Case Report

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Inflammatory Carcinoma in a 50-Year- Old Female Patient

Paolo Izzo [1,*], Luciano Izzo [1], Daniele Santini [3], Vincenzo Bianco [3], Andrea Polistena [1], Simone Sibio [1], Massimo Codacci-Pisanelli [1], Daniele Crocetti [1], Claudia De Intinis [1] and Sara Izzo [2]

[1] Department of Surgery "Pietro Valdoni", Policlinico "Umberto I", Rome "Sapienza" University of Rome, Rome; p-_izzo@hotmail.it, deintinis.1891513@studenti.uniroma1.it, luciano.izzo@uniroma1.it, simone.sibio@uniroma1.it, andrea.polistena@uniroma1.it, massimo.codacci@uniroma1.it, daniele.crocetti@uniroma1.it

[2] Department of Medical, Surgical, Neurologic, Metabolic and Ageing Sciences, Unit of Colorectal Surgery, University of Campania "Luigi Vanvitelli"; sa_izzo@hotmail.it

[3] Department of Pathology, Oncology and Radiology, Sapienza University of Rome, 00161 Rome, Italy; daniele.santini@uniroma1.it, vincenzo.bianco@uniroma1.it

* Correspondence: luciano.izzo@uniroma1.it; Tel.: +39-3470103722

Abstract: (1) Background: This case presents a rare and challenging clinical scenario involving a 50-year-old female patient diagnosed with Inflammatory Carcinoma, a particularly aggressive and rapidly growing form of breast cancer. The expected age of diagnosis of this type of breast cancer is younger (normally up to 40 years), which make the current case more interesting. The disease is characterized by heat, redness, swelling and noticeable changes in the breast's skin texture, resembling the skin of an orange (peau d'orange). This case is important because it contributes to the limited clinical literature on such aggressive forms of breast cancer.; (2) Case presentation and Methods: The multidisciplinary approach was employed. Diagnostic procedures such as imaging tests, biopsy, and histopathological examination were performed to confirm the diagnosis of Inflammatory Carcinoma and assess the extent of the disease. The presence of the HER2 protein on the tumor cells supported the selection of a combination therapy involving systemic chemotherapy and targeted biological therapy.; (3) Discussion: The patient responded positively to the combination therapy consisting of systemic chemotherapy and targeted biological therapy. The aggressive nature of Inflammatory Carcinoma, characterized by rapid growth and distinct skin changes, was effectively addressed. The presence of the HER2 protein on the tumor cells indicated the potential efficacy of the combination therapy in aggressive forms of breast cancer.; (4) Conclusions: This case highlights the critical importance of a multidisciplinary approach in managing complex cases of breast cancer, especially rare and aggressive subtypes like Inflammatory Carcinoma. The positive response of the patient to the combination therapy involving systemic chemotherapy and targeted biological therapy demonstrates the potential for favorable outcomes in aggressive disease presentations.

Keywords: inflammatory breast carcinoma; targeted biological therapy; HER2 overexpression; multidisciplinary treatment; aggressive cancer management; systemic chemotherapy

1. Introduction

Breast cancer is a heterogeneous disease encompassing a wide range of subtypes that exhibit distinct clinical behaviors and responses to treatment.[1] Among these subtypes, Inflammatory Breast Carcinoma (IBC) stands out due to its aggressive clinical course, rapid onset, and unique presentation.[2] This subtype is relatively rare, accounting for only 1-5% of all breast cancer cases, yet it is highly lethal and is characterized by a poorer prognosis than other types of breast cancer.[3] The name 'inflammatory' is derived from the characteristic signs of the disease that closely resemble those of a breast inflammation: redness, heat, and swelling, often associated with skin changes such as peau d'orange.[4]

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The fundamental molecular biology of Inflammatory Breast Carcinoma is still not entirely understood, which creates substantial challenges in diagnosis and treatment.[5] A typical diagnostic criterion is the rapid onset of these symptoms, along with the pathological identification of invasive carcinoma.[6] Traditional imaging methods often struggle to capture the extent of the disease, owing to the diffuse involvement of the breast tissue, further complicating the disease's management.[7]

