World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(CASE REPORT)

Check for updates

Radiotherapy for a recurrent Subclavicular ectopic breast carcinoma: Case report and detailed literature review

H. Yamine *, S. Khalfi, K. Soussy, W. Hassani, F. Farhane, Z. Alami and T. Bouhafa

Department of Radiation Oncology, Hassan II University Hospital, Fez, Morocco.

World Journal of Advanced Research and Reviews, 2026, 29(03), 596-602

Publication history: Received on 29 January 2026; revised on 06 March 2026; accepted on 09 March 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.29.3.0567

Abstract

Ectopic breast carcinoma is an uncommon malignancy arising from accessory breast tissue located along the embryologic milk line. Subclavicular involvement is extremely rare and poses diagnostic and therapeutic challenges. We report the case of a 42-year-old woman presenting with a locally recurrent carcinoma arising from ectopic breast tissue located in the left subclavicular region, occurring six years after initial excision without adjuvant therapy.

The patient underwent multidisciplinary management including radical surgery with modified radical mastectomy and wide excision of the ectopic lesion. Pathology confirmed invasive ductal carcinoma, Nottingham grade III, luminal B phenotype with lymphovascular invasion and close margins. Adjuvant treatment consisted of sequential anthracycline-taxane chemotherapy, endocrine therapy with tamoxifen, and hypofractionated intensity-modulated radiotherapy (IMRT) to the chest wall and ectopic tumor bed with boost.

Dosimetric analysis confirmed adequate target coverage and satisfactory sparing of organs at risk. Acute toxicity was limited to grade 1 radiodermatitis. This case highlights the importance of recognizing ectopic breast carcinoma and supports a multidisciplinary treatment approach based on conventional breast cancer management principles when dedicated guidelines are lacking.

Keywords: Ectopic breast tissue; Accessory breast; Subclavicular; Recurrent breast carcinoma; Postmastectomy radiotherapy; IMRT

1. Introduction

Ectopic (accessory) breast tissue refers to the abnormal persistence of mammary tissue along the embryologic milk line. Although uncommon in the general population, it has been reported in approximately 0.2–6% of individuals depending on the series. Ectopic breast tissue may develop the same benign, inflammatory, and malignant conditions as orthotopic breast tissue; however, malignant transformation is exceptional and accounts for <1% of all breast cancers. The axilla is the most frequent location, whereas subclavicular presentations are exceedingly rare and sparsely described in the international literature. Owing to rarity and atypical clinical presentation, diagnosis is often delayed and management is not specifically codified. Here, we report the case of a 42-year-old woman with a locally recurrent carcinoma arising from left subclavicular ectopic breast tissue, occurring six years after an initial isolated excision without adjuvant treatment. We describe the clinical, pathological, and therapeutic features of this case, including adjuvant systemic therapy and IMRT-based hypofractionated radiotherapy, together with a detailed literature review.

* Corresponding author: H. Yamine

2. Embryology

The mammary gland develops from the primitive milk line (mammary ridge), which appears during the fifth week of embryogenesis as a thickening of the ectoderm. This line extends from the axilla to the inguinal region. During normal development, most of the milk line regresses, leaving only two thoracic mammary buds that will differentiate into the definitive breasts. Incomplete regression can result in the persistence of ectopic breast tissue along the milk line. Ectopic breast tissue may present as polymastia (a complete supernumerary breast), polythelia (a supernumerary nipple), or isolated glandular tissue without nipple–areola complex. At birth, the mammary gland is rudimentary and subsequently develops under hormonal influence, particularly during puberty. Importantly, ectopic breast tissue retains biological properties similar to orthotopic breast tissue and may therefore undergo the same pathological processes.

