

## Case Report

## Inflammatory Myofibroblastic Tumor of the Breast in 64–Year–Old Women

## 64 Yaş Kadın Hastada Memede İnflamatuar Miyofibroblastik Tümör

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## ABSTRACT

**Introduction:** The inflammatory myofibroblastic tumor is rarely located in the breast and, surgical resection is enough for the diagnosis and treatment.

**Case Report:** The patient, a 64-year-old female, was referred to our centre palpable mass in the right breast. Mammography demonstrated a mass of smoothed contour with calcification in the right breast. After three months, segmental mastectomy was planned as the mass grew. Pathological features, micromorphological and immunohistochemical staining have confirmed the lesion as being breast inflammatory myofibroblastic tumor.

**Conclusion:** Inflammatory myofibroblastic tumor of the breast is a rare and intermediate (rarely metastasizing) malignant potential tumor. Due to recurrence and metastasis risk, complete excision with negative margins and regular follow up plays a critical role in treating of inflammatory myofibroblastic tumors.

**Key words:** Breast, mammography, inflammatory myofibroblastic tumor

## ÖZET

**Giriş:** İnflamatuar miyofibroblastik tümör memede nadir olarak yerleşir ve cerrahi rezeksiyon tanı ve tedavi için yeterlidir.

**Olgu Sunumu:** 64 yaşında kadın hasta sağ memede kitle ile merkezimize başvurdu. Mamografide, sağ memede kalsifikasyon ile birlikte düzgün konturlu bir kitle mevcuttu. Üç ay sonra, kitlenin büyümesi nedeniyle segmental mastektomi planlandı. Patolojik özellikler, mikromorfolojik ve immünohistokimyasal boyama lezyonun İnflamatuar miyofibroblastik tümör olduğunu doğrulamıştır.

**Sonuç:** Memenin inflamatuar miyofibroblastik tümörleri nadir ve orta (nadiren metastaz yapan) malign potansiyel bir tümördür. Nüks ve metastaz riski nedeniyle negatif sınırlarla eksizyon ve düzenli takip inflamatuar miyofibroblastik tümör tedavisinde kritik bir rol oynamaktadır.

**Anahtar Kelimeler:** Meme, mamografi, inflamatuar miyofibroblastik tümör

## Introduction

According to the World Health Organization (WHO) classification, inflammatory myofibroblastic tumor (IMT) is an intermediate malignant potential tumor with potential recurrence and rarely metastasis. IMT is located in any part of the body, and it is usually detected in children and young adults. IMT is reported rarely in the breast [1].

## Case report

A 64-year-old woman was referred to our center with a hard, palpable mass in the right breast. The patient is taking medicine for hypertension and hypothyroidism. Also, the patient has been in menopause for ten years and has never had hormone therapy. She had no family history of cancer. There was a palpable mass of approximately 2 centimeters in the upper outer quadrant of the right breast. A lobulated mass lesion with a contoured smooth contour with calcification of 23x17 millimeters in the right breast was observed in mammography. The lesion was reported as BIRADS 0 (Figure 1), and ultrasonography (USG) evaluation was suggested. 20x16 millimeters multilobulated heterogeneous hypoechoic lesion was measured on the upper outer quadrant of the right breast without any other abnormality of the contralateral breast or both axillary regions, and histopathological diagnosis was recommended. USG, guided core needle biopsy performed. Myxoid stroma containing spindle stromal cells with low cellularity and a few breast ducts were observed on histopathologic examination. The patient was admitted three months later due to the growth of the mass. After clinical and radiological re-evaluation, a rebiopsy is recommended. After three months later, on control USG, a 27x20 mm multilobular heterogeneous hypoechoic lesion was observed in the upper outer quadrant of the right breast, and lesion size increased. Segmental mastectomy was planned for the patient to have negative surgical margins. A