HER2 (Human Epidermal growth factor Receptor 2) overexpression is frequently observed in patients with IBC.[8] The HER2 protein promotes the growth of cancer cells, and its presence generally indicates a more aggressive form of the disease.[9] However, it also presents an

opportunity for targeted treatment using HER2 inhibitors, a form of biological therapy.[10]

The aggressive nature of IBC necessitates an integrated multidisciplinary approach to treatment. Chemotherapy, targeted therapy, surgery, and radiation therapy are typically used in various combinations, depending on individual patient factors[11]. Despite the disease's aggressive nature, certain patients respond exceptionally well to this comprehensive therapeutic approach. This case study presents such a patient – a 50-year-old female diagnosed with IBC, who exhibited an excellent response to a combination of systemic chemotherapy and targeted biological therapy. The study is of significant clinical interest due to the rarity of IBC, the aggressive nature of the disease, the diagnostic and therapeutic challenges posed, and the patient's excellent

response to the treatment regimen. It contributes to the ongoing understanding of managing such complex cases effectively and has broad implications for future clinical practice.

2. Case presentation and Methods

The patient at the center of this case study is a 50-year-old premenopausal woman who presented to the clinic with rapidly progressing signs of breast inflammation. Apart from the alarming changes in her breast, the patient's past medical history was notable for hypertension, which was under control with medication. The patient had no known allergies, did not smoke or consume alcohol, and maintained a balanced diet. On initial examination, her left breast was noticeably swollen, red, and warm to the touch. The skin of her breast had undergone noticeable changes, resembling the texture of an orange peel, a condition clinically referred to as peau d'orange. These clinical signs, coupled with the rapid progression of symptoms, raised immediate concerns for Inflammatory Breast Carcinoma, an aggressive and rapidly developing form of breast cancer.[12] [Figures 1 and 2].

Subsequent testing confirmed the suspicion of Inflammatory Breast Carcinoma. A biopsy of the affected breast revealed invasive carcinoma cells. Additionally, HER2 protein was detected on the surface of the tumor cells, indicating the possibility of a more aggressive form of the disease but also providing a target for specific biological therapy.[9,10]

Given the aggressiveness of her disease, a comprehensive, multidisciplinary treatment plan was promptly initiated. This included neoadjuvant and adjuvant systemic chemotherapy, respectively an anthracycline (epirubicin) and a taxane (paclitaxel), and targeted biological therapy aimed at the HER2 protein.[13] Neoadjuvant therapy lasted two months, while the adjuvant one lasted six months.

The patient, having responded very well to neoadjuvant therapy with almost complete remission of the disease, had no complications at surgery. By international protocol, she has however undergone to the above-mentioned adjuvant therapy and the patient is currently in follow-up for 13 months, for a total period of 5 years.

All our patients are provided with psychological support by the Breast Unit team, in accordance with the multidisciplinary approach. The patient treated by us underwent only one psychological session, because it was not necessary to continue with further psychological investigation.