3. Pathophysiology and Diagnosis

Ectopic breast tissue may remain asymptomatic for years and be discovered incidentally. In some patients, it exhibits physiologic hormonal changes such as enlargement during pregnancy, cyclic mastalgia, or premenstrual swelling. Diagnosing carcinoma arising in ectopic breast tissue can be challenging due to atypical location and the absence of classic breast findings. Such lesions may initially be mistaken for benign conditions including lipoma, epidermoid cyst, hidradenitis suppurativa, axillary lymphadenopathy, or soft-tissue tumors. Clinical clues suggesting accessory mammary tissue include a lesion located along the milk line, relative mobility, and hormonal variation in size. Breast imaging is essential to exclude an occult orthotopic primary. Mammography and breast MRI are particularly useful for ruling out synchronous breast lesions and for assessing locoregional extension. Definitive diagnosis relies on histopathology.

4. Case Presentation

A 42-year-old woman presented with a firm left subclavicular mass. She had undergone excision of a left subclavicular nodule six years earlier. Pathology from the first surgery demonstrated invasive ductal carcinoma (IDC) graded SBR/Nottingham grade II (Elston–Ellis modification of Scarff–Bloom–Richardson). Immunohistochemistry (IHC) showed estrogen receptor (ER) 66%, progesterone receptor (PR) 8%, HER2 score 1+, and Ki-67 23%, consistent with a luminal B, HER2-negative phenotype. The patient did not receive adjuvant therapy and was subsequently lost to follow-up.

Six years later, she noted a progressively enlarging left subclavicular swelling. Clinical examination found a firm mass measuring approximately 6 cm above the left clavicle. No palpable axillary lymphadenopathy was present. Bilateral mammography and breast MRI demonstrated no suspicious lesions within the orthotopic breasts and no axillary adenopathy, supporting a primary ectopic origin.

5. Therapeutic Management

The management plan was discussed at a multidisciplinary tumor board (surgery, medical oncology, radiation oncology, and pathology). Given the setting of local recurrence arising from ectopic subclavicular breast tissue, the large tumor size, and adverse pathological features, a multimodal strategy including surgery, adjuvant chemotherapy, radiotherapy, and endocrine therapy was selected.

5.1. Surgery

The first step consisted of radical surgery. The patient underwent a left modified radical mastectomy (Patey) combined with wide excision of the ectopic subclavicular tumor. The aim was to achieve optimal locoregional control by removing any residual mammary tissue potentially responsible for recurrence. Final pathology confirmed IDC, NOS, Nottingham grade III, with lymphovascular invasion and close/inadequate inferior surgical margins. An associated ductal carcinoma in situ component was estimated at ~15%. IHC demonstrated ER and PR positivity, HER2 score 1+ (HER2-negative), and Ki-67 45%, consistent with luminal B, HER2-negative disease with high proliferative index. These unfavorable prognostic factors supported adjuvant therapy.

5.2. Adjuvant Chemotherapy

Adjuvant chemotherapy was initiated after postoperative healing. A sequential regimen was administered consisting of:

- 4 cycles of AC60 (doxorubicin + cyclophosphamide).
- Followed by weekly paclitaxel 80 mg/m^2 for 12 weeks (without interruption).

This regimen is widely used for high-risk early breast cancer and is associated with reduced recurrence risk and improved survival. Treatment was overall well tolerated, with no major complications reported.

5.3. Endocrine Therapy

Given hormone receptor positivity, endocrine therapy was initiated. Tamoxifen was started concomitantly with adjuvant chemotherapy, a strategy that may be used in premenopausal patients with luminal breast cancer. Planned duration is 10 years, consistent with evidence supporting extended endocrine therapy in hormone-receptor-positive disease [21].

6. Adjuvant Radiotherapy

After completion of chemotherapy, adjuvant radiotherapy was delivered due to local recurrence, large tumor size, lymphovascular invasion, and close margins. In the absence of dedicated guidelines for ectopic breast carcinoma, the irradiation strategy followed principles of postmastectomy radiotherapy for breast cancer [16].

