

Chemotherapeutic Extravasation of AC Protocol in a Patient with Infiltrative Ductal Carcinoma: Case Report

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Extravasamento Quimioterápico de Protocolo AC em Paciente com Carcinoma Ductal Infiltrante: Relato de Caso

Protocolo de Extravasación de AC con Quimioterapia en un Paciente con Carcinoma Ductal Infiltrante: Informe de Caso

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ABSTRACT

Introduction: Breast cancer has a high incidence in Brazil and is among the leading causes of cancer-related death in women, with invasive ductal carcinoma being the most frequent histological subtype. Among systemic regimens for HER2-negative tumors, the AC protocol is widely used, although it may lead to serious adverse events such as extravasation of anthracyclines into adjacent tissues. Given the potential for tissue necrosis and prolongation of oncologic treatment, a case of chemotherapy extravasation involving the AC protocol and its local management with polyhexamethylene biguanide (PHMB) is reported. **Case report:** A 72-year-old female patient with invasive ductal breast carcinoma, pT2pN1a, luminal B subtype and HER2 negative, undergoing chemotherapy with the AC protocol. At the end of doxorubicin infusion through a peripheral venous access on the dorsum of the left hand, she reported a burning sensation at the site, and edema and absence of blood reflux were identified, which led to immediate interruption of the infusion and implementation of an institutional protocol with aspiration of residual content, cold compresses and topical dexamethasone ointment for 96 hours. During follow-up, the lesion worsened, with dry necrosis and hyperemia, and dressings with PHMB, hydrogel and silver-containing hydrofiber were introduced until complete healing after prolonged outpatient follow-up. **Conclusion:** This case reinforces the severity of anthracycline extravasation and the need for early recognition, well-defined care protocols and health education to promote adherence to home care instructions. It also highlights the role of the nursing team and the use of specific dressings, including PHMB, in ensuring the safety and effectiveness of care for oncology patients undergoing intravenous chemotherapy.

Key words: Extravasation of Therapeutic and Diagnostic Materials/complications; Antineoplastic agents/adverse effects; Breast Neoplasms/complications.

RESUMO

Introdução: O câncer de mama apresenta alta incidência no Brasil e figura entre as principais causas de morte por neoplasia na população feminina, sendo o carcinoma ductal infiltrante o subtipo histológico mais frequente. Entre os esquemas sistêmicos para tumores HER2-negativos, o protocolo AC é amplamente utilizado, embora possa ocasionar eventos adversos graves, como o extravasamento de antraciclina para os tecidos adjacentes. Diante do potencial de necrose tecidual e prolongamento do tratamento oncológico, relata-se um caso de extravasamento quimioterápico do protocolo AC e manejo local com poli-hexametileno biguanida (PHMB). **Relato do caso:** Paciente feminino, 72 anos, com carcinoma ductal infiltrante de mama, pT2pN1a, subtipo luminal B e HER2-negativo, em quimioterapia com protocolo AC. Ao final da infusão de doxorubicina por acesso venoso periférico no dorso da mão esquerda, reportou sensação de queimação no local, sendo identificados edema e ausência de refluxo, o que levou à interrupção imediata da infusão e implementação de protocolo institucional com aspiração de conteúdo residual, compressa fria e pomada de dexametasona por 96 horas. Na evolução, houve piora da lesão, com necrose seca e hiperemia, sendo instituídos curativos com PHMB, hidrogel e hidrofibra com prata, até a cicatrização completa após seguimento ambulatorial prolongado. **Conclusão:** O caso reforça a gravidade do extravasamento de antraciclina e necessidade de reconhecimento precoce, protocolos assistenciais bem definidos e educação em saúde para adesão às orientações domiciliares. Evidencia ainda o papel da equipe de enfermagem e uso de coberturas específicas, incluindo PHMB, na segurança e eficácia do cuidado em pacientes oncológicos submetidos à quimioterapia intravenosa.

Palavras-chave: Extravasamento de Materiais Terapêuticos e Diagnósticos/complicações; Antineoplásicos/efeitos adversos; Neoplasias da Mama/complicações.