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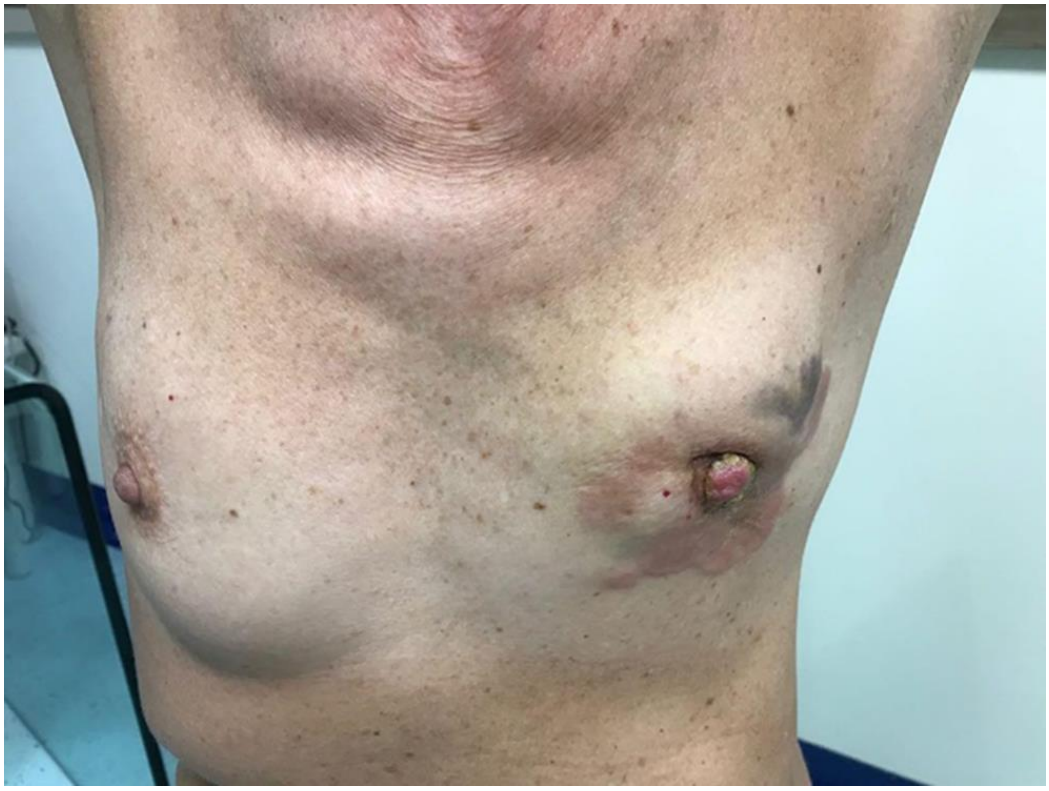

Figure 1. Clinical Presentation of the Patient's Breast (frontal view).

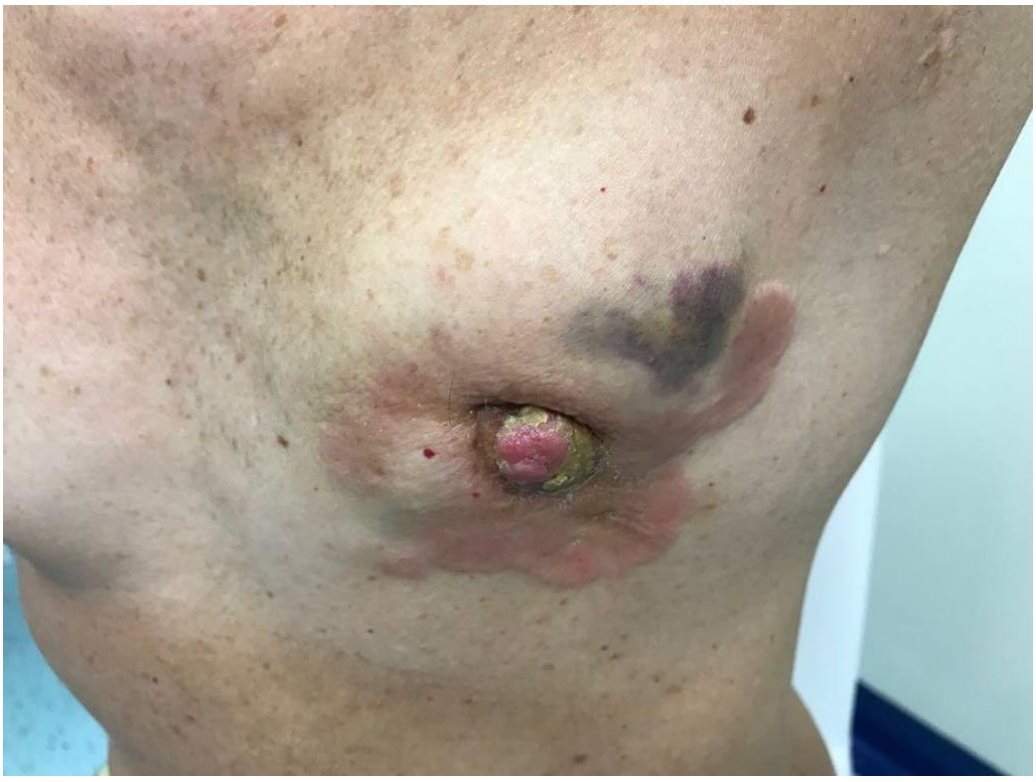

Figure 2. Clinical Presentation of the Patient's Breast (lateral view).

