# Management of Breast Cancer Invading Chest Wall

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**KEYWORDS**

• Breast cancer • Chest wall • Resection • Reconstruction • Surgical management

**KEY POINTS**

- Surgical treatment of locally advanced or recurrent breast cancer involving the chest wall continues to play a role in the therapeutic armamentarium as part of the multidisciplinary treatment regimen.
- Significant progress has been made in chest wall reconstructive techniques.
- Advancements in understanding cancer biology and behavior, and the development of novel therapeutic agents expanded therapeutic options.
- Patient selection and superb knowledge of the most recent and effective treatment regimens are necessary to maximize the survival benefit and quality of life for patients affected with breast cancer involving the chest wall.

## INTRODUCTION

Breast cancer affects 1 in 8 women (~12% lifetime risk), and it is the second leading cause of cancer-related death (21.5 deaths per 100,000) among women, following lung cancer.[1] In 2016, an estimated 246,660 new cases of invasive breast cancer are expected to be diagnosed in the United States, not including 61,000 new carcinoma in situ diagnoses.[1] Fortunately, the death rates from breast cancer have been decreasing since early 1990s mainly due to increased awareness, earlier detection, and treatment advancements. Depending on the stage of the disease at the time of diagnosis, current therapeutic options may include surgical resection, chemotherapy, radiation therapy, hormonal therapy, targeted therapy, or immunotherapy.

Through the continuously increasing understanding of tumor biology, surgical resection of breast cancer has evolved over the last 100 years from Halsted's radical mastectomy to much less extensive and more personalized surgical resections. Nowadays, decisions regarding the extent of surgical resection for breast cancer take into account tumor biology, disease extent, patient's physiognomy, as well as patient's preferences. The spectrum of surgical procedures may range from partial mastectomy with sentinel lymph node biopsy and adjuvant radiation to double mastectomy sometimes performed with the intent to prevent breast cancer. The advancements in chemotherapy and hormonal therapy have made major radical resections that include pectoralis major muscle or chest wall less common. In addition, breast reconstructive techniques have also significantly improved esthetics and function for many women who undergo surgical resection of breast cancer.

The treatment of breast cancer requires multidisciplinary expertise. Thoracic surgeons are occasionally summoned to assist with the management of breast cancer, mainly in situations when breast cancer invades into the chest wall or if the disease is detected in the internal mammary

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Thorac Surg Clin ■ (2017) ■–■
http://dx.doi.org/10.1016/j.thorsurg.2017.01.009

lymphatic chain (Figs. 1 and 2). Both of these scenarios may occur either in the setting of the primarily diagnosed disease or much more commonly in the setting of recurrent disease. Considering the numerous therapeutic options available, close communication among experts from medical and radiation oncology, surgical oncology, and thoracic and plastic surgery is of paramount importance to design the most effective treatment plan that achieves locoregional disease control and preserves the maximal physiologic function and quality of life for patients. Timing and sequence of each therapy are also very important to achieve the best oncologic and functional benefit.

## SURGICAL PRINCIPLES FOR THE MANAGEMENT OF BREAST CANCER INVOLVING THE CHEST WALL

The main goal for a thoracic surgeon in the management of the breast cancer invading the chest wall is to provide the best chance for complete (R0) surgical resection to achieve locoregional disease control. Today, situations of large fungating breast cancers eroding through the skin or into the chest wall are rarely faced; therefore, purely palliative resections just to avoid persistent local infection have become less common.

The first therapeutic step in the management of primary breast cancer invading chest wall is usually chemotherapy, often given over a period of months. Chemotherapy for breast cancer has become very effective and has potential to achieve complete pathologic response in up to 60% of patients depending on the tumor characteristics (triple-negative or human growth factor receptor 2-positive breast cancer) and chemotherapeutic regimen used.[2] The effectiveness of systemic therapy in reducing the tumor size or possibly achieving complete response, may create a dilemma for thoracic surgeons about how aggressively to proceed during surgical resection after chemotherapy for previously documented chest wall invasion with breast cancer. In fact, in very highly selected patients who appear to be exceptional responders to chemotherapy and appear to have achieved complete response radiographically, based on negative findings on PET combined with computed tomography (CT) imaging, or based on MRI following chemotherapy, the question of selective elimination of breast cancer surgery arises.[2] Therefore, indications of whether to submit a patient to a potentially morbid chest wall resection should be personalized. The author has taken a selective approach in making this decision. If a patient with breast cancer and chest wall involvement appears to have complete pathologic response to chemotherapy is brought to the operating theatre for the resection of breast tissue, the area of previous tumor site, and pectoralis muscle, biopsies can be sent for frozen section from the area of chest wall involvement. Persistently positive biopsies in the chest wall indicate further resection to achieve complete tumor control. However, if all intraoperative biopsies from the chest wall are negative, the author has elected not to proceed with formal chest wall resection of the previous tumor site in selected cases, if both the imaging and the intraoperative biopsies demonstrated no evidence of viable tumor. This approach, however, requires pathology expertise in differentiating chemotherapy treatment effect and residual tumor on frozen sections. The

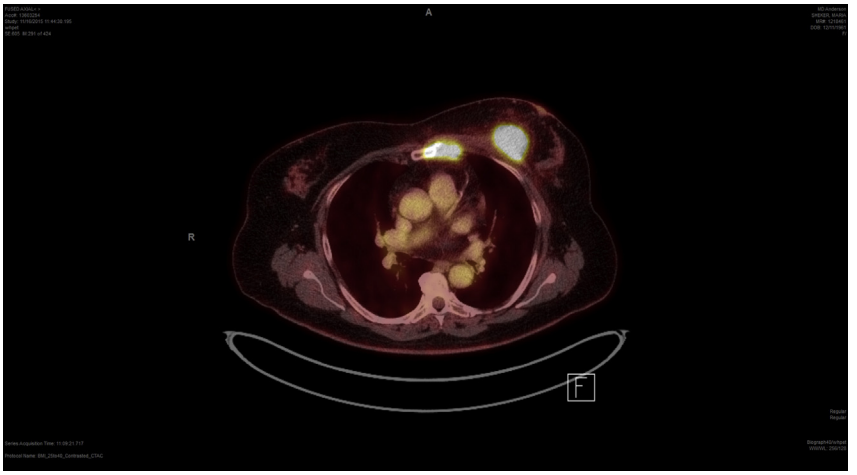


**Fig. 1.** Breast cancer with spread to internal mammary chain and chest wall.