



Conservative surgery after neoadjuvant chemotherapy in patients with operable breast cancer

Neoadjuvant chemotherapy is being used with increasing frequency in the multidisciplinary treatment of patients with operable breast cancer. Although large clinical trials have shown no differences between the same systemic therapy given pre- or post-surgery on disease-free and overall survival, neoadjuvant therapy may have several advantages. By downstaging of the tumor, chemotherapy can convert patients who are candidates for mastectomy to breast-conserving surgery candidates. Furthermore, it has potential to reduce excision volumes in patients with large cancer who are already candidates for breast conserving surgery improving cosmetic outcomes. Another surgical advantage is downstaging of the axilla so that lymph node dissection can be avoided in selected patients reducing surgical morbidity.

Neoadjuvant therapy also allows to monitor response to therapy at an early stage; potentially allowing time and flexibility to switch therapies if patients do not respond. All early stage breast cancer patients identified as likely to require adjuvant chemotherapy should be considered for neoadjuvant therapy, as they may potentially benefit from treatment before surgery. Factors favouring neoadjuvant therapy in patients with operable breast cancer include: lymph node-positive disease; high tumor volume-to-breast ratio; specific biological features of primary cancer (high grade, hormone receptor-negative, HER2-positive, triple negative cancer); younger age. Patients with HER2-positive and triple negative cancers have the highest probability of achieving pathological complete response after neoadjuvant therapy making them good candidates for consideration.

The two main goals of the surgeon when performing BCS after neoadjuvant chemotherapy are to obtain tumor-free margins and achieve a good cosmetic outcome by keeping the amount of healthy breast tissue excision as low as possible. Tumor-involved margins increase the risk of LRR and therefore require additional local therapy, such as a radiation therapy boost, re-excision, or even mastectomy.

To optimize the oncological and aesthetic results and minimize local recurrence rates, there are essential procedures to be respected as:

- Careful local and systemic staging before chemotherapy (Ultrasonography, Mammography, Magnetic Resonance and PET- TAC);
- Use of the technique of breast tattooing as practical method to delimit the initial tumor size and its margins before chemotherapy;
- Placement of clips before chemotherapy to mark the primary tumor site and metastatic lymph nodes;
- Accurate clinical restaging of the disease performed at the completion of chemotherapy;
- Adequate radiological preoperative study with localization of residual tumor and/or calcifications and/or clips especially after a good response to neoadjuvant chemotherapy;
- Use of innovative oncoplastic techniques that gives more options to have wide resections without compromising the cosmetic outcome;
- Intraoperative radiological and pathological evaluation of the specimen, for the definition of the lesion and the margins of resection;
- Accurate pathological management and assessment of the specimen using histological large sections (macrosections).

In conclusion, sufficient evidence is now available to suggest that breast conservation after neoadjuvant chemotherapy is safe and effective for selected patients. Though neoadjuvant chemotherapy may increase the complexity of breast conservative treatment, a close collaboration between a multidisciplinary team and use of oncoplastic surgical techniques permit to optimize oncological and cosmetic outcomes.

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