3. Results

An extraordinary aspect of this case is the exceptional response of the patient to the combination of systemic chemotherapy and targeted biological therapy against the HER2 protein. Over the past decade, HER2-targeted therapies have significantly improved the prognosis for patients with HER2-

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positive breast cancer. [15] This case provides another piece of evidence to support the efficacy of these therapies in managing aggressive forms of breast cancer, particularly when used in concert with systemic chemotherapy. The rapid and substantial improvement observed in the patient's symptoms and clinical signs underscores the potency of this therapeutic strategy.

Simultaneously, it is important to consider the patient's premenopausal status and existing hypertension. These additional factors could have potentially complicated the clinical picture and treatment approach.[16] However, through careful monitoring and management, these conditions did not negatively impact the therapeutic response, highlighting the crucial role of a multidisciplinary approach and personalized treatment planning in managing complex breast cancer cases.[17]

The case, therefore, enhances our understanding of IBC management, emphasizing the inherent difficulties associated with diagnosing and treating this aggressive breast cancer subtype. It also illustrates the potential for positive outcomes when comprehensive, personalized treatment strategies are put into practice.[18] With an increasing emphasis on precision medicine in

oncology, this case exemplifies the significant strides that can be made when treatments are tailored to individual patients and their specific disease characteristics.[19]

Furthermore, it is worth mentioning the patient's personal journey. Despite the aggressive nature of her disease, the patient showed remarkable resilience, displaying a positive attitude throughout her treatment. The importance of patient morale and psychological well-being should not be underestimated in any cancer treatment protocol.[20]

However, this case also underlines the necessity for further research. Despite the successful outcome in this case, IBC remains a challenging and aggressive disease, requiring more extensive studies to continue refining and improving treatment strategies.[21] This case represents a beacon of hope, demonstrating that even aggressive forms of breast cancer like IBC can be successfully managed using a combined systemic and targeted therapy approach. The challenges remain, and so does the resolve of the scientific and medical communities to overcome them.

The strength of this article lies in the fact that it is very well documented, describing the patient's clinical history point by point, allowing the reader a full understanding of the text, thus hoping that he will get the maximum benefit from this manuscript. However, remember the very nature of the article which, as a case report, has obvious limitations.

4. Discussion

The management of Inflammatory Breast Carcinoma (IBC) remains a significant challenge due to the disease's aggressive nature and rapid progression.[22] This case study has provided valuable insights into the diagnostic and therapeutic complexities of such a rare yet aggressive type of breast cancer. The patient's remarkable response to a combined regimen of systemic chemotherapy and HER2-targeted biological therapy highlights the promise of personalized, multidisciplinary treatment approaches.

This case has underscored the potential of HER2-targeted therapies in managing aggressive forms of breast cancer, especially when combined with systemic chemotherapy. Such therapies can significantly improve patients' outcomes, even in cases characterized by rapid disease progression and initial severity, as exemplified in this case.[10,15]

The necessity for an individualized and multidisciplinary approach has been reinforced, emphasizing the need for careful management of co-existing conditions, like hypertension in premenopausal women, to ensure optimal treatment outcomes.[18]

This case also advocates for the importance of patient resilience and psychological wellbeing during the treatment journey, reinforcing the role of supportive care in cancer management.[23] Finally, the successful management of this case, despite the numerous challenges presented, fuels the hope for improved treatment strategies in managing IBC and other aggressive forms of breast cancer. It reiterates the importance of ongoing research to continue refining these strategies, deepening our understanding of the disease, and improving patient outcomes.

Finally, it should be noted that Inflammatory carcinoma could be a presenting feature of other metastatic diseases. As H.N. Lakshmi, D. Saini, P. Om and N. Verma report in their article [24], a carcinosarcoma of the breast can present as an inflammatory carcinoma, just as other oncological diseases outside the breast tissue can mimic an IBC, as demonstrated by G. Panse, V. Bossuyt and C.J. Ko, in whose article they report a metastatic serous carcinoma presenting as inflammatory carcinoma over the breast.[25]

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