ultrasound scan. The hematoma was aspirated in the clinic under aseptic conditions. All the patients expressed satisfaction with the outcome of their surgeries.

| Summury of Patients characteristics and the breast reconstructive surgery performed | | | | | | |
|---|--|-----|-----|-----------------|-------|-----------|
| Patient's | | Age | Sex | Flap type | Side | Timing of |
| Serial | | | | | | surgery |
| number | | | | | | |
| 1 | | 43 | F | LD | Right | Delayed |
| 2 | | 49 | F | Pedicled TRAM + | Right | Immediate |
| | | | | mastopexy (L) | | |
| | | | | breast | | |
| 3 | | 30 | F | LD | Right | Immediate |
| | | | | LD | Left | Immediate |
| 4 | | 38 | F | Pedicled TRAM | Left | Delayed |
| 5 | | 48 | F | Pedicled TRAM | Right | Immediate |
| 6 | | 40 | F | Extended LD | Right | Immediate |
| 7 | | 36 | F | Extended LD | Right | Immediate |

Table 1Summary of Patients' characteristics and the breast reconstructive surgery performed

DISCUSSION

Our results indicated that of the 277 patients who had mastectomy during the study period, only 7 patients had reconstructive surgery. Eniu et al⁶ reported that mastectomy was the most commonly performed surgical treatment of breast cancer in low resource countries (LRC). Reasons such as poor awareness on the part of the oncologic surgeons with subsequent low referrals to reconstructive plastic surgeons appear to be top most. Many ignorant of the patients are equally opportunities for reconstructive breast surgery following mastectomy. Other reasons include

poverty, late presentation and poor support system. The cost of breast cancer treatment, neo and adjuvant care in many low and middle income countries is often borne by the patient and family members (out of pocket pay) because of the ineffective health insurance schemes. This places a high financial burden on the patients making many of them to limit their care to just mastectomy and the required adjuvant care. The fear of recurrence may also be another reason for some patients to choose mastectomy only¹⁶ There may be other reasons especially in the younger women where the disease could be very aggressive, and the tumor size large at the time of diagnosis hence precluding the use of breast conserving surgeries in LRCs^{17,18} In addition to these, the facilities and skills for breast conserving surgery is limited in many LRCs.

То mitigate these highlighted issues, multidisciplinary care for breast cancer which involves the use of conservative surgery in many parts of the world especially in the LRCs been advocated.17 This involves has mastectomy and removal of the lymphatic drainage.¹⁹ Mastectomy alone without breast reconstruction is believed to have significant effect on the quality of life including the psychosocial, cosmetic, sexual, physical and body image^{20,21}

Despite this, Halsted et al suggested the use of skin graft or wound healing by second intention following mastectomy instead of the use of reconstruction to prevent reoccurrence of the cancer.²² However, these options are currently less desirable as the 10-year survival of breast cancer patients following early detection and appropriate treatment is as high as 70%, and up to 60% of women are predicted to live for 20 years following their first diagnosis.²³ The issues of survival and Health Related Quality of life (HRQoL) following surgery and other treatment is receiving greater attention.^{23,24} More recently there has been a higher survival rate in patients with breast cancer even in LRC. Earlier diagnosis and improved access to more potent and effective chemotherapeutic agents in many LRCs appear to be contributing to longer survival of patients.

It is important that surgeons begin to focus also on measures to improve the patients QoL following mastectomy. This will require a multidisciplinary approach to patients care. Immediate reconstruction of the breast following mastectomy enables women to preserve their body image and QoL without adverse impact on survival.²⁵ Several publications have reported that patients undergoing reconstruction of the breast attain positive body image and have less thoughts about recurrence of their disease.²⁶⁻³⁰ The two performing major ways of breast reconstruction implant are based reconstruction and the use of autologous tissue. A combination of use of implant and autologous tissue may also be employed. The operation may also be performed immediately following mastectomy during the same surgery or as a delayed procedure months or years following mastectomy.31

