Chinese breast cancer surgery: clinical practice and research

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According to GLOBOCAN 2018, the global cancer statistic database by the International Agency for Research on Cancer, breast cancer is the most commonly diagnosed cancer in women.[1] In 2018, more than 2 million new breast cancer cases were reported, with an age standardized rate (ASR) of 46.3 per 100,000, and over 600,000 deaths from breast cancer were estimated, with an ASR of 13.0 per 100,000, worldwide. The number of breast cancer cases continues to increase. In China, more than 270,000 new cases were diagnosed in 2015, with 70,000 reported deaths.[2] In 2018, the number of new cases in the country increased to 367,900.[1] Thus, we urgently need more clinical researches and expert consensus on optimal therapies for breast cancer.

On the basis of clinical evidence, recommendations for early-stage breast cancer surgery have been widely accepted since the 19th century. In 1894, Halsted successfully performed radical mastectomy, involving resection of pectoralis major and minor muscles as well as axillary and subclavian lymphadenectomy, in breast cancer patients, which, for the first time, resulted in local R0 resection of tumors and a 5-year survival rate >40%. Since then, achieving R0 resection has become the aim of breast cancer surgery. However, the necessity for radical mastectomy was challenged with the emergence of the concepts of systemic disease and systemic therapy. The disadvantages of Halsted radical mastectomy in terms of patients' quality of life gradually became evident, and the procedure was abandoned in the 20th century. Instead, breast-conserving surgery (BCS) and sentinel lymph node biopsy (SLNB), supported by high-level evidence focusing on both survival and quality of life, became the preferred choice for the treatment of early-stage breast cancer patients. Nonetheless, the basic principle that R0 resection of the primary tumor and regional lymph nodes must be achieved for successful surgery of early-stage breast cancer has not changed.

In 1971, the United States of America, Canada, and Australia jointly launched the National Surgical Adjuvant Breast and Bowel Project (NSABP), aiming to standardize breast and bowel cancer treatment by conducting prospective, multi-center clinical studies. The NSABP B-04, B-06, and B-32 trials provided high-quality evidence on BCS and SLNB, which laid the foundation for improving surgical techniques for breast cancer. In 2020, the National Comprehensive Cancer Network (NCCN) clarifies indications and contraindications to BCS, SLNB, and breast reconstruction surgery.[3] However, the optimal surgical margins for BCS, the treatment for limited sentinel lymph node (SLN) metastasis, and the usefulness of SLNB for node-positive patients after neoadjuvant systemic chemotherapy (NST) remain controversial.[4]

Molecular subtypes have been widely used in developing individualized treatments for breast cancer since the beginning of the 21st century. In addition to reducing the tumor burden by surgery, the development of cytotoxic, endocrine, targeted, and immune drugs has contributed to individualized treatment on the basis of molecular subtypes. Moreover, improved radiotherapy techniques have led surgeons to re-plan breast surgery to maximize benefits and minimize harm in patients. The safety of omitting axillary lymph node dissection (ALND) in women with positive SLNs, the definition of clear margins of BCS after NST, and the safety of SLNB in patients with positive nodes after NST are still under debate.[5]

Currently, Chinese surgeons are highly concerned about standardizing surgical procedures for breast cancer, including core needle biopsy (CNB), BCS, breast reconstruction, and vacuum-assisted breast biopsy (VABB). As many surgeons in China lack radionuclide certification and patients wish to avoid a second operation, the preferred option is to locate SLNs with the single lymphatic technique and assess margins through frozen pathological diagnosis. Therefore, Chinese doctors are encouraged to improve clinical standardization and conduct multi-center studies on the basis of existing global research findings and domestic conditions.

Access this article online

Quick Response Code:

Website: www.cmj.org

DOI: 10.1097/CM9.0000000000000992

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Chinese Medical Journal 2020;133(19)

Received: 25-04-2020 **Edited by:** Qiang Shi

The Chinese Society of Breast Surgeons (CSBrS), which includes breast surgeons from 41 large-scale hospitals, was established in 2017 to standardize breast cancer treatment and build a platform for multi-center study. By May 2020, ten guidelines on hot topics on breast cancer had been issued.

As diagnosis is the basis of personalized treatment, the 2013 St. Gallen Consensus provided evidence-based treatment recommendations for breast cancer, among which the concept of molecular subtype was included, marking the beginning of a new era in personalized treatment for breast cancer, which could significantly improve prognosis.[6] The NCCN Clinical Practice Guideline highly recommends CNB for suspicious lesions, and other studies have also reported that pre-operative CNB could improve the quality of surgery.[7] However, because of insufficient understanding of the clinical value of CNB, most primary hospitals and even some large general hospitals still insist on open biopsy. Mastectomy is performed on the basis of the results of intra-operative frozen pathological examination, which seriously affects the progress in personalized treatment of early-stage breast cancer in China. In 2019, CSBrS published *Consensus statements and operation guidelines on breast lesions and lymph nodes biopsy guided by ultrasound*,[8] aiming to raise public awareness on the CNB technique.