6.1. Simulation and Target Volume Delineation

The patient was positioned supine with both arms abducted above the head using a dedicated immobilization device. A CT simulation with thin slices was performed for 3D planning. Target volumes were delineated according to international contouring recommendations (ESTRO/ICRU).

The clinical target volume (CTV) encompassed the left chest wall and the tumor bed corresponding to the subclavicular ectopic tissue location. A planning target volume (PTV) was generated by adding an isotropic margin to account for setup uncertainties and respiratory motion.

6.2. Technique

Given left-sided treatment and an extended target volume, intensity-modulated radiotherapy (IMRT) was selected to optimize dose conformity and limit exposure to organs at risk (OARs). Treatment was delivered on a Varian linear accelerator using IMRT. OARs included the heart, ipsilateral and contralateral lungs, and spinal cord. Heart sparing was a key objective.

6.3. Dose Prescription

A hypofractionated schedule was prescribed:

- 40 Gy in 15 fractions to the left chest wall and ectopic tumor bed.
- An additional boost of 10 Gy in 5 fractions to the tumor bed to improve locoregional control in this recurrent setting.
- This regimen aligns with hypofractionation evidence in breast radiotherapy and contemporary practice [17].

6.4. Dosimetric Evaluation and Tolerance

Dose–volume histogram (DVH) analysis confirmed adequate PTV coverage and compliance with recommended OAR constraints, including a low mean heart dose and reduced irradiated lung volume. Acute toxicity was limited to grade 1 radiodermatitis. No significant cardiac or pulmonary adverse events were observed during treatment.

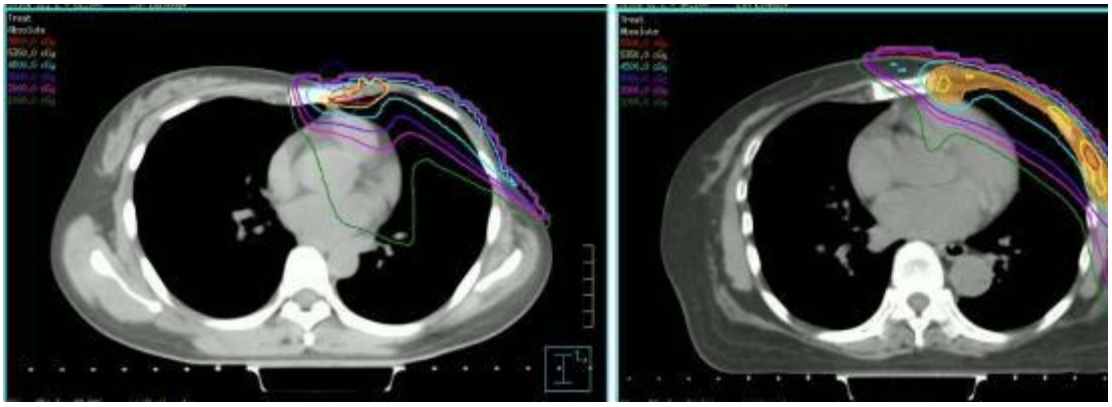

Figure 1 IMRT treatment plan showing dose distribution for irradiation of the left chest wall and ectopic