well-circumscribed, white-tan coloured mass was measuring about 3,5 cm × 2,7 cm × 2,5 cm was identified in the macroscopic examination of the segmental mastectomy specimen. Microscopic examination showed a well-circumscribed tumor (Figure 2A, 2B) composed of spindle cells arranged in fascicles mixed with an inflammatory infiltrate containing lymphocytes and plasma cells (Figure 2 C). The stroma showed focal myxoid to hyalinized collagenous fibrovascular tissue. A multilayered concentric proliferation of spindle cells around blood vessels was observed (Figure 3A). Obliterative phlebitis was not observed. Nuclear atypia was not seen. Three typical mitoses were seen in 10 high power fields. There was no atypical mitosis. Immunohistochemical analysis showed focal positive staining for smooth muscle actin (Cell Marque, 1A4, monoclonal) (Figure 3 B), CD34 (Ventana, QBEnd/10, monoclonal) (Figure 3C) and ER receptor (Ventana, SP1, monoclonal) (Figure 3D). Immunohistochemistry showed negative staining for anaplastic lymphoma kinase (ALK) (Ventana, ALK01, monoclonal), S100 (Ventana, 4C4.9, monoclonal), pan CK (Cell Marque, AE3, monoclonal), MUC4 (Cell Marque, 8G7, monoclonal), HNF35 (Cell Marque, monoclonal), desmin (Ventana, DE-R-11, monoclonal), B catenin (Cell Marque, 14, monoclonal) and C-kit (Ventana, 9.7, monoclonal). The surgical resection margins were tumor-free. Inflammatory myofibroblastic tumors were diagnosed based on the morphology and the immunohistochemical features. The patient was called for control 6 months later. No pathology was detected in the examination.

## Discussion

IMT is a mesenchymal neoplasm composed of spindle cells with myofibroblasts' morphologic features and intermingling with plasma cells and other inflammatory cells.

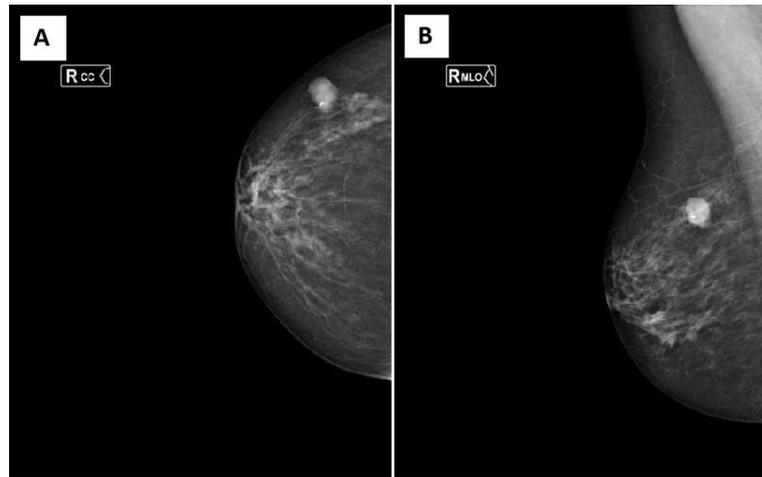


Figure 1. On mammography a lobulated mass lesion with a smooth contour with calcification was observed. (A) Craniocaudal view; (B) mediolateral view.