For patients with benign lesions diagnosed using CNB, the goal is to minimize invasive surgery. VABB has the unique advantages of accuracy, convenience, and minimal incision when handling breast lesions. To promote this technique and avoid complications, CSBrS published *Consensus statements and operation guidelines on ultrasound-guided vacuum-assisted breast biopsy*[9] in 2017. For patients whose lesions test positive for cancer on CNB, the main aim is to maximize quality of life and minimize harm while providing effective treatment. The NSABP-B32 trial[10] found that patients with clinical lymph node-negative breast cancer can safely avoid ALND and lymphedema if SLNs are negative. Because of the unavailability of radionuclide and isosulfan blue, most Chinese doctors use methylene blue or carbon nanoparticles to locate SLNs. To generalize the SLNB technique in early-stage breast cancer, CSBrS published *Consensus statements and operation guidelines on sentinel lymph nodes biopsy in early breast cancer*[11] in 2018. Although it is publicly known that for selected patients with early breast cancer BCS is safe and has a good aesthetic result, the average percentage of BCS is no more than 30% in China. To clarify the indications, contra-indications, and surgical technique of BCS, CSBrS published *A consensus statement on the breast-conserving surgery of early-stage breast cancer*[12] in 2019.

According to the NCCN guidelines, all patients with breast cancer, especially those who need mastectomy, should receive consultation on breast reconstruction before surgery. However, oncologic safety is always the premise of any reconstruction, so reconstruction should have no impact on the timing of oncological surgery and surveillance. Reconstruction surgery with any residual tumor is a failure, regardless of post-operative appearance. Multidisciplinary teamwork is required for successful reconstruction.[13]

As the oncology field develops rapidly, the breast surgery department has become an independent department in both cancer and general hospitals in China. It is now possible to conduct domestic multi-center clinical studies. By 2019, ten multi-center studies on trending topics on breast cancer had been initiated, and more studies have been planned in 2020. CSBrS will make every effort to promote the development and standardization of clinical treatment of breast cancer in China.

Conflicts of interest

None.

References

1. Ferlay J, Colombet M, Soerjomataram I, Mathers C, Parkin DM, Piñeros M, *et al*. Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods. Int J Cancer 2019;144:1941–1953. doi: 10.1002/ijc.31937.
2. Chen W, Zheng R, Baade PD, Zhang S, Zeng H, Bray F, *et al*. Cancer statistics in China, 2015. CA Cancer J Clin 2016;66:115–132. doi: 10.3322/caac.21338.
3. National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology; Breast cancer, version 3, 2020. Available from: http://www.nccn.org/professionals/physician_gls/pdf/breast.pdf.2020-3-6. [Accessed May 22, 2020].
4. Boughey JC, Suman VJ, Mittendorf EA, Ahrendt GM, Wilke LG, Taback B, *et al*. Sentinel lymph node surgery after neoadjuvant chemotherapy in patients with node-positive breast cancer: the ACOSOG Z1071 (Alliance) clinical trial. JAMA 2013;310:1455–1461. doi: 10.1001/jama.2013.278932.
5. Early Breast Cancer Trialists' Collaborative Group (EBCTCG). Long-term outcomes for neoadjuvant versus adjuvant chemotherapy in early breast cancer: meta-analysis of individual patient data from ten randomised trials. Lancet Oncol 2018;19:27–39. doi: 10.1016/S1470-2045(17)30777-5.
6. Goldhirsch A, Winer EP, Coates AS, Gelber RD, Thürlimann B, Senn HJ. Personalizing the treatment of women with early breast cancer: highlights of the St Gallen International Expert Consensus on the Primary Therapy of Early Breast Cancer 2013. Ann Oncol 2013;24:2206–2223. doi: 10.1093/annonc/mdr304.
7. James TA, Mace JL, Virnig BA, Geller BM. Preoperative needle biopsy improves the quality of breast cancer surgery. J Am Coll Surg 2012;215:562–568. doi: 10.1016/j.jamcollsurg.2012.05.022.
8. Chinese Association of Breast Surgery. Consensus statements and operation guidelines on breast lesions and lymph nodes biopsy guided by ultrasound. Chin J Surg 2019;57:404–407. doi: 10.3760/cma.j.issn.0529-5815.2019.06.002.
9. Chinese Association of Breast Surgery. Consensus statements and operation guidelines on ultrasound-guided vacuum-assisted breast biopsy. Chin J Pract Surg 2017;37:1374–1376. doi: 10.19538/j.cjps.issn1005-2208.2017.12.15.
10. Krag DN, Anderson SJ, Julian TB, Brown AM, Harlow SP, Costantino JP, *et al*. Sentinel-lymph-node resection compared with conventional axillary-lymph-node dissection in clinically node-negative patients with breast cancer: overall survival findings from the NSABP B-32 randomised phase 3 trial. Lancet Oncol 2010;11:927–933. doi: 10.1016/S1470-2045(10)70207-2.
11. Chinese Association of Breast Surgery. Consensus statements and operation guidelines on sentinel lymph nodes biopsy in early breast cancer. Chin J Pract Surg 2018;38:855–858. doi: 10.19538/j.cjps.issn1005-2208.2018.08.04.
12. Chinese Association of Breast Surgery. A consensus statement on the breast-conserving surgery of early-stage breast cancer (2019). Chin J Surg 2019;57:81–84. doi: 10.3760/cma.j.issn.0529-5815.2019.02.001.
13. Ye JM, Xin L, Wang Y, Wang Y, Guan S, Liu YH. Breast reconstruction after mastectomy in breast cancer patients: specialization and standardization. Chin J Surg 2019;57:88–91. doi: 10.3760/cma.j.issn.0529-5815.2019.02.003.

How to cite this article: Xin L, Li JY, Yu ZG, Liu YH. Chinese breast cancer surgery: clinical practice and research. Chin Med J 2020;133:2269–2270. doi: 10.1097/CM9.0000000000000992