Implant based reconstruction of the breast began in the 1960s and became more popular in the 1980s following the introduction of tissue expanders.³² Breast reconstruction using implants is the most common option of breast reconstruction. There are however limitations with this technique. Some of these limitations include the difficulty in achieving ptotic breast. complications Other include capsular contracture, migration of implants and agerelated changes to the natural breast.³³ In addition, there are peculiar challenges with implant-based breast reconstruction in many LRCs, these include the prohibitive cost of breast implants and other related adjuncts for reconstruction such as breast sizers, acellular dermal matrix etcetera. On the few occasions when breast sizers are used, it is usually a luxury to have more than one size available for a particular surgery. Perhaps a more disturbing challenge is the non-inclusion of breast reconstruction surgery as an operation covered by health insurance schemes in many LRCs hence patients need to make out of pocket payment for such procedures.

A number of studies have found breast reconstruction with autologous tissue to be superior to implant-based reconstructions. ^{27,34} Hartrampf et al introduced the transverse rectus abdominis muscle flap (TRAM) for a one-stage breast reconstruction in order to overcome the complications of implant-based surgery such as migration of the implant, capsular contracture and other complications related to the implant.³⁵ A major advantage of the TRAM flap is its ability to create a natural breast mound which is soft and ptotic and which tends to age naturally. The flap also requires minimal revision with time³⁶ So much progress has been made in the field of breast reconstruction over the past decades. These include techniques in microsurgical surgery to improve blood supply to TRAM flap with resultant decrease in the rates of fat necrosis and other donor site morbidities. These techniques have also enhanced the transfer of autologous tissues from other parts of the body using the concept of perforator flap. This allows flaps for breast reconstruction to be raised with minimal morbidities. A case series of 5 patients from Benin, south-south Nigeria also reported patients' satisfaction with autologous breast reconstruction.37

The body habitus of the patients permitted TRAM flaps in 3 of the patients. None of the 3 patients who had pedicled TRAM reconstructions developed abdominal wall weakness or herniation. One patient however developed hematoma in the abdominal wound 6 weeks post operation which was diagnosed clinically and confirmed with abdominal ultrasound scan. The hematoma was drained aseptically in the clinic with no recurrence. The remaining patients had pedicled LD and ELD flaps. The most common complication in the patients who had LD and ELD flaps was seroma which delayed removal of the suction drain from the donor site. The longest time to removal of the donor site drain for the LD flaps was 21 days.

The deep inferior epigastric artery perforator (DIEP) flap is currently the gold standard for breast reconstruction. as described by Allen and Treece³⁸ The DIEP flap preserves the integrity of the underlying rectus abdominis musculature without the risk of muscle weakness or ventral hernia. It is however more technically challenging, and it requires the use of operating microscope and other consumables that are not readily available in many LRCs. This makes the use of pedicled TRAM and LD flaps more desirable in the LRCs.

Wound healing in the patient who had bilateral reconstruction with LD flaps (Figure 1) was complicated with hypertrophic scars for which silicone sheet treatment was employed. Aside for only one patient who consented to a balancing breast reduction for the second breast, all the other patients who had unilateral reconstructions declined balancing procedures such as fat grafting, mastopexy or breast reduction for the other breast. Nipple-areola reconstruction is yet to be requested for by any of the patients despite counseling for same. It appears as if the patients are satisfied with getting the breast mound back with little or no interest for other cosmetic considerations.



Figure 1 Post-operative picture of the patient who had bilateral breast reconstructions with LD flaps

CONCLUSION

The use of pedicled autologous tissue circumvents the technical challenge and infrastructural limitations of microvascular surgeries in many LRCs and the high cost of implants and related adjuncts such as acellular dermal matrix which are not readily available and accessible in many of these countries. The breast reconstruction rate of 4.3% is rather low and concerted efforts must be made to improve patients' education and advocacy for increased uptake of breast cancer patients for breast reconstruction post mastectomy.