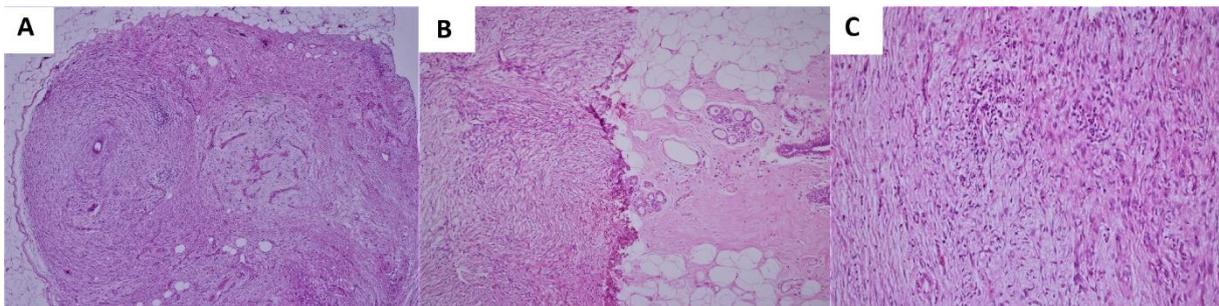


Figure 2. (A)- A well- circumscribed tumor composed of spindle cells in the breast (H-E, x40) (B)- A well- circumscribed tumor with breast parenchyma (H-E, x100) (C)- Tumor shows fascicular growth pattern and is composed of spindle cells admixed with aggregates of inflammatory infiltrate containing lymphocytes and plasma cells (H-E, x200).

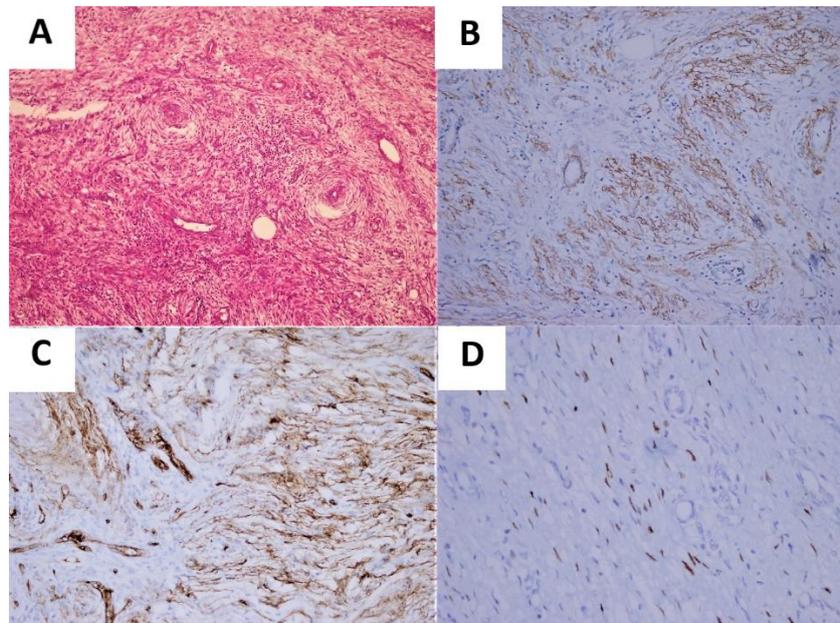


Figure 3. (A)- A multilayered concentric proliferation of spindle cells around blood vessels (H-E, x 200) (B)- Focal smooth muscle actin positivity in tumor cells (C)- Focal CD34 positivity in tumor cells (D)- ER receptor positivity in tumor cells.

The aetiology of IMT is unknown [1,2]. At first, researchers thought that IMT was an autoimmune or reparative postinflammatory condition. Currently, IMT is defined a neoplastic process with potential recurrence and rarely metastasis.[3]. Recent molecular studies showed that chromosome 2p23 of anaplastic lymphoma kinase (ALK) rearrangements in 50% of IMTs patients [4].

IMTs have been encountered virtually in any anatomical location. The most common site of involvement is in the lung. Extrapulmonary sites include the mesentery and omentum, soft tissue, pelvis, mediastinum, bone, larynx, central nervous system [5]. IMTs rarely occur in the breast [2].

Most patients with IMT on the breast present with a palpable mass, which is sometimes detected in screening mammography [5, 6]. IMT on the breast is primarily seen in women, sometimes in men [4]. IMT can be observed in both breasts simultaneously [7]. In addition, it has been reported that the same patient may be located in different organs with the breast [7]. Mammography and ultrasonography showed nonspecific features of IMT's of the breast. IMT can see as hypo-hyperechoic, smooth or irregularly circumscribed lesions on ultrasonographic images [5, 8, 9,10]. It has also been reported to co-occur in patients with breast cancer [6]. In our case, it was described a multilobulated heterogenous hypoechoic lesion in ultrasonography.