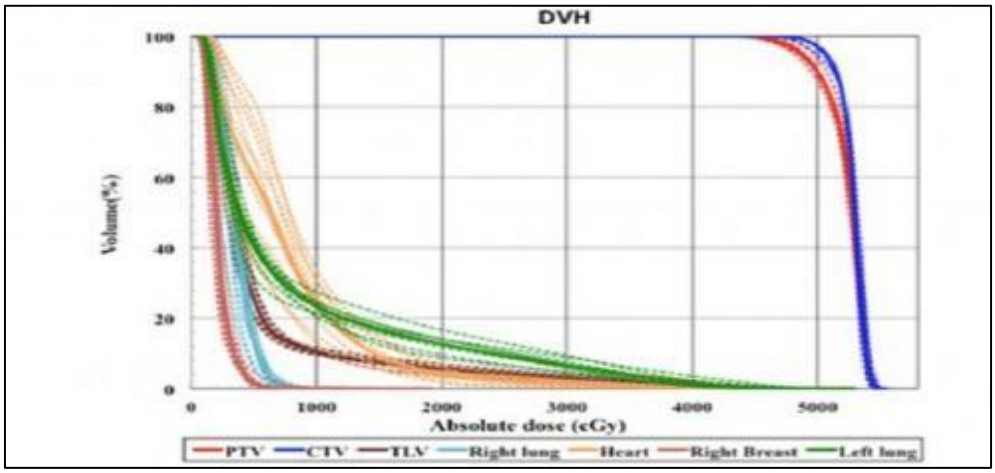

Figure 2 Dose–volume histogram (DVH) demonstrating target coverage and organ-at-risk dose constraints

7. Discussion and Literature Review

Breast carcinoma arising in ectopic breast tissue is a rare clinical entity, estimated to account for approximately 0.2–0.6% of all breast cancers [1]. Because of low incidence, published evidence primarily consists of case reports and small retrospective series, which limits the development of specific therapeutic guidelines and often necessitates extrapolation from orthotopic breast cancer management [2].

Ectopic breast tissue originates from incomplete involution of the embryologic milk line that appears around the fifth week of gestation and extends from the axilla to the groin [3]. The reported prevalence of ectopic breast tissue ranges from 0.2% to 6% [4], more frequently in women, and may manifest as polymastia or polythelia [5]. The axilla is the predominant site (~60–70%) [6]. Subclavicular ectopic breast carcinoma, as in the present case, remains exceptionally rare and may contribute to diagnostic delay, as lesions are often misdiagnosed as lipomas, cysts, hidradenitis, or lymph nodes [9].

Histopathological and biological features closely resemble those of orthotopic breast cancers [11]. Invasive ductal carcinoma is the most frequently reported histology [8]. Our case demonstrated recurrent IDC NOS with high grade, lymphovascular invasion, close margins, and a high Ki-67 index, consistent with a higher-risk luminal B phenotype. Notably, the biological progression from grade II/Ki-67 23% at initial excision to grade III/Ki-67 45% at recurrence suggests clonal evolution towards more aggressive behavior, a phenomenon described in breast cancer biology [13]. Imaging is crucial both for characterizing the ectopic lesion and for excluding an orthotopic primary. Mammography and MRI are particularly helpful to rule out synchronous breast tumors and assess nodal involvement [10]. In our patient, bilateral mammography and breast MRI were negative for orthotopic breast lesions and axillary adenopathy, supporting an ectopic primary origin.

Because no dedicated guidelines exist, most authors recommend treating ectopic breast carcinoma according to conventional breast cancer principles [14]. Surgery is the cornerstone and generally consists of wide local excision with appropriate nodal evaluation when indicated [15]. In the present recurrent setting with adverse features and the need for optimal locoregional control, a Patey modified radical mastectomy combined with wide excision of ectopic tissue was chosen.

Systemic therapy is guided by standard risk factors (tumor size, grade, proliferation, lymphovascular invasion, nodal status) and tumor biology. Anthracycline- and taxane-based regimens are commonly used for high-risk early breast cancer, and endocrine therapy is essential for hormone-receptor-positive disease. Tamoxifen remains a key option in premenopausal patients and has demonstrated significant reductions in recurrence and breast cancer mortality in meta-analyses [21].

Adjuvant radiotherapy is critical for reducing locoregional recurrence in patients with high-risk features, including large tumors, lymphovascular invasion, and close/positive margins [16]. Hypofractionated schedules are widely validated and can be safely applied in appropriate settings [17]. Modern techniques such as IMRT improve dose conformity and reduce cardiac and pulmonary exposure [18]. Given the established relationship between mean heart dose and subsequent ischemic heart disease risk after left-sided breast irradiation [19], heart-sparing planning is particularly important. In our case, DVH analysis confirmed acceptable OAR doses, supporting the benefit of IMRT in optimizing the therapeutic ratio [20].

