

Mixed Mucinous Carcinoma Of The Breast In Young Female Patient : Case Report

ABSTRACT: Mucinous carcinoma of the breast, also known as colloid carcinoma, is a rare histological form characterized by abundant mucin production. It accounts for only 1–7% of all infiltrating carcinomas of the breast. It has a better prognosis than the usual ductal breast carcinoma, with 90% survival at 10 years and a higher incidence in peri- and post-menopausal patients. Fewer cases have been reported in younger patients. Based on the presence or absence of concomitant areas with typical infiltrating ductal carcinoma, it can be classified as pure or mixed mucinous. However, it is important to note that the pure mucinous type has a better prognosis than the mixed type. Histopathology is confirmatory in all cases. The primary protocol of treatment for patients suffering from mucinous breast carcinoma is surgery with post-operative adjuvant treatment: radiotherapy, chemotherapy, and endocrine therapy. Here, we present the case of a 29-year-old female patient presented with left breast swelling of 2 years duration who was found to have mixed mucinous breast carcinoma and was treated with modified radical mastectomy and chemotherapy. To our knowledge, there is no similar case reported in our country, and there are few case reports worldwide with the diagnosis of mixed mucinous carcinoma at a young age.

AUTHORS: Teketel Tadesse Geremew, Abraham Kassahun Tadele, Abebaw Amare Wadago, Ghion Getenet Engida, Tigist Gutema Tesgera, Kalkidan Molla Tegengne, Melaku Teshale Gemechu, Fasika Getahun Mengistu, Yazachew Mossu Ayalew

INSTITUTIONS:

1. Hawassa University
2. Wendogenet Hospital

KEYWORDS: Mixed mucinous breast cancer, Breast neoplasms, Young age, Breast conserving surgery

Introduction

Mucinous carcinoma (MC) of the breast, also known as colloid carcinoma, is a rare histological form characterized by excess mucin production [1]. It represents 1–7% of all infiltrating carcinomas of the breast. MC has a better prognosis than the usual ductal breast carcinoma, with 90% survival at 10 years and a higher incidence in peri- and post-menopausal patients. However, women under the age of 35 account for only 1% of cases [2], and our case is among this rare group. Pathologically, MC is divided into two subtypes: pure and mixed. The distinction between these subtypes is based on the quantification of cellularity. The mucinous component varies from 50% to more than 90% of the tumor; it is considered pure when the mucinous component comprises > 90% of the tumor and mixed when the mucinous component comprises 50–90% of the tumor [3]. In general, mucinous carcinoma represents an excellent prognostic histological variant due to its positivity to ER and PR and negativity to HER receptors [4].

Case report

A 29-year-old nulliparous female patient from Sidama region, Ethiopia, presented with swelling over the left breast of 2 years duration. Initially, the swelling was small and pea-sized, but gradually it increased in size to attain the current size, which is about 4x4 cm. She was on hormonal oral contraceptive for the past 4 years. She did not have any other site swelling. There was no family history of the disease.

On physical examination, her vital signs were stable with blood pressure 115/70 mmHg, pulse rate 68 beats per minute, oxygen saturation 96%, and temperature 37.4 °C. Lymphoglandular examination revealed a 4x4 cm non-tender firm mass fixed to underlying structures and more on the upper outer quadrant. There were non-tender shotty lymphadenopathies over the ipsilateral axilla, the largest measuring 1.5x1 cm.

On laboratory tests A complete blood count and organ function tests were normal (Table 1). Breast Ultrasound: 5x3 cm BIRAD V left breast mass with ill-defined border in upper outer quadrant. There is an enlarged

round axillary hypoechoic lymph node, the largest measuring 2.5 cm on the short axis.

The lesion’s fine needle aspiration cytology (FNAC) results showed tight clusters and single-cell malignant ductal cells set in an abundant mucin lake. This led to the conclusion of a mucinous carcinoma. Hence, a biopsy was recommended. Following the above provisional diagnosis, the patient and her family were counseled for modified radical mastectomy (MRM). Therefore, an excisional biopsy with a possible gross tumor-free margin was done, and the specimen was sent for histopathologic confirmation. A gross evaluation of the biopsy specimen revealed a 5x3 cm firm gray-white to gray-brown solid mass over the right upper quadrant; all margins are free. Seven lymph nodes were identified, and all are embedded (Figs. 1 and 2). The histopathologic microscopic examination revealed mixed mucinous carcinoma with a ductal carcinomatous component representing 30% of the tumor volume (Figure 3-5). The immunohistochemistry panel was done. ER was positive, PR was positive, and HER 2 was negative with a high Ki67-10%. (Figure 6-8)

Following a multidisciplinary team meeting, a metastatic workup was obtained. CT of the thorax,

abdomen, and pelvis showed no evidence of metastatic disease. Laboratory data showed normal hemoglobin and renal function. Being ER, PR breast cancer, staged as pT2NOMO, the patient was proposed for neoadjuvant chemotherapy with a weekly base schedule. The tumor response was closely monitored during the entire treatment, and she has shown a rapid clinical response since the first cycle. Currently, she is on follow-up every 3 months.