IMTs of the breast are lack typical clinical and radiological characteristics. It was diagnosed at pathological examination after resection of the mass. IMTs are diagnosed based on their pathological appearance and, breast IMTs have the same morphological features arising in other sites. Breast IMT should be differentiated from other spindle cell lesions of the breast ranging from reactive tumor-like lesions to high-grade malignant tumors. The distinction may be challenging in small biopsies. Histomorphological features and

immunohistochemistry facilitate the correct diagnosis of an excised specimen. Diagnostic features are  $\alpha$ -smooth muscle actin positive spindle cells admixed with inflammatory cells composed of plasma cells and lymphocytes and ALK expression by immunohistochemistry or ALK gene rearrangement. Nevertheless, approximately 50% of IMT patients have ALK gene rearrangement. There is a good correlation between ALK immunohistochemistry and the ALK gene rearrangement by FISH analysis [4,6]. In our case, ALK was negative.

Previous studies have indicated that ALK-negative IMTs are more diagnosed at a higher age, associated with metastases and histological differences from ALK-positive IMTs. There is a higher degree of nuclear pleomorphism, atypical atypia mitoses detected in ALK-negative IMTs [4,11]. IMT is more commonly seen in children and young adults, but a broad age range has been documented [4]. Our case was 64 years old. Nuclear atypia and atypical mitoses were not identified.

IMTs recurrence rate is 2% for pulmonary tumors and 25% for extrapulmonary lesions [11]. The recurrence rate depends on ill-defined morphology, tumor size, multifocality, the success of the surgical resection [11]. Also, a high degree of atypia, the presence of ganglion-like cells, increased mitotic figures, high Ki-67 proliferative index, the absence of ALK reactivity, oncogenetic protein overexpression (p53) is associated with potential aggressive growing, recurrence and malignancy [11,12]. For this reason, complete surgical resection of IMTs is mandatory. [3] Distant metastasis of IMTs is 5% of the cases [1, 13]. The metastatic IMTs cases are characterized by a broad range of age and primary sites, metastases typically developed in the lungs, brain, liver and bone [12]. In addition to this, metastasis to the lymph nodes or the mediastinum were detected only two cases [13].

IMTs of the breast are unusual conditions and can be confused with malignancy [9]. Malignant course, recurrence and metastasis of IMTs are also rare [8]. Until today a few cases of IMT has been reported in the male breast [4]. Surgical margin negative wide excision is sufficient. Cases that developed recurrence despite negative surgical margins have been reported [12]. Wide excision with negative margins or simple mastectomy is recommended for a patient with IMT of the breast [6, 8]. In this case, excision was made with a negative surgical margin. Incomplete resection is associated with a high risk for recurrence of IMT. IMT recurrence rate was detected at 25% in the other anatomical location [12]. In this case, recurrence was not detected in the eight month follow up periods. Axillary lymph node management is unclear in the cases of breast IMT. If axillary lymph node metastasis suspicion exists, wide local excision with sentinel lymph node biopsy or modified radical mastectomy should be performed [6]. However, some research suggests that routine SNLB is unnecessary

because of lymphatic spread of the lesion is unusual [8]. A case of breast inflammatory myofibroblastic tumor with internal lymph node and supraclavicular lymph node metastasis has been reported [14]. Other treatment options for IMTs of the breasts in the literature are corticosteroids, chemotherapy, radiotherapy and immunomodulation. Some reports show that corticosteroids are helpful with treatment [15]. There are sporadic cases treated with chemotherapy and anti-inflammatory agents in two studies [10]. Although this results, more investigation is needed for treatment strategy for IMTs of the breasts.

