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# Forequarter amputation for recurrent breast cancer

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ABSTRACT

*INTRODUCTION:* Localized excision combined with radiation and chemotherapy represents the current standard of care for recurrent breast cancer. However, in certain conditions a forequarter amputation may be employed for these patients.

*PRESENTATION OF CASE:* We present a patient with recurrent breast cancer who had a complicated treatment history including multiple courses of chemotherapy, radiation, and local surgical excision. With diminishing treatment options, she opted for a forequarter amputation in an attempt to limit the spread of cancer.

*DISCUSSION:* In our patient the forequarter amputation was utilized as a last resort to slow disease progression after she had failed multiple rounds of chemotherapy and received maximal radiation. Unfortunately, while she had symptomatic relief in the short-term, she had cutaneous recurrence of metastatic adenocarcinoma within 2 months of the procedure. In comparing this case with other reported forequarter amputations, patients with non-metastatic disease showed a mean survival of approximately two years. Furthermore, among patients who had significant pain prior to surgery, all patients reported pain relief, indicating a significant palliative benefit. This seems to indicate that our patient's unfortunate outcome was anomalous compared to that of most patients undergoing forequarter amputation for recurrent breast cancer.

*CONCLUSION:* Forequarter amputation can be judiciously used for patients with recurrent or metastatic breast cancer. Patients with recurrent disease without evidence of distant metastases may be considered for curative amputation, while others may receive palliative benefit; disappointingly our patient achieved neither of these outcomes. In the long term, these patients may still have significant psychological problems.



## 1. Introduction

Historically, forequarter amputations have been used for management of bone and soft-tissue sarcomas of the shoulder girdle, although more recently it has been employed in the treatment and palliation of recurrent breast cancer. Axillary tumor recurrence can be very problematic for patients, causing significant pain, lymphedema, limb dysfunction, and/or skin ulceration. In cases of isolated recurrence, management using localized surgery, chemotherapy, and radiation is the preferred approach. However, for patients who have more significant invasion without the possibility of local excision, a radical approach may be necessary for removal of the tumor in those patients desiring aggressive oncologic treatment. In these cases, the forequarter amputation offers the possibility of stopping the spread of the tumor while also palliating the pain and other morbidities often associated with invasion. We report the case of a forequarter amputation attempting to palliate a patient for axillary recurrence of breast cancer and provide a review of the literature on this controversial subject.

## 2. Presentation of case

A 49-year-old woman presented to our institution with a history of recurrent breast cancer. On her initial presentation two years earlier, she detected a mass in her right breast and presented to her primary care physician for further work-up. Prior surgical history included a gastric bypass but no breast-related procedures. The family history was significant for bilateral breast cancer in her mother. The patient was on no medications and was otherwise healthy. The physical examination detected a mobile, palpable, firm

*Abbreviations:* ALND, axillary lymph node dissection; BCT, breast conserving therapy; CA, cancer antigen; ER, estrogen receptor; MRA, magnetic resonance angiography; OR, operating room; PET/CT, positron emission tomography/computed tomography; PR, progesterone receptor; RT, radiotherapy; SLN, sentinel lymph nodes.

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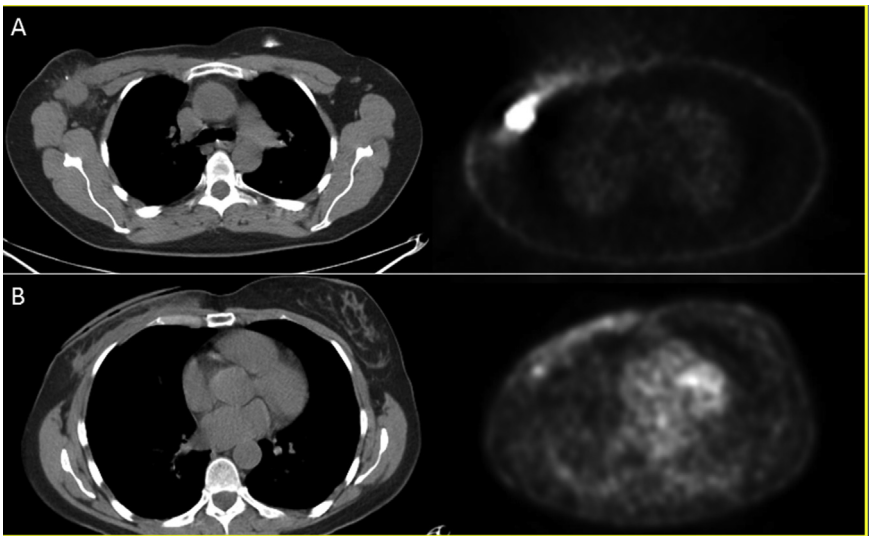


**Fig. 1.** (A) Horizontal sections on PET/CT indicating axillary recurrence of the cancer prior to surgery, and (B) post-surgical scan indicating removal of the affected lymph nodes and subsequent reduction in PET/CT signal.

mass in the central right breast. No worrisome lymphadenopathy was appreciated. Mammography detected a probable right-sided breast cancer.

