CASE REPORT

Congestive Heart Failure Mimicking Inflammatory Breast Carcinoma: A Case Report and Review of the Literature

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Abstract: Inflammatory breast cancer is a rare but highly malignant form of breast cancer. Biopsy and histologic examination usually confirm the diagnosis. There are rare reports of difficulties in differentiating this particular type of breast malignancy from congestive heart failure (CHF). This difficulty arises when CHF is associated with unilateral breast edema and skin thickening. However, inflammatory breast carcinoma has distinctive histologic and microscopic characteristics allowing the establishment of a proper diagnosis. We report the case of a 65-year-old woman with CHF associated with unilateral breast edema and skin thickening simulating inflammatory breast carcinoma on mammography.

Key Words: breast carcinoma, cardiac failure, inflammation

Inflammatory breast carcinoma (IBC) is highly malignant and comprises about 1–2% of all breast cancer cases. The diagnosis is usually based on three clinical criteria: erythema, peau d’orange, and wheals of skin of the breast (1). The confirmation of underlying breast cancer is usually by biopsy and histology. Unilateral breast skin thickening simulating IBC has been reported in a few other conditions such as lymphomas, leukemia, nephrotic syndrome, and following breast irradiation (2). To our knowledge, after a search of the world literature, only a few cases of congestive heart failure (CHF) simulating IBC have been reported (2–5). We report one patient who was initially suspected of having IBC but was found to have unilateral breast edema and induration secondary to CHF.

CASE REPORT

A 65-year-old woman with a history of hypertension was admitted to the medical department for management of shortness of breath and edema of both legs. On physical examination the right breast was diffusely thickened and enlarged with some induration. The left breast appeared normal. Mild bilateral rales were present on auscultation of the lung bases. The initial chest roentgenograph showed evidence of CHF (Fig. 1). The patient was placed on diuretic therapy and a mammogram was obtained to evaluate the breast changes. This showed dense architecture of the right breast with diffuse skin thickening indistinguishable from those seen
in IBC (Fig. 2). The patient responded well to the treatment of her cardiac failure with resolution of the pulmonary congestion. The induration of the right breast resolved with improvement of the heart failure. Repeat mammogram demonstrated resolution of the unilateral breast abnormality (Fig. 3). The patient was discharged home after 14 days. At 6 months follow-up, the patient was doing well with no evidence of IBC.

**DISCUSSION**

The presence of unilateral thickening of breast skin coupled with induration raises the suspicion of IBC. The thickening of the skin is usually a result of edema. The peau d’orange represents exaggerated hair follicle pits secondary to tumor blockage of the lymphatic channels. In later stages the lymphatics become filled with tumor emboli. It is generally believed that the skin thickening is not necessarily due to skin invasion by tumor.

Unlike in IBC, the edema with skin thickening seen in some cases of CHF is usually bilateral. As such there is no clinical suspicion of IBC in these cases. In rare instances, the skin thickening over the breast associated with CHF may be unilateral and exhibit induration, thus simulating breast cancer. There is no clear explanation for the unilateral nature of the breast changes in

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**Figure 1.** Initial anteroposterior chest X-ray showing evidence of congestive heart failure.

**Figure 2.** Initial right mediolateral mammogram showing features simulating inflammatory breast cancer.

**Figure 3.** Follow-up right mediolateral mammogram shows resolution of breast changes.
these patients. Some have postulated that the tendency of the patient to lie on one side, resulting in dependent edema, may explain the unilateral breast changes (2). Whatever the etiology of breast edema, the underlying pathophysiology is usually lymphatic obstruction. In CHF, the increased venous pressure results in elevated interstitial pressure, which in turn increases lymphatic pressure.

The mammographic findings in the patient with unilateral breast edema and overlying skin thickening secondary to heart failure may be indistinguishable from those seen in IBC. There is diffuse skin thickening and increased stromal density in the ipsilateral breast. Treatment of the underlying heart failure results in complete resolution of the mammographic changes as seen in our patient. A list of other causes of unilateral diffuse breast skin thickening is shown in Table 1.

We found four previous reports of heart failure simulating IBC after a search of the world literature (Table 2). The common finding in all the previously reported cases and in our patient is the resolution of the breast changes with treatment of the underlying cardiac failure. Pluchinotta et al. (3) suggested that the clue to the correct diagnosis of CHF in these patients is the presence of “pitting” edema of the breast, which is not found in malignant breast edema. This was not the case in our patient, who had nonpitting edema. In our opinion, the unilateral breast edema and thickening in CHF results from elevated lymphatic pressure and as such may not be pitting.

### CONCLUSION

Patients in whom a diagnosis of IBC is entertained based on clinical examination and mammogram must be examined for other rare causes of diffuse unilateral breast edema and thickening. In cases with underlying CHF, resolution of the breast changes is expected with appropriate treatment. A high index of suspicion is required in order to minimize unnecessary breast biopsies and surgery.

### REFERENCES

1. Singletary SE, Ames FC, Buzdar AU. Management of inflammatory breast cancer. *World J Surg* 1994;18:87–92.
2. Muller JWT, Koehler PR. Cardiac failure simulating inflammatory cancer of the breast. *Fortschr Rontgenstr* 1984;140:441–44.
3. Pluchinotta AM, De Min V, Presacco D, Reschiglian E, Tasinato R. Unilateral edema of the breast secondary to congestive heart failure: report of 2 cases. *Minerva Chir* 1994;49:1171–74.
4. Doyle AJ. Unilateral breast edema in congestive heart failure—a mimic of diffuse carcinoma. *Australas Radiol* 1991;35:274–75.
5. Lindhardt F. Unilateral breast edema in chronic heart disease. *Ugeskr Laeger* 1981;143:1536–37.

### Table 1. Conditions Associated with Diffuse Breast Edema and Thickening

| Condition                                                   |
|-------------------------------------------------------------|
| Inflammatory breast carcinoma                               |
| Mastitis                                                    |
| Changes secondary to radiotherapy                           |
| Nephrotic syndrome                                          |
| Congestive heart failure                                    |
| Lymphoma                                                    |
| Progressive systemic sclerosis                              |
| Superior vena cava syndrome                                 |
| Leukemia                                                    |
| Lymphatic permeation from contralateral breast carcinoma    |
| Pemphigus and other skin conditions                         |

### Table 2. Previously Published Reports of Unilateral Breast Edema in Cardiac Failure Simulating Inflammatory Breast Cancer

| Reference | Year | Number of patients |
|-----------|------|--------------------|
| 5         | 1981 | 1                  |
| 2         | 1984 | 2                  |
| 4         | 1991 | 1                  |
| 3         | 1994 | 2                  |