Overall, this case underscores the importance of recognizing ectopic breast carcinoma as a diagnostic possibility for milk-line masses and highlights the value of a multidisciplinary, breast-cancer-based multimodal approach (surgery, systemic therapy, and modern radiotherapy) to achieve optimal disease control.

Table 1 Reported cases of ectopic breast carcinoma in the literature and comparison with the present case

Reference	Year	Age	Location	Histology / Biology	Tumor size	Nodal status	Surgical treatment	Adjuvant therapy	Outcome
Present case	2026	42	Left subclavicular ectopic breast	IDC NOS, Nottingham grade III; ER/PR+; HER2 1+ (negative); Ki-67 45%	6 cm	N0	Wide excision of ectopic mass + Patey modified radical mastectomy	AC60 ×4 → weekly paclitaxel ×12; IMRT 40 Gy/15 + boost 10 Gy; tamoxifen (planned 10 years)	Follow-up ongoing
Marshall et al.	1994	55	Axilla	IDC	2 cm	N+	Wide excision	RT + systemic therapy	NR
Routiot et al.	1998	60	Axilla	IDC	3 cm	N+	Excision + ALND	RT	NR
Evans et al.	1995	47	Axilla	IDC	2.5 cm	N0	Wide excision	None	Disease free
Velanovich	1995	50	Axilla	IDC	NR	NR	Excision	RT	NR
Cogswell	1961	62	Axilla	Adenocarcinoma	NR	N+	Excision + ALND	RT	NR
Yang et al.	2001	58	Axilla	IDC	1.8 cm	N0	Excision	None	NR
Shin et al.	2001	45	Axilla	Secretory carcinoma	1.5 cm	N0	Wide excision	None	Disease free
da Silva et al.	2008	86	Chest wall	Ductal carcinoma	NR	28/28+	Excision + ALND	NR	Aggressive course
Nihon-Yanagi et al.	2011	63	Axilla	Scirrhous IDC	0.6 cm	NR	Excision	NR	NR

8. Conclusion

Subclavicular ectopic breast carcinoma is exceedingly rare and may be associated with delayed diagnosis due to its atypical presentation. This case illustrates that, in the absence of dedicated guidelines, management should follow standard breast cancer principles, with careful exclusion of an orthotopic primary and a multidisciplinary treatment strategy tailored to pathological risk factors and tumor biology.

In a recurrent setting with adverse prognostic features, multimodal therapy—including radical surgery, anthracycline-taxane chemotherapy, endocrine therapy, and IMRT-based hypofractionated postmastectomy radiotherapy with tumor-bed boost—can provide effective locoregional control while maintaining acceptable toxicity. Reporting well-documented cases and pooled literature analyses remains essential to refine diagnostic pathways and optimize therapeutic strategies for this uncommon entity.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that they have no conflict of interest.

Statement of ethical approval

Ethical approval was not required for this case report according to institutional policy.

Statement of informed consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

References

[1] Marshall MB, Moynihan JJ, Frost A, Evans SR. Ectopic breast cancer: case report and literature review. Surgery. 1994;115(1):122–124.

[2] Routiot T, Marchal C, Verhaeghe JL, Depardieu C, Netter E, Weber B. Breast carcinoma located in ectopic breast tissue: a case report and review of the literature. Eur J Surg Oncol. 1998;24(3):222–224.

[3] Sadler TW. Langman's Medical Embryology. 13th ed. Philadelphia: Wolters Kluwer; 2015.

[4] Evans DM, Guyton DP. Carcinoma of the axillary breast. Br J Surg. 1995;82(3):312–315.

[5] Velanovich V. Ectopic breast tissue, supernumerary breasts, and supernumerary nipples. South Med J. 1995;88(9):903–906.

