

Clinical practice guidelines for modified radical mastectomy of breast cancer: Chinese Society of Breast Surgery (CSBrS) practice guidelines 2021

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The proportion of patients with early-stage breast cancer undergoing mastectomy exceeds 70% in China,^[1] among which Auchincloss operation is the major surgical technique for patients with axillary lymph node positive breast cancer. In order to standardize the clinical application of modified radical mastectomy of breast cancer, Chinese Society of Breast Surgery (CSBrS) organized domestic experts to conduct literature retrieval and expert discussion on the theoretical basis and technical details of modified radical mastectomy for breast cancer. With reference to the grading of recommendations assessment, development, and evaluation system, the related evidence was evaluated. Combined with the clinical accessibility, CSBrS breast cancer modified radical practice guidelines were developed to provide reference for the clinical practice of breast surgeons at home.

Level of Evidence and Recommendation Strength

Level of Evidence Standard^[2]

Recommendation Strength Standard^[2]

Recommendation Strength Review Committee

A total of 81 members of the voting committee of this guideline, including 66 breast surgeons (81.5%), four oncologists (4.9%), four radiologists (4.9%), one pathologist (1.2%), one gynecologist (1.2%), two radiation therapist (2.4%), and three epidemiologists (3.7%).

Target Audience

Clinicians specializing in breast diseases in China.

Recommendations

Recommendation 1: indications

Indications	Level of evidence	Recommendation strength
1.1 Early breast cancer not suitable for breast sparing surgery ^[3]	I	A
1.2 Axillary lymph nodes positive ^[3]	I	A
1.3 Clinical evaluation suitable for R0 resection ^[3]	I	A

Recommendation 2: Incision Design

Incision design	Level of evidence	Recommendation strength
2.1 Preferred the horizontal Stewart ^[4] incision*	I	A

*The experts agreed that for patients with difficulty in using horizontal incision, the “S” incision or the “parallelogram method” were recommended to reduce skin tension while keeping the incision relatively concealed.

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Recommendation 3: Free Skin Flap Layer

Free Skin Flap Layer	Level of evidence	Recommendation strength
3.1 The free skin flap should be isolated in the superficial fascia of breast tissue ^[5]	I	A

Recommendation 4: Free Skin Flap Range

Free Skin Flap Range	Level of evidence	Recommendation strength
4.1 Generally, the upper boundary is 1 to 2 cm below the clavicle, the lower boundary is at the level of the costal arch, the medial boundary is at the parasternal line, and the lateral boundary is at the latissimus dorsi leading edge ^[6]	I	A

Recommendation 5: Axillary Lymph Node Dissection Level

Axillary Lymph Node Dissection Level	Level of evidence	Recommendation strength
5.1 Axillary lymph node cleaning only II level (if there is an obvious II or III level of lymph node metastasis, needs cleaning III level) ^[7]	I	A

Discussion

In 1948, Patey *et al*^[8] first reported that the pectoralis major muscle was retained and only the pectoralis minor muscle was removed during Halsted radical surgery, to preserve the better appearance and function of the chest wall. In 1951, Auchincloss *et al*^[9] proposed that both the pectoralis major and minor muscle should be retained, which was called improved radical surgery. In particular, the Auchincloss method can not only achieve the purpose of R0 resection, but also have the advantage of reducing the injury of pectoral innervation nerve, making it more widely used in clinical practice.

The experts discussed the position of the Auchincloss operation, the incision design, the layer and range of free

skin flap, the tissues need to be removed and retained during the operation, surgical techniques, and the management of complications, and reached a consensus (see the appendix for surgical procedures and precautions).

In terms of the treatment of pectoral fascia, traditional surgical procedures require removal of pectoral fascia to prevent metastasis of the tumor through the fascial lymphatic vessels and to remove tumor cells shed during surgery. The experts considered that there was no evidence that removal of pectoral fascia improved local control. Meanwhile, considering that removal of the pectoralis fascia would not have many adverse effects, the experts recommended removal of the pectoralis major fascia after discussion. The second and third intercostal arteries near the sternum have internal thoracic arteries, which should be ligated or electric coagulation hemostasis. The multiple small perforating vessels from pectoralis major muscle are one factor of post-operative hemorrhage, which should be fully stanchied.

In 1955, Berg^[10] divided axillary lymph nodes into three levels based on the upper and lower margins of pectoralis minor muscle, among them, the outside edge of the pectoralis minor muscle was the first I level, the area between the lower and upper edge of pectoralis minor muscle was the first II level, for the first III level within pectoralis minor muscle on the edge (subclavian area). The experts agreed to Auchincloss surgical indication of patient line of the lymph node first II level, it should be removed at least ten or higher lymph node to complete accurate pathology N staging.^[3]

During axillary lymph node dissection, attention should be paid to the protection of the thoracic dorsal nerve accompanying with the thoracic dorsal artery and the long thoracic nerve running close to the chest wall, both of which supply the movement of corresponding muscles. Injury of the former will lead to latissimus dorsi atrophy, while injury of the latter will lead to serratus anterior atrophy and affect the quality of life. The intercostal brachial nerve is the sensation in the medial upper arm. The intercostal brachial nerve is responsible for the sensation in the medial upper arm, excision of the intercostal brachial nerve can cause numbness, hypoesthesia or loss of sensation in this area,^[11] which should be retained during the operation. When it is adhered to the lymph node, it can be excised considering the safety of the tumor.

The common post-operative complications of modified radical resection include post-operative hemorrhage, incision infection, necrosis of skin flap, subcutaneous hydrops, skin paresthesia, and edema of the affected upper limb. Adequate intra-operative hemostasis and continuous post-operative negative pressure drainage can reduce post-operative hemorrhage, subcutaneous hydrops, and lymphedema of the affected upper limb. In recent years, lymphedema of the upper extremity after modified radical surgery has attracted more and more attention. The main cause of lymphedema of the upper extremity is the obstruction of upper extremity lymphatic reflux. Axillary lymph node dissection and radiotherapy are the main

inducement, and the high-risk factors include obesity, post-operative infection, and the formation of axillary seroma.^[12] For patients undergoing axillary lymph node dissection, the measures to prevent upper extremity lymphedema include reducing the formation of axillary seroma, avoiding post-operative infection, improving precise radiotherapy techniques, scientifically guiding upper extremity function exercise, reducing excessive weight bearing on the affected side of the upper extremity and avoiding the induced factors of upper extremity venipuncture on the affected side. Severe upper extremity lymphedema must be treated with a combination of treatments and even surgery.

Conflicts of interest

The expert committee for these guidelines declares no conflict of interest. These guidelines are a reference for breast disease specialists in clinical practice. However, the guidelines are not to be used as the basis for medical evaluation, and do not play an arbitrating role in the handling of any medical disputes. The guidelines are not a reference for patients or non-breast specialists. The CSBrS assumes no responsibility for results involving the inappropriate application of these guidelines, and reserves the right to interpret and revise the guidelines.

Appendix: Surgical procedure of modified radical mastectomy for breast cancer (Supplementary file, <http://links.lww.com/CM9/A478>).

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