An ultrasound-guided fine needle aspiration identified an invasive ductal carcinoma, and the patient was advised to have surgery. The patient opted for a right simple mastectomy to remove the 2.5 cm mass; margins were free. Two axillary sentinel lymph nodes (SLN) were negative. The mass was a Nottingham grade III invasive ductal carcinoma that was estrogen receptor (ER), progesterone receptor (PR), and HER-2/neu negative (triple negative). The nipple, skin, and chest wall were free of involvement. She was subsequently treated with dose-dense adjuvant chemotherapy using Adriamycin and cyclophosphamide for four cycles followed by four cycles of Taxol given every two weeks followed by external beam radiation to the chest wall and lower right axilla (50 Gy in 25 fractions).

Despite a negative BRCA genotype, the patient sought aggressive management of her oncologic risks and underwent bilateral oophorectomy for known polycystic ovaries and a rising cancer antigen (CA) 125 level. She was fit and seemingly well for one year.

Thirteen months after the simple mastectomy and SNL removal, she noticed right axillary lymphadenopathy which was confirmed by positron emission tomography/computerized tomography (PET/CT) as shown in Fig. 1A. There was no evidence of systemic metastatic disease. A fine-needle aspiration indicated this was metastatic poorly differentiated adenocarcinoma, and subsequent axillary dissection found 2 of 10 lymph nodes involved with tumor (Fig. 1B indicates PET/CT following axillary dissection). Postoperatively the patient received an additional 50 Gy of radiation to the axilla. She started adjuvant chemotherapy with gemcitabine and carboplatin, completing five cycles over the next five months.

A month after conclusion of her chemotherapy a PET scan indicated some nonspecific uptake in the right axilla, but no treatment was recommended at that time. Six months later, there was a palpable, firm node in the right axilla. An ultrasound-guided biopsy revealed metastatic adenocarcinoma. At this time, she was referred to our institution.

With concerns radiation was no longer an option, the patient and her oncologists desired lymph node removal in hopes of analysis to devise a better chemotherapy regimen. With a full understanding that more surgery would unlikely be curative, the patient and surgeon agreed on a third axillary operation; the procedure was difficult with dense, irradiated scar tissue throughout the axilla (Fig. 2 shows the intraoperative ultrasound). The node and surrounding tissue was removed en bloc, but resection of the axillary vein and pectoralis muscle was avoided. Histologic analysis revealed poorly differentiated adenocarcinoma involving the lymph node consistent with a primary breast source. Magnetic resonance angiography (MRA) performed three months later showed an ill-defined 4.5 cm soft tissue mass in the right axilla consistent with recurrent tumor or adenopathy and possible involvement of the axillary vein and chest wall (Fig. 3). At this time there was no evidence of distant metastatic disease. In consulting with her medical team, the patient was presented the options of continuing with observation, further chemotherapy, or a forequarter amputation. In order to attempt a more aggressive solution to the issue, the patient opted for a

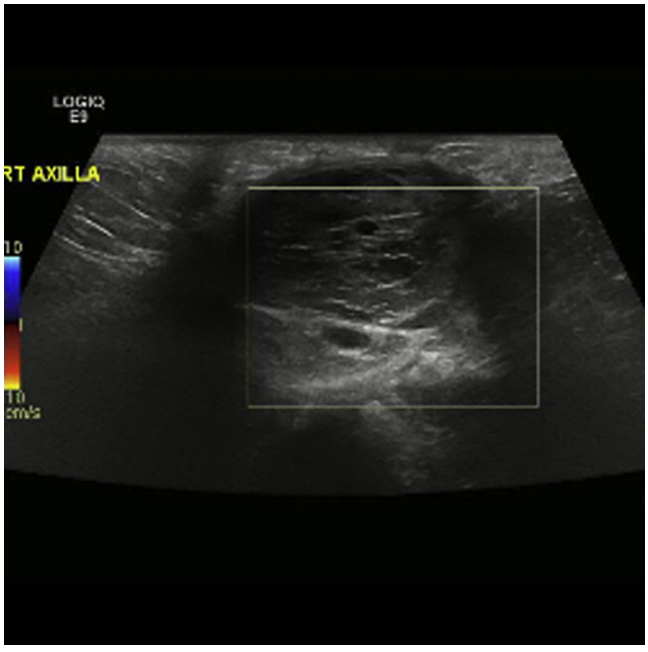


**Fig. 2.** Intraoperative ultrasound of the axilla indicating dense, woody tissue with diffuse scarring from radiation therapy.