### Conclusion

IMTs of the breast is a rare and intermediate (rarely metastasizing) malignant potential tumor. Due to recurrence and metastasis risk, complete excision with negative margins and regular follow up plays a critical role in treating IMTs.

### REFERENCES

1. Coffin CM, Fletcher JA. Inflammatory myofibroblastic tumor. In CDM Fletcher, JA Bridge, PCW Hogendoorn, F Mertens (Eds) WHO classification of tumors of soft tissue and bone, 4th ed, pp: 83-84, Lyon, WHO press.
2. Magro G., Salvatorelli L. Inflammatory Myofibroblastic Tumor of the Breast. In: van Krieken J. (eds) Encyclopedia of Pathology. Encyclopedia of Pathology. 2018, Pp: 185-191, Springer, Cham.
3. Coffin CM, Watterson J, Priest JR, Dehner LP. Extrapulmonary inflammatory myofibroblastic tumor (inflammatory pseudotumor) a clinicopathologic and immunohistochemical study of 84 cases. *Am J Surg Pathol.* 1995; 19(8): 859-872.
4. Coffin CM, Hornick JL, Fletcher CD. Inflammatory myofibroblastic tumor: comparison of clinicopathologic, histologic, and immunohisto-

chemical features including ALK expression in atypical and aggressive cases. *Am J Surg Pathol.* 2007; 31(4): 509-520.

5. Choi EJ, Jin GY, Chung MJ, Moon WS, Youn HJ. Primary inflammatory myofibroblastic tumors of the breast with metastasis: radiographic and histopathologic predictive factors. *J Breast Cancer.* 2015; 18(2): 200-205.

6. Li J, Yun W, Qin J, Zhao J, Liu X, Wu J, et al Inflammatory myofibroblastic tumor of the breast coexisting with breast cancer: a case report. *Breast Care (Basel).* 2013; 8(4): 290-292.

7. Lv X, Ye J, Jiang G, Wang Y, Lv J, Wang Y. Simultaneous multiple primary cancers with concomitant inflammatory myofibroblastic tumor: a case report. *Int J Clin Exp Pathol.* 2020; 13 (5): 1212-1215.

8. Markopoulos C, Charalampoudis P, Karagiannis E, Antonopoulou Z, Mantas D. Inflam-

matory myofibroblastic tumor of the breast. Case Rep Surg. 2015; 2015: 705127.

9. Bosse K, Ott C, Biegner T, Fend F, Siegmann-Luz K, Wallwiner D, et al 23-year-old female with an inflammatory myofibroblastic tumor of the breast: a case report and a review of the literature. Geburtshilfe Frauenheilkund. 2014; 74(2): 167-170.

10. Gleason BC, Hornick JL. Inflammatory myofibroblastic tumors: where are we now? J Clin Pathol. 2008; 61: 428-437.

11. Yip CH, Wang KT, Samuel D. Bilateral plasma cell granuloma (inflammatory pseudo-tumor) of the breast. ANZ J Surg 1997; 67: 310-2.

12. Zhao HD, Wu T, Wang JQ, Zhang WD, He XL, Bao GQ, et al Primary inflammatory myofibroblastic

tumor of the breast with rapid recurrence and metastasis: a case report. Oncol Lett. 2013; 5(1): 97-100.

13. Trojan A, Stallmach T, Kollias S, Pestalozzi BC. Inflammatory myofibroblastic tumor with CNS involvement. Onkologie, 2001; 24(4): 368-372.

14. Zhou Y, Zhu J, Zhang Y, Jiang J, Jia M. An inflammatory myofibroblastic tumor of the breast with ALK over expression. BMC Case Rep. 2013;4; 2013: bcr0720114474.

15. Bonnet JP, Basset T, Dijoux D. Abdominal inflammatory myofibroblastic tumors in children: report of an appendiceal case and review of the literature. J Pediatr Surg. 1996 31(9): 1311-1314.

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