



## Evidence-based nipple-sparing mastectomy in patients with higher body mass index: Recommendations for a successful standardized surgery

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### ABSTRACT

Nipple-sparing mastectomy is used with increasing frequency in the multidisciplinary treatment of patients with operable breast cancer. This technique allows to remove the entire glandular tissue preserving the skin envelope and the nipple-areola complex. Common indications to nipple-sparing mastectomy include extensive or multicentric disease, inability to obtain clear surgical margins with breast conserving-surgery, large tumor size with respect to the breast size, as well as cases with contraindications for radiotherapy as well as patient preference. Higher body mass index may cause longer operative times and increased risk of complications such as nipple-areola complex and skin flap ischemia. Repetitive performance of standardized tasks could optimize oncological and aesthetic outcomes and increase the chance of success.

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I read with interest the work of Christopher Webb and colleagues<sup>1</sup> and would like to add some useful suggestions to reduce operative times and optimize oncological and aesthetic outcomes.

Nipple-sparing mastectomy (NSM) is used with increasing frequency in the multidisciplinary treatment of patients with operable breast cancer. This technique allows to remove the entire glandular tissue preserving the skin envelope and the nipple-areola complex.<sup>2</sup> Several studies have shown that NSM is oncologically safe and permits to achieve high patient satisfaction and better aesthetic results than other traditional mastectomies.<sup>3–7</sup> NSM should be considered in breast cancer patients when a conserving approach cannot guarantee adequate local control and good cosmetic results. Common indications to NSM include extensive or multicentric disease, inability to obtain clear surgical margins with breast conserving-surgery, large tumor size with respect to the breast size, as well as cases with contraindications for radiotherapy as well as patient preference.<sup>2,5,8</sup> Absolute contraindications to NSM are inflammatory carcinoma, locally advanced tumor infiltrating the skin, clinical and radiological evidence of nipple-areola complex involvement, pathologic nipple discharge and nipple Paget's disease.<sup>2,8</sup> Obesity with high body mass index (BMI) > 30kg/m<sup>2</sup>, large breasts, previous radiotherapy, active smoking, areolar

surgery are considered relative contraindications due to the increased risk of nipple-areola necrosis, asymmetries and nipple displacement.<sup>2,7,8</sup>

So, in decision-making process about NSM in breast cancer patients with higher BMI, it is always necessary to consider a series of issues related to this procedure: longer operative times; surgical morbidity with increased risk of complications such as ischemia of the skin and/or of the nipple-areola complex; presence of sequelae with negative impact on health-related quality of life<sup>2,7,8</sup>; Christopher Webb and colleagues conclude in their study that the "Increasing BMI correlated with operative time ( $r = 0.33$ ,  $p < 0.001$ ) and was associated with slightly higher odds of major nipple-areola complex ischemic complications (OR = 1.09,  $p = 0.02$ )".<sup>1</sup>

When a NSM is performed, surgeon's knowledge and experience are necessary requirements to reduce operation times and increase the chance of success.<sup>2,3</sup> Evidence-based surgery is the integration of best research evidence, surgical expertise and patient values. However, I think that an "optimal NSM" requires both individual ability and technical skill but also other attributes as dedication, decision-making skills and the repetitive performance of standardized tasks. So, the modern breast surgeon should always follow some specific and crucial steps, as:

- Careful clinical staging of disease and accurate selection of candidates to NSM with clinical assessment, ultrasonography, mammography and magnetic resonance should be performed.

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- An adequate radiological preoperative study should be obtained in order to evaluate the extent of disease, to localize tumor and/or calcifications but also to define the more appropriate anatomic planes of dissection.
- Multidisciplinary discussion, in a dedicated “Surgery Board”, should be realized in order to choose together with plastic surgeons the better reconstruction technique.
- Specific planning of the most “performing” skin incision should be made to minimize vascular impairment to the skin and nipple-areola complex; inframammary incision in selected cases may be an optimal access to preserve the vascular viability and innervation of the nipple-areola complex and to obtain a well-hidden scar.
- Technical skill and maximum attention should be paid while performing an “anatomical” NSM in order to remove all breast tissue and not to leave macroscopic residues of mammary gland; the correct superficial plane dissection is in the subdermal fascial plane; the circummammary ligament is used as anatomical guide to the peripheral limits of mastectomy.
- A meticulous dissection with electrocautery should preserve an adequate subcutaneous thickness to maintain the vascular viability and reduce the risk of skin and nipple-areola necrosis; the manoeuvre of blunt dissection using the fingertips may be used.
- The intercostal perforators coming medially off the sternum should be identified and preserved because they can supply a significant vascular supply to the skin flaps.
- Attention to preserve the pectoralis major fasci should be paid while removing the mammary gland in order to facilitate the following reconstruction stage.
- Intraoperative radiological and pathological evaluation of the excised specimen for the definition of the lesions and the margins of resection should be obtained.
- Retroareolar tissue should be identified by upwards spin of nipple; then it should be marked with surgical thread and excised; frozen sections on the retroareolar tissue need to be performed intraoperatively to rule out evidence of tumor cells.
- Systematic circumferential palpation and visual exploration of prepectoral surgical cavity post-mastectomy should be realized

to exclude presence of further macroscopic residues of mammary gland; the skin flaps should be visualized and trimmed, if necessary, to remove any residual breast tissue.

- The breast tissue should always be weighed to determine the subsequent reconstruction volumes.
- Intraoperative skin perfusion testing of the flaps after NSM with a fluorescence imaging system (photodynamic eye [PDE]) should be performed to evaluate skin flap perfusion in real time and have immediate feedback as to the vascular integrity of flaps.

While performing NSM, it would be useful to bear in mind these suggestions and recommendations in order to improve operative times and outcomes and minimize the risk of complications.

The modern breast surgeon should always know where he is going and the repetitive performance of specific standardized tasks could increase his ability when he faces the challenges of the most complex NSM in patients with higher BMI.

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