RESUMEN

Introducción: El cáncer de mama presenta una alta incidencia en el Brasil y se encuentra entre las principales causas de muerte por neoplasia en la población femenina, siendo el carcinoma ductal infiltrante el subtipo histológico más frecuente. Entre los esquemas sistémicos para tumores HER2 negativos, el protocolo AC se utiliza ampliamente, aunque puede ocasionar eventos adversos graves, como la extravasación de antraciclina hacia los tejidos adyacentes. Ante el potencial de necrosis tisular y el prolongamiento del tratamiento oncológico, se presenta un caso de extravasación de quimioterápico del protocolo AC y el manejo local con polihexametileno biguanida (PHMB). **Informe del caso:** Paciente femenino de 72 años, con carcinoma ductal infiltrante de mama, pT2pN1a, subtipo luminal B y HER2 negativo, en quimioterapia con el protocolo AC. Al final de la infusión de doxorubicina por acceso venoso periférico en el dorso de la mano izquierda, refirió sensación de ardor en el sitio, identificándose edema y ausencia de reflujo, lo que llevó a la interrupción inmediata de la infusión y a la implementación de un protocolo institucional con aspiración del contenido residual, compresa fría y pomada de dexametasona durante 96 horas. En la evolución, se observó empeoramiento de la lesión, con necrosis seca e hiperemia, instaurándose curaciones con PHMB, hidrogel e hidrofibra con plata, hasta la cicatrización completa tras un seguimiento ambulatorio prolongado. **Conclusión:** El caso refuerza la gravedad de la extravasación de antraciclina y la necesidad de reconocimiento temprano, protocolos asistenciales bien definidos y educación en salud para favorecer la adhesión a las orientaciones domiciliarias. Asimismo, evidencia el papel del equipo de enfermería y el uso de coberturas específicas, incluida la PHMB, en la seguridad y eficacia del cuidado de pacientes oncológicos sometidos a quimioterapia intravenosa.

Palabras clave: Extravasación de Materiales Terapêuticos y Diagnósticos/complicaciones; Antineoplásicos/efectos adversos; Neoplasias de la Mama/complicaciones.

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INTRODUCTION

Breast cancer is epidemiologically relevant in Brazil and is among the most incident neoplasms in the female population^{1,2}. Infiltrative ductal carcinoma, one of the invasive types, is the most frequent histological type^{3,4}. Protocol AC (doxorubicin and cyclophosphamide) remains as the widely utilized regimen⁵.

Despite its therapeutic effectiveness, intravenous administration of antineoplastics can cause severe adverse events. Extravasation is characterized by accidental leakage of medication to adjacent tissues which can trigger pain, inflammation, ulceration and necrosis, especially if vesicant drugs such as doxorubicin are involved⁶⁻⁸. In these conditions, early detection, immediate discontinuation of the infusion and adoption of specific measures are critical to restrain the extension of the tissue damage^{6,7}.

Further to the initial management, the evolution of the lesion requires strict monitoring and proper choice of dressings and topic solutions. The poly-hexamethylene biguanide stands out as an antimicrobial agent to control the biofilm and wounds cleaning and can contribute to prevent local infection and progression of the wound healing^{8,9}. In light of this picture, the present report describes the evolution of a lesion caused by the extravasation of doxorubicin in a patient with invasive breast ductal carcinoma with emphasis in the clinical management and local care adopted.

The Ethics Committee of “*Universidade Federal de Sergipe (UFS)*” approved the study, report number 7985349 (CAAE (submission for ethical review): 89466925.2.0000.0217) in compliance with Directive 466/2012¹⁰ of the National Health Council (CNS).

CASE REPORT

72-year old female patient diagnosed with invasive breast ductal carcinoma, pT2pN1a, subtype luminal B and HER2-negative, in chemotherapy with protocol AC. During the first cycle, in the end of the infusion of doxorubicin through peripheral venous access in the dorsum of the left hand, the patient reported local burning sensation. The evaluation detected edema and absence of adequate reflux, raising suspicion of extravasation (Figure 1).