REFERENCES

1. Teymouri H.R., Stergioula, S., Eder, M., Kovacs, L., Biemer, E., Papadopulos, N.A Breast reconstruction with autologous tissue following mastectomy. Hippokratia 2006; 10 (4): 153-162

- Bray, F., Ferlay, J., Soerjomataram, I., Siegel, L.I., Torre, L.A., Jemal, A. Global Cancer Statistics 2018: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries Ca Cancer J Clin 2018;68:394–424
- Jedy-Agba E, Curado MP, Ogunbiyi O, Oga E, Fabowale T, Igbinoba F, et al. Cancer incidence in Nigeria: A report from population-based cancer registries. Cancer Epidemiol 2012;36:e271-8
- Akarolo-Anthony SN, Ogundiran TO, Adebamowo CA. Emerging breast cancer epidemic: Evidence from Africa. Breast Cancer Res 2010;12 Suppl 4:S8
- WHO 2018 Globocan report. Available at: https://gco.iarc.fr/today/data/factsheets/popul ations/566-nigeria-fact-sheets.pdf. accessed September, 9th 2020

- 6. Eniu A, Carlson RW, El Saghir NS, Bines J, Bese NS, Vorobiof D, et al. Guideline
- implementation for breast healthcare in lowand middle-income countries: treatment resource allocation. Cancer 2008 Oct 15;113(8 Suppl.):2269e81.
- Kroll, S. S. Breast reconstruction with autologous tissue. New York, Springer press, ISBN 0-387-98670-7 2000
- Cordeiro PG. Breast reconstruction after surgery for breast cancer. N. Engl J med: Med. 2008; 359 (15): 1590 – 1601.
- Parker PA, Youssef A, Walker S, et al. Shortterm and long-term psychosocial adjustment and quality of life in women undergoing different surgical procedures for breast cancer. Ann Surg Oncol 2007; 14:3078-89.
- 10. Elder EE, Brandberg Y, Björklund T, et al. Quality of life and patient satisfaction in breast cancer patients after immediate breast reconstruction: a prospective study. Breast 2005;14:201-8.
- Howard MA, Polo K, Pusic AL, et al. Breast cancer local recurrence after mastectomy and TRAM flap reconstruction: incidence and treatment options. Plast Reconstr Surg 2006;117:1381-6
- Metcalfe KA, Semple JL, Narod SA. Satisfaction with breast reconstruction in women with bilateral prophylactic mastectomy: a descriptive study. Plast Reconstr Surg 2004;114:360-6
- 13. Saulis AS, Mustoe TA, Fine NA. A retrospective analysis of patient satisfaction with immediate postmastectomy breast reconstruction: comparison of three common procedures. Plast Reconstr Surg 2007; 119:1669-78.
- Roth RS, Lowery JC, Davis J, Wilkins EG. Psychological factors predict patient satisfaction with postmastectomy breast reconstruction. Plast Reconstr Surg 2007; 119:2008-17.
- 15. 2018 Plastic surgery statistics report. Available at:

https://www.plasticsurgery.org/documents/N ews/Statistics/2018/plastic-surgery-statistics-

