

## Neck Dissection or Radiotherapy in Supraclavicular Node Positive Breast Carcinoma Patients

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**Abstract:** Neck dissection or radiotherapy is a controversial treatment option for breast cancer patients with supraclavicular lymph node metastasis (ISLM) without distant metastases or neoadjuvant chemotherapy. Radiotherapy, a non-invasive treatment, has been shown to produce equivalent loco regional control and survival rates when compared to supraclavicular neck dissection. However, choosing one over the other or selecting a multimodality treatment option still remains a matter of debate. This short review looks to address this dilemma.

**Keywords:** Supraclavicular nodal metastasis, radiotherapy, selective neck dissection, surgery, multimodality treatment.

### 1. INTRODUCTION

Patients with breast cancer who present with isolated supraclavicular lymph node metastasis (ISLM) without evidence of distant metastases and who have not received neoadjuvant chemotherapy are typically treated with a combination of systemic and localized therapies. Systemic treatments may include chemotherapy, hormonal therapy, and targeted therapies aimed at controlling or eradicating cancer cells throughout the body. Localized therapies often involve radiation therapy to the affected lymph nodes, with the goal of controlling regional disease and preventing further spread.

In this specific patient population, the optimal approach to managing the supraclavicular lymph node involvement is still a matter of clinical investigation. Radiation therapy is commonly employed due to its ability to target and treat regional lymph nodes effectively. However, surgical intervention, such as supraclavicular neck dissection, which involves the removal of the affected lymph nodes, is another therapeutic option. The comparative effectiveness of radiation therapy versus supraclavicular neck dissection in achieving disease control, improving survival outcomes, and minimizing treatment-related morbidity is under continuous scrutiny and debate within the oncological

community. Ongoing research aims to delineate the most effective and least toxic treatment strategy for these patients.

### 2. MATERIALS AND METHODS

As a part of a detailed systematic review, a preliminary literature search was conducted to identify studies comparing the outcomes of surgery versus radiotherapy in patients with breast cancer presenting with isolated supraclavicular lymph node metastasis (ISLM), the results of which were planned to be included as a part of this short review. The databases searched included PubMed, MEDLINE, EMBASE, and Google Scholar. The search was performed using the following keywords and Medical Subject Headings (MeSH) terms: "breast cancer," "supraclavicular lymph node metastasis," "ISLM," "radiotherapy," "surgery," "supraclavicular neck dissection," and "comparative outcomes." Studies that reported survival outcomes of either one/both modalities in peer-reviewed journals with full texts available were included. Case reports and studies without a mention of the survival outcomes were excluded. Discrepancies in data extraction were resolved through discussion and consensus. The principles of ethical research conduct were diligently adhered to, including the accurate reporting of findings and crediting the original studies. The results of the

preliminary review were then documented and reported.

### 3. CURRENT LANDSCAPE OF RADIOTHERAPY OR NECK DISSECTION FOR SUPRA CLAVICULAR NODAL METASTASIS

Patients with breast cancer who come with supraclavicular lymph node metastasis (ISLM) but no distant metastases and have not undergone neoadjuvant chemotherapy often get a mix of systemic and local treatments. The role of radiation vs supraclavicular neck dissection in this scenario is still being investigated and debated.

Since radiotherapy is non-invasive and has a wide range of applications, it has long been seen as an essential component in the management of ISLM. Adjuvant radiation treatment has been shown in studies to produce adequate loco regional control and survival rates. Adjuvant radiation did not substantially increase loco regional recurrence-free survival, distant metastasis-free survival, disease-free survival (DFS), or overall survival (OS) when compared to patients who did not receive radiotherapy in a retrospective review of Chinese patients [1]. The 3- and 5-year OS and DFS rates reported in this study were 79.5% and 73.9%, respectively, and 67.5% and 54.8%, respectively. Furthermore, surgery or radiotherapy when used as a sole modality of treatment had similar outcomes in terms of DFS and OS [2].

On the other hand, the function of dissecting the supraclavicular lymph nodes is still controversial. Adding surgical dissection to radiation therapy may not substantially increase survival rates, according to some research. No statistically significant difference was observed in the 5-year DFS and OS rates between the groups in a research comparing radiotherapy alone with surgery + radiation, even though the surgery group's local control was superior in a study by Ting-Shuo et al [3]. In a similar vein, Wu et al. found that while surgery, chemotherapy, hormone therapy, and radiation therapy were all effective when combined, supraclavicular lymph node removal did not by itself enhance survival rates in node positive cases [4]. Particularly, Chen et al. showed that compared to those who were not treated with supraclavicular node dissection, individuals with metachronous ISLM who underwent selective neck dissection had much improved 5-year OS [5]. The 5-year distant metastasis-free survival

(DMFS), post-recurrence survival, and overall survival (OS) rates in the selective neck dissection (SND) group were 31.1%, 40.3%, and 68.9%, respectively, whereas those of the no-SND group were 9.7%, 32.9%, and 57.7%, respectively ( $p = 0.001$ ). According to Ma et al, supraclavicular lymph node dissection with radiation produced better DFS and OS in patients with non-luminal A malignancies and more positive axillary lymph nodes than radiotherapy alone [6]. The combined group had a significantly better PFS (16.5 vs 10 months,  $P < 0.001$ ) and OS (40 vs 28 months,  $P = 0.001$ ) than the systemic group.

It's essential to note that the effectiveness of these therapies is also highly dependent on the molecular subtypes of breast cancer. In terms of locoregional control and long-term survival, patients with hormone receptor (HR)-negative or HER2-positive subtypes may benefit from neck dissection, as stated by Jung et al [7]. On the other hand, individuals with HER2-negative and HR-positive subtypes might not benefit from surgery in the same ways due to the aggressive biology of the disease [8].

### 4. CONCLUSION

In conclusion, surgery and radiotherapy continue to play a crucial role in treating isolated synchronous metastases in breast cancer. Including supraclavicular neck dissection could provide further advantages, especially for patients with aggressive tumor biology or specific molecular subtypes. Customizing treatment based on individual patient and tumor characteristics may be attempted for enhancing outcomes in this context, however multimodality treatment remains the approach in terms of outcomes in today's practice.

This preliminary review is to be followed by a detailed systematic review of existing literature in the future and will aid in solidifying the role of surgery and radiotherapy in the management of supraclavicular node positive breast cancers.

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**Citation:** *Vrushab Rao et al. Common Neck Dissection or Radiotherapy in Supraclavicular Node Positive Breast Carcinoma Patients. ARC Journal of Surgery. 2024; 10(1):32-34. DOI: <https://doi.org/10.20431/2455-572X.1001004>.*

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