In light of the event, the infusion was interrupted with aspiration of the residual content, removal of the venous access, application of cold compress for 30 minutes and topic use of dexamethasone ointment. The patient was guided to keep the cold compress associated with the ointment four times a day for 96 hours, further to local surveillance for aggravation symptoms.



Figure 1. Site of the lesion after seven days

At the follow up visit, the lesion has worsened with central dry necrosis, hyperemia and sloughy areas, being applied poly-hexamethylene biguanide dressing, hydrogel and secondary cover. After 21 days, the patient returned for a new chemotherapy cycle with the lesion still open and presence of devitalized tissue. She reported she failed to follow strictly the guidelines to apply the ointment and having exposed the hand to sun rays, factors possibly related to the clinical worsening. The guidelines were reinforced and recommended frequent monitoring to change dressings.

After 60 days of evolution, the lesion kept central dry necrosis and perilesional hyperemia, continuing in treatment with poly-hexamethylene biguanide, hydrogel and gauze. Later, the lesion aggravated with signs of infection and purulent secretion, prompting the replacement with silver hydrofiber dressing (Figure 2).

Due to complications, an oncologist suspended the last cycle of chemotherapy, initiated hormone therapy and radiotherapy and requested a magnetic resonance imaging of the limb affected. After 230 days of follow-up, the lesion was fully healed with absence of inflammatory signs, preserved mobility and satisfactory functional recovery (Figure 3).

DISCUSSION

The extravasation of doxorubicin is an oncologic emergency because the anthracyclines have high vesicant



Figure 2. Site of the lesion after 85 days



Figure 3. Site of the lesion after 230 days

potential and can produce deep lesions and progressive ulceration⁶⁻⁸. The persistence of the medication in the interstice and its sustained cytotoxic effect explain the possibility of late aggravation of the lesion, even after initial conducts are implemented^{7,8}. Therefore, the immediate interruption of the infusion, aspiration of residual content, not discharging the infusion pump set and implementation of specific measures are essential steps of the management⁶⁻⁸.

The unfavorable initial evolution was compatible with the severity of the extravasation by doxorubicin and possibly aggravated due to poor adherence to household guidelines. This aspect reinforces that care is not limited to the immediate institutional protocol, but includes consistent health education, strict monitoring and active participation of the patient and family. The nursing team plays a key role in this process, both in early identification or continuation of the outpatient follow up^{6,7}.

Local treatment included the application of poly-hexamethylene biguanide as part of the care of the wound associated with hydrogel, gauze and later, silver hydrofiber. The action of the nursing team is consistent with the necessity to control the microbial load and of biofilm in lesions with loss of bone integrity, especially because of the risk of colonization and infection^{8,9}. Although it is not possible to include healing exclusively associated with the use of this agent, the final evolution suggests its applicability as adjuvant in a comprehensive, individualized and continuously reevaluated therapeutic plan^{8,9}.

CONCLUSION

The report showed that the extravasation of doxorubicin can cause extensive lesion, prolong the oncologic treatment, in addition to demanding lengthy specialized

monitoring. It has also demonstrated the relevance of early recognition, strict application of care protocols and education of the patient to adhere to household measures.

In addition, the use of proper dressings and poly-hexamethylene biguanide (PHMB) was part of the local management of the wound along the clinical evolution. Furthermore, the case strengthens the strategic role of the multiprofessional team, especially the nurses, in ensuring safety and avoiding the evolution to more severe conditions.

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CONTRIBUTIONS

Simone Yuri Kameo, Sabrina Barreto Mota, Anne Grasyelle Magalhães Melo and Ivangela Raphaela Gouveia Prudente contributed substantially to the study conception and design, acquisition, analysis and interpretation of the data, writing and critical review. Shayane da Mota Teixeira, Pedro Henrique da Silva Rodrigues and Elisangela Santos Silva contributed substantially to the writing and critical review. All the authors approved the final version for publication.

DECLARATION OF CONFLICT OF INTEREST

There is no conflict of interest to declare.

DATA AVAILABILITY STATEMENT

All the content underlying the text is contained in the manuscript.

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