full-report-2018.pdf. Accessed September, 14th 2020

- Molenaar S, Oort F, Sprangers M, et al. Predictors of patients' choices for breastconserving therapy or mastectomy:a prospective study. Br J Cancer 2004;90:2123-30.
- 17. Adebamowo CA, Ajayi OO: Breast cancer in Nigeria. West Afr J Med 2000, 19:179–191
- 18. El Saghir NS, Adebamowo CA, Anderson BO, et al: Breast cancer management in low resource countries (LRCs): consensus statement from the breast health global initiative. Breast 2011, 20(Suppl 2):S3–S11.
- Ogundiran TO, Ayandipo OO, Ademola AF, Adebamowo CA. Mastectomy for management of breast cancer in Ibadan., Nigeria. BMC Surg. 2013;13:59 doi: 10.1186/1471-2482-13-59 PMID: 24354443
- 20. Lee C, Sunu C, Pignone M. .Patient-reported outcomes of breast reconstruction after mastectomy: a systematic review.J Am Coll Surg2009;209: 123–133
- 21. Waljee JF, Hu ES, Ubel PA, et al. Effect of esthetic outcome after breast-conserving surgery on psychosocial functioning and quality of life. J Clin Oncol. 2008;26:3331–3337
- 22. Unger JG, Saint-Cyr M, Schaverien M, Cheng A. Breast reconstruction. Selected Readings in Plastic Surgery. 2014;11 (R5). Available from <u>http://docplayer.net/30592769-Breast</u> reconstruction.html
- 23. Peto R, Boreham J, Clarke M, Davies C, Beral V. UK and USA breast cancer deaths down 25% in year 2000 at ages 20–69 years. Lancet 2000;355: 1822
- 24. Winters ZE, Thomson HJ. Assessing the clinical effectiveness of breast reconstruction through patient-reported outcome measures. Br J Surg. 2011 Mar;98 (3):323-5
- 25. Golshan M, Cirrincione CT, Sikov WM, Berry DA, Jasinski S,Weisberg TF et al.; Alliance for Clinical Trials in Oncology. Impact of neoadjuvant chemotherapy in stage
- 26. II–III triple negative breast cancer on eligibility for breast-conserving surgery and breast conservation rates: surgical results from CALGB 40603 (Alliance). Ann Surg 2015; 262: 434–439.

- Alderman AK, Wilkins EG, Kim HM, et al. Complications in postmastectomy breast reconstruction: two-year results of the Michigan breast reconstruction outcome study. Plast Reconstr Surg. 2002;109:2265–2274
- Edsander-Nord A, Brandberg Y, Wickman M. Quality of life, patients' satisfaction, and aesthetic outcome after pedicled or free TRAM flap breast surgery. Plast Reconstr Surg. 2001;107:1142–1153. Discussion 1154–5
- 29. Alderman AK, Kuhn LE, Lowery JC, et al. Does patient satisfaction with breast reconstruction change over time? Two-year results of the Michigan breast reconstruction outcomes study. J Am Coll Surg. 2007;204:7– 12.
- Al-Ghazal SK, Fallowfield L, Blamey RW. Comparison of psychological aspects and patient satisfaction following breast conserving surgery, simple mastectomy and breast reconstruction. Eur. J. Cancer. 2000;36:1938–1943.
- 31. Eltahir Y, Werners LL, Dreise MM, et al. Quality-of-life outcomes between mastectomy alone and breast reconstruction: comparison of patient-reported BREAST-Q and other healthrelated quality-of-life measures. Plast Reconstr Surg. 2013;132:201e–209e.
- 32. Juhl AA, Christensen S, Zachariae R, Damsgaard TE Unilateral breast

reconstruction after mastectomy - patient satisfaction, aesthetic outcome and quality of life Acta Oncol

2017 Feb;56 (2) 225-231.

- 33. Collis N, Sharpe DT: Breast reconstruction by tissue expansion: A retrospective technical review of 197 two-staged delayed reconstructions following mastectomy for malignant breast disease in 189 patients. Br J Plast Surg 2000;53:37–41.
- 34. Serletti, JM. Breast Reconstruction with the TRAM Flap: Pedicled and Free J. Surg. Oncol. 2006; 94:532–537.
- Christensen BO, Overgaard J, Kettner LO, et al. Long-term evaluation of postmastectomy breast reconstruction. Acta Oncol. 2011;50:1053–1061
- Hartrampf CR, Soneflan M, Black PW: Breast reconstruction with a transverse abdominal island flap. Plast Reconstr Surg 1982;69:216– 225.
- Ijekeye FO, Nwashilli NJ. Postmastectomy breast reconstruction at University of Benin Teaching Hospital, Benin City. Niger J Surg Sci 2016;26:39-45
- Allen RJ, Treece P. Deep inferior epigastric perforator flap for breast reconstruction. Ann Plast Surg 1994;32:32–38.