Figure 1: Modified radical mastectomy specimen measuring 9x6 cm with intact and central nipple. covering ellipse of skin measuring 6x4cm .

Table 1: Laboratory results report

Parameters	Results	Normal range
WBC	7,400	3,500-11,000
Neutrophils	64.1%	50-70%
Lymphocytes	28.2%	20-40%
Mixed	7.1%	3-15%
Hemoglobin	12	12.5-16.3g/dl
ESR	10	2-20mm/hr
Creatinine	1.1	0.5-1.2mg/dl
Urea	27	10-50mg/dl
ALT	37	0-40 IU
AST	22	0-40 IU
HBV	Negative	Negative
HCV	Negative	Negative
PICT	Negative	Negative



Figure 2: A cut surface of the specimen revealed 5x3 cm firm gray white to gray brown solid mass , all margins are free

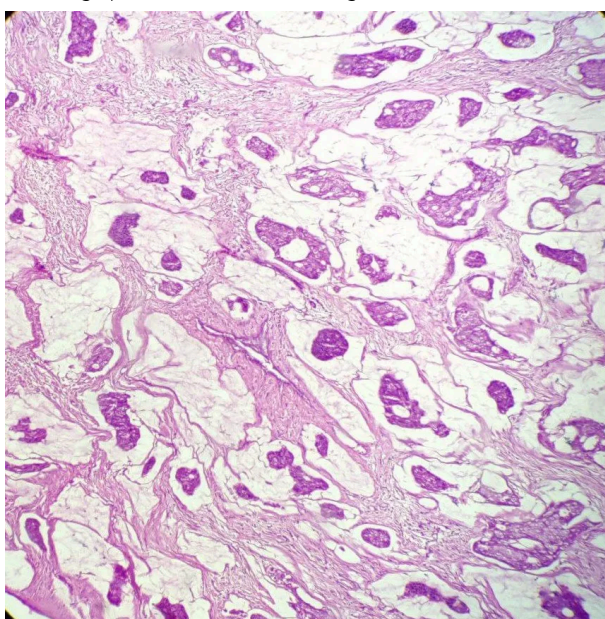


Figure 3: low power view(4x): Nests, cribriform and trabecula's of pleomorphic round to oval cells floating in mucin lake

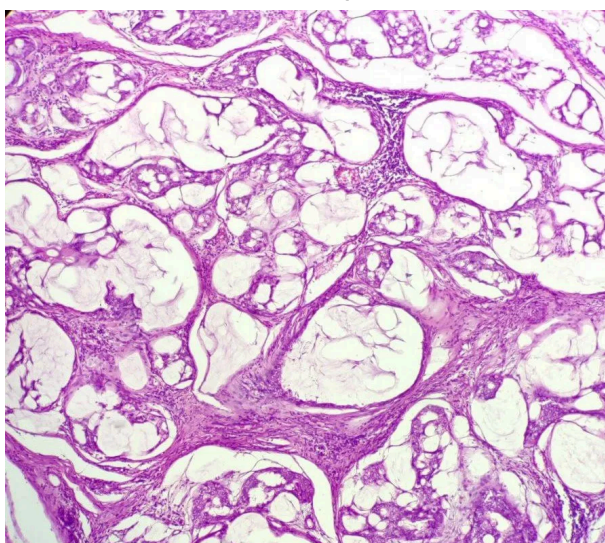


Figure 4: Mid power view(20x): Nests, and cribriform of pleomorphic round to oval cells floating in mucin lake set in desmoplastic and inflamed stroma

