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Chest wall resection and reconstruction for locally recurrent breast cancer: From technical aspects to biological assessment

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ABSTRACT

Introduction: Breast cancer is the leading cause of cancer death among women in the industrialized countries. The incidence of local recurrences after mastectomy and breast-conserving therapy varies between 5% and 40% depending on risk factors and primary therapy.

Methods: From April 1999 to April 2011, 40 patients underwent chest wall resection and reconstruction for locally recurrent breast carcinoma with chest wall invasion. The main goal of surgery was local disease control to palliate clinical symptoms.

Results: Local radical resection was achieved in 26 patients **(65%)**. One, 2 and 5 year overall survival rates were 94.4%, 82.0% and 68.5%; 1, 2 and 5 year disease-free survival rates were 94.4%, 73.6% and 45.5% respectively.

Univariate analysis indicated age ($p = 0.002$) and synchronous distant metastases ($p = 0.020$) as factors having a negative impact on overall survival; multivariate analysis disclosed age ($p = 0.052$) and synchronous metastases ($p = 0.059$) as factors with a slight negative impact on overall survival. Older age was associated with improved overall survival.

Univariate analysis indicated synchronous distant metastases ($p = 0.029$) and the need of post resectional additional treatments ($p = 0.022$) as factors adversely conditioning disease-free survival or time to progression; multivariate analysis disclosed the need of post resectional additional treatments ($p = 0.036$) as the only factor adversely conditioning disease-free survival or time to progression.

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Conclusions: Chest wall resection and reconstruction for locally recurrent breast cancer is a feasible and safe procedure providing adequate local disease control and an excellent palliation of very disabling symptoms in a selected group of patients.

Introduction

Breast cancer is the leading cause of cancer death among women in the industrialized countries.[1] The incidence of local recurrences after mastectomy and breast-conserving therapy varies between 5% and 40% depending on risk factors and primary therapy.[2]

The first-line treatments in recurrent breast cancer are endocrine therapy for patients with estrogen or progesterone receptor positive cancer, and chemotherapy for patients with receptor-negative cancers.[3–5] However, local therapies such as radiotherapy or surgery may be required in selected cases for local disease control and palliation of disabling symptoms like pain, bleeding, ulceration, malodorous secretion, infection and fungating lesions.[6,7]

On the one hand, locoregional recurrence of breast cancer following breast surgery may be a systemic disease and in many patients it tends to occur at the same time as distant metastases, making the indication for surgical resection questionable.[8,9] On the other, although the primary goal of chest wall resection is to achieve local tumor control, it may lead to long-term palliation and even cure for a small subset of patients with isolated chest wall recurrence of breast cancer after multimodal treatment failure.[10]

Early detection of locoregional recurrence and small tumor size predicted a better prognosis.[11–13] Options for local treatment of locoregional recurrence include wide local excision and/or radiotherapy whether or not in combination with hyperthermia[14]; however, for small lesions, the type of local treatment did not affect the final outcome.[15]

Whether complete resection of local recurrence offers a merely palliative or possibly curative approach or a major prolongation of survival remains unsettled.[16] The aim of this study was to define the role of chest wall resection for locally recurrent breast cancer as a salvage treatment for a selected group of symptomatic patients.

Methods

The present study was conducted in accordance with the Declaration of Helsinki.[17] Written informed consent was obtained from all subjects before any procedure was done. The investigators explained all the planned procedures verbally to all subjects who received and signed a subject information sheet to acquaint themselves with details of the planned therapeutic schedule. All patients authorized the investigators to use their data anonymously only for scientific purposes according to Italian legislation (law no. 675/1996).

Data were collected prospectively and entered into our institutional general thoracic database at the point of care. The database was reviewed retrospectively.

From April 1999 to April 2011, 40 patients underwent chest wall resection and reconstruction for locally recurrent breast carcinoma with chest wall invasion proven by routine preoperative chest computed tomography (CT) or by chest wall magnetic resonance imaging (MRI) in selected cases. The main goal of surgical therapy was local disease control to palliate clinical symptoms like pain, cutaneous ulceration and discomfort related to chest wall deformity. For this reason a distant metastasis was not a contraindication. Selection criteria for surgery were multimodal treatment failure and life expectancy of more than 6 months.

The surgical approach involved soft tissue resection with broad margins and chest wall resection with total or partial sternectomy and resection of one or more ribs. In case of major tissue defect following resective surgery reconstruction was performed using different types of prostheses covered by a vascularized pedicle muscle flap.

Technical aspects of demolition and reconstructive procedures were reviewed (sternectomy, ribs resection, soft tissue resection, endothoracic organ resection, type of prosthesis, type of flap and technical complications) together with oncologic history including previous type and date of breast operation, histology and biology of breast and thoracic surgical specimens (Ki67%, Her2 neu expression, estrogen and progesterone receptor expression), and the interval between breast and thoracic surgery.

Patients were defined as triple negative if estrogen, progesterone and Her2 neu expression were negative; otherwise, they were defined as non-triple negative.[10]

Recurrence was defined as the return of cancer after treatment and after a period of time during which the cancer could not be detected. Local recurrence was defined as the reappearance of disease in locoregional lymph nodes or in the chest wall adjacent to the site of thoracic excision. Distant recurrence was defined as distant sites of visceral disease, including malignant pleural effusions or implants.

Progression was defined as cancer growth without a period of time during which the cancer could not be detected. Distant progression was defined as cancer spreading to distant sites; locoregional progression was defined as cancer worsening close to the surgical field.

A complete resection (R0) was defined as pathologic demonstration of negative tissue margins and an assessment by the operating surgeon that all detectable disease had been removed. Microscopically incomplete resection (R1) was defined as complete macroscopic resection with positive margins found on final pathologic review. Macroscopically