[6] Visconti G, Eltahir Y, Van Ginkel RJ, Bart J, Werker PMN. Approach and management of accessory breast tissue in the axilla. Aesthetic Plast Surg. 2011;35(3):427–432.

[7] Shin SJ, Sheikh FS, Allenby PA, Rosen PP. Invasive secretory carcinoma arising in ectopic breast tissue of the axilla. Histopathology. 2001;38(6):523–527.

[8] Nihon-Yanagi Y, Ueda T, Kameda N, Okazumi S. A case of ectopic breast cancer with a literature review. Surg Today. 2011;41(5):698–702.

[9] Cogswell HD, Czerny EW. Carcinoma of aberrant breast of the axilla. Am J Surg. 1961;101:246–248.

[10] Yang WT, Dryden MJ, Gwyn K, Whitman GJ, Theriault RL. Imaging of ectopic breast tissue and breast diseases. AJR Am J Roentgenol. 2001;176(3):647–654.

[11] Ennachit M, El Mghari G, Benider A, et al. Ectopic breast cancer: case report and review of the literature. Pan Afr Med J. 2015;21:67.

[12] Goldhirsch A, Winer EP, Coates AS, et al. Personalizing the treatment of women with early breast cancer: highlights of the St Gallen International Expert Consensus. Ann Oncol. 2013;24(9):2206–2223.

[13] Burstein HJ, Temin S, Anderson H, et al. Adjuvant endocrine therapy for women with hormone receptor–positive breast cancer: ASCO guideline update. J Clin Oncol. 2014;32(21):2255–2269.

[14] National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Breast Cancer. Version 2024.

[15] Muir D, Selvakumar E, Mufti G. Primary carcinoma of ectopic breast tissue. Breast J. 2013;19(5):560–561.

[16] Recht A, Comen EA, Fine RE, et al. Postmastectomy radiotherapy: an American Society of Clinical Oncology clinical practice guideline update. J Clin Oncol. 2016;34(36):4431–4442.

[17] Haviland JS, Owen JR, Dewar JA, et al. The UK Standardisation of Breast Radiotherapy (START) trials of radiotherapy hypofractionation for treatment of early breast cancer: 10-year follow-up results. Lancet Oncol. 2013;14(11):1086–1094.

[18] Taylor CW, Wang Z, Macaulay E, Jagsi R, Duane FK, Darby SC. Exposure of the heart in breast cancer radiotherapy: a systematic review of heart doses published during 2003–2013. Radiother Oncol. 2015;114(1):1–10.

[19] Darby SC, Ewertz M, McGale P, et al. Risk of ischemic heart disease in women after radiotherapy for breast cancer. N Engl J Med. 2013;368(11):987–998.

[20] Offersen BV, Boersma LJ, Kirkove C, et al. ESTRO consensus guideline on target volume delineation for elective radiation therapy of early stage breast cancer. Radiother Oncol. 2015;114(1):3–10.

[21] Early Breast Cancer Trialists' Collaborative Group (EBCTCG). Relevance of breast cancer hormone receptors and other factors to the efficacy of adjuvant tamoxifen. Lancet. 2011;378(9793):771–784.

[22] Recht A, Edge SB, Solin LJ, et al. Postmastectomy radiotherapy: clinical practice guidelines of the American Society of Clinical Oncology. J Clin Oncol. 2001;19(5):1539–1569.

[23] Early Breast Cancer Trialists' Collaborative Group (EBCTCG). Effect of radiotherapy after mastectomy and axillary surgery on 10-year recurrence and 20-year breast cancer mortality. Lancet. 2014;383(9935):2127–2135.

[24] Smith BD, Bentzen SM, Correa CR, et al. Fractionation for whole breast irradiation: an American Society of Radiation Oncology evidence-based guideline. J Clin Oncol. 2011;29(31):4341–4347.

[25] Recht A, Moran MS, Schnitt SJ, et al. Postmastectomy radiotherapy: an evidence-based review. Cancer. 2017;123(12):2219–2231.