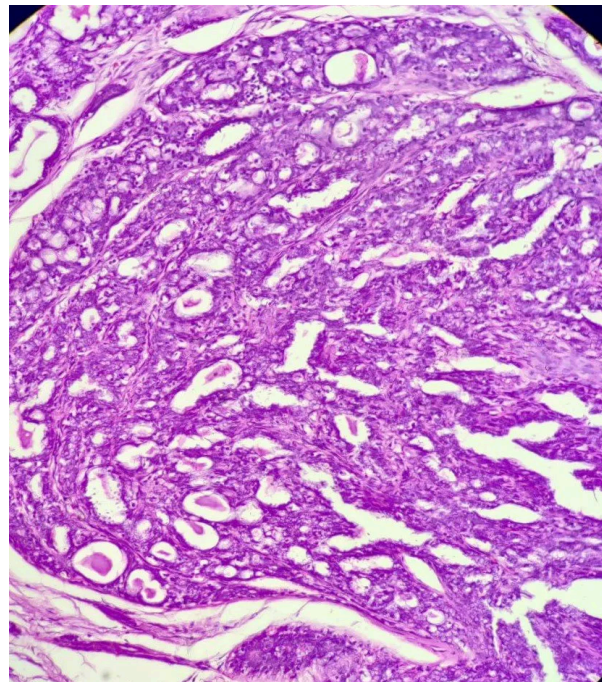


Figure 5: High power view(40x) : Solid sheets and nests of pleomorphic round to oval cells with absent basal myoepithelial cells set in desmoplastic stroma.

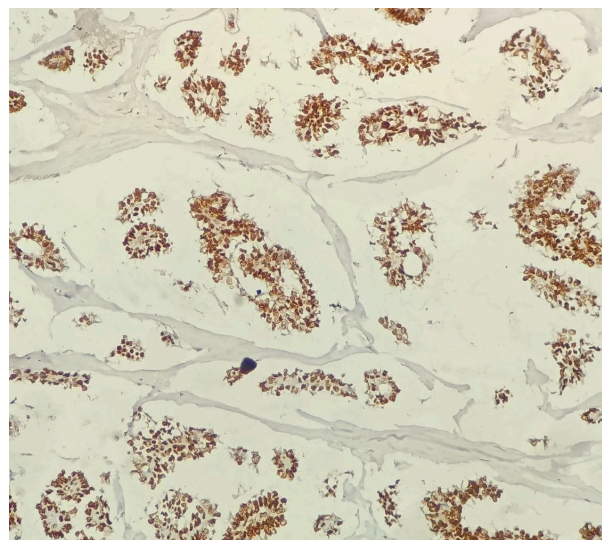


Figure 6: ER nuclear stain shows diffuse positivity with strong intensity

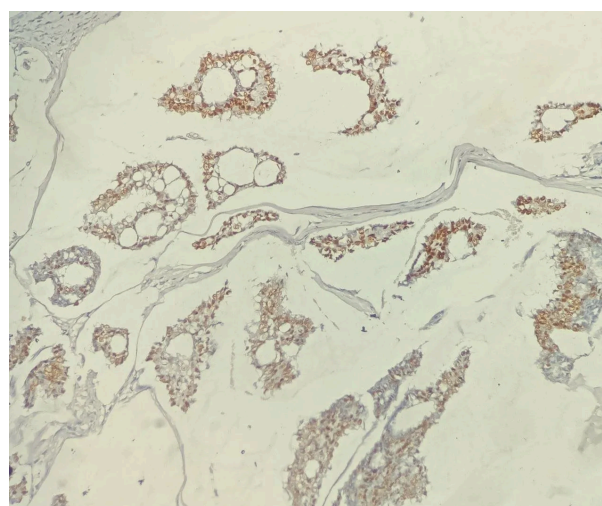


Figure 7: PR nuclear stain: diffuse positivity with strong intensity

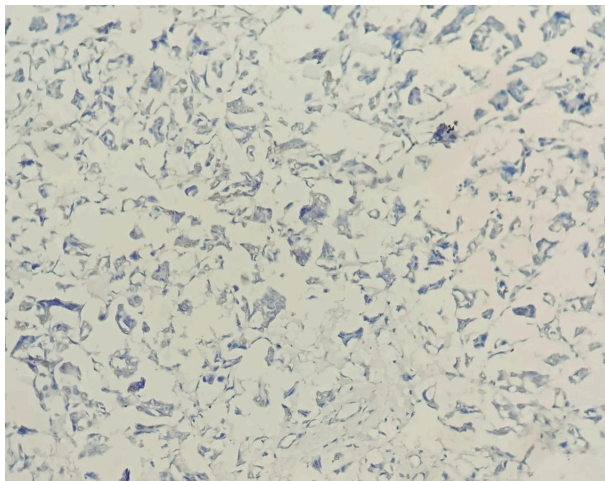


Figure 8: HER 2 membrane stain shows negative staining

Discussion

The World Health Organization (WHO) defined mucinous carcinoma of the breast as a carcinoma containing a large amount of extracellular epithelial mucus, enough to be visible grossly and recognizable microscopically surrounding and within tumor cells [5]. It tends to occur at an older age, with an average age of 67 years, and carries a better prognosis compared to other breast cancer types [6,7]. The incidence among younger patients is less than 1% [6] and, our patient falls into this unusual age category. Breast cancer in young women (BCYW) is usually considered as breast cancer occurring in women younger than 40 years and is the most frequent cancer-related cause of death in these patients [8]. In a series of 3482 patients with pure mucinous carcinomas, 13% were under the age of 50. Similarly, a review of 65 patients had an age range of 31-65 years, thus making our patient the youngest in comparison to this series [9]. The incidence rate for African-American women under age 35 is more than twice the rate for white women of similar age, and the mortality rate is more than three times higher [10].

Breast cancer in women under 40 years of age differs from breast cancer in older women in numerous clinical, pathological and biological features. Clinically, the younger age women had higher incidence of such risk factors as a family history of breast cancer, earlier menarche, more frequent nulliparity and hormonal exposure in the form of oral contraceptive [11], among this risk factors our patient was nulliparous and she was on hormonal oral contraceptives. From the pathological point of view, high incidence of poorly differentiated tumors is found in young patients as compared to the elderly's, in contrast our patient were

diagnosed with rare low grade tumor. Biological evaluation of BCYW seems to be associated with higher tumor grade, negative hormone receptors, human epidermal growth factor receptor 2 (HER2) overexpression and a high proliferation value such as Ki 67 compared with breast cancer in older women in contrast our patient case was ER & PR positive with HER 2 negative profile which makes it low grade tumor. Moreover, growing evidence shows higher recurrence and death rates in BCYW[12].

Breast cancer arising in women under 40 years has a more aggressive profile than those of older patients [13]. Breast-conserving surgery with subsequent chemo-radiotherapy has become the treatment of choice in young women with breast neoplasm. It was found to be comparable to mastectomy for distant disease-free and overall survival. However, following breast-conserving surgery and chemo-radiotherapy, recurrence in the preserved ipsilateral breast occur at an average rate of 1-2% per year, accumulating to approximately 15% after ten years [14].

Conclusion

Mucinous carcinoma represents a histological variant commonly reported in postmenopausal patients. To our knowledge, there are very few reported cases of this histological variant in young patients (<1%), with this patient being reported as among the lowest ages in the literature, so physicians should know that mucinous carcinoma can present at young ages. Distinctions between pure and mixed mucinous carcinoma are very important for prognostication.

REFERENCES

1. Di Saverio S GJAE. A retrospective review with long term follow up of 11,400 cases of pure mucinous breast carcinoma. *BreastCancer Res Treat*, 2008 Oct; 111(3): 541-7. [\[crossref\]](#)
2. I. K. Komenaka et al. «Pure mucinous carcinoma of the breast», *The American Journal of Surgery*, 2004; 187(4): 528-532.
3. S. Sharma, R. Bansal, A. Khare, N. Agrawal Mucinous carcinoma of breast: cytodiagnosis of a case *J. Cytol.*, 28 (2011), pp. 42-44. [\[crossref\]](#)
3. I. Chtourou et al. «[Pure colloid carcinoma of the breast: anatomoclinical study of seven cases]», *Cancer Radiother*, 2009; 13(1): 37-41.
- 6.K. Anan et al., «Pathological features of mucinous carcinoma of the breast are favourable for breast-conserving therapy», *Eur J Surg Oncol*, 2001; 27(5): 459-463. [\[crossref\]](#)

4. S.G. Diab GMCKO et al. Tumor characteristics and clinical outcome of tubular and mucinous breast carcinomas J. Clin. Oncol., 17 (1999). [\[crossref\]](#)
5. Azzopardi JG COHW et al. The World Health Organization histological typing of breast tumors—second edition.
6. K.Y. Ha PDWD. Invasive mucinous carcinoma of the breast Proc. (Bayl. Univ. Med. Cent.), 26 (2013), pp. 295-297. [\[crossref\]](#)
7. Toikkanen S KH. Pure and mixed mucinous carcinomas of the breast: a clinicopathologic analysis of 61 cases with long-term follow-up.
8. Fernandes U GGMD et al. Breast cancer in young women: a rising threat: A 5-year follow-up comparative study. Porto Biomed J. 2023;8(3):e213. [\[crossref\]](#)
9. Lam WWM CWTGMTKAJRoentgenol. Sonographic appearance of mucinous carcinoma of the breast.
10. SHAVERS VL HLSJ. Racial/ethnic variation in clinical presentation, treatment, and survival among breast cancer patients under age 25.
11. M AHUE-GIANGRECO M UGSHJBL. Induced abortion, miscarriage, and breast cancer risk of young women. Cancer Epi demio.
12. Cardoso F LSPO et al. The European Society of Breast Cancer Specialists recommendations for the management of young women with breast cancer. .
13. M. BATORI MRECASGMLPGCMBMCC. Breast cancer in young women: case report and a review.
14. SEYNAEVE C VLVDL et al. Ipsilateral breast tumour recurrence in hereditary breast cancer following breast-conserving therapy. E