

Photobiomodulation therapy in the post-operative management of puerperal mastitis-associated breast abscess

Terapia de fotobiomodulação no manejo pós-operatório de abscesso mamário associado à mastite puerperal

Terapia de biofotomodulación para el control pos-operatorio de absceso mamario asociado a mastitis puerperal

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Abstract

Although phototherapies have been used to manage nipple lesions and pain in breastfeeding women, there is no information on alternative therapies treating puerperal mastitis-associated breast abscess. The current study aimed to present a case in which adjuvant photobiomodulation therapy was used for a breast abscess developed as a complication of puerperal mastitis. Despite receiving antibiotic therapy, exudate drainage, surgical cleaning, and drain placement, after 11 days, the patient was still experiencing pain and there were marked inflammation signs on the region. Fifteen sessions of photobiomodulation therapy were then proposed. Pain relief was achieved after 3 laser sessions and wound healing after 15 laser sessions. According to the current case, photobiomodulation therapy seems to be a valuable adjuvant therapeutic modality for puerperal mastitis-associated breast abscess.

Keywords: Low-level light therapy; Mastitis; Breast.

Resumo

Embora as fototerapias tenham sido utilizadas para o manejo de lesões mamilares e analgesia em mulheres que amamentam, não há informações sobre terapias alternativas para o manejo de abscesso mamário associado a mastite puerperal. O presente estudo teve como objetivo apresentar um caso em que a terapia de fotobiomodulação foi proposta como terapia coadjuvante no manejo de um abscesso mamário associado à mastite puerperal. Apesar de ter recebido antibioticoterapia, drenagem de exsudato, limpeza cirúrgica e colocação de dreno, após 11 dias a paciente ainda apresentava dor e a inflamação na região persistia. Foram então propostas quinze sessões de terapia de fotobiomodulação. A completa analgesia foi referida após 3 sessões de laser e, após 15 sessões, o reparo completo da lesão foi observado. De acordo com o presente caso, a terapia de fotobiomodulação parece ser uma valiosa modalidade terapêutica adjuvante para o manejo do abscesso mamário associado à mastite puerperal.

Palavras-chave: Terapia com luz de baixa intensidade; Mastite; Mama.

Resumen

A pesar de que las fototerapias han sido utilizadas para controlar lesiones mamilares y como analgésicos en mujeres que amamantan, no hay información sobre terapias alternativas para el control de abscesos mamarios asociados a mastitis puerperal. El presente estudio tuvo como objetivo presentar un caso en que la terapia de biofotomodulación fue propuesta como terapia adyuvante en el control de un absceso mamario asociado a mastitis puerperal. A pesar de que la paciente recibió fototerapia, terapia antibiótica, drenaje del exudado, limpieza quirúrgica y colocación de un drenaje, después de 11 días, todavía presentaba dolor y tenía señales inflamatorias acentuadas en la región. Entonces fueron propuestas quince sesiones de terapia de biofotomodulación. Una analgesia completa fue relatada después de 3 sesiones de laser y, después de 15 sesiones, el reparo completo de la lesión fue observado. De acuerdo con el presente caso, la terapia de fotobiomodulación parece ser una valiosa modalidad terapéutica adyuvante para el control del absceso mamario asociado a una mastitis puerperal.

Palabras clave: Terapia por luz de baja intensidad; Mastitis; Mama.

1. Introduction

Most breast abscesses develop as a complication of lactational mastitis. They are considered a serious concern because of the discontinuation of breastfeeding, which may compromise infant nutrition. Although the incidence in lactating women varies widely, rates as high as 33% have been reported (Kataria et al., 2013; Pevzner & Dahan, 2020; Spencer, 2008).

The conventional treatment for breast abscesses involves either surgical incision and drainage or needle aspiration and antibiotic therapy (Martin, 2009). Although phototherapies are suitable to manage traumatic nipple lesions and to relieve nipple pain in breastfeeding women (Chaves et al., 2012; Coca et al., 2016), there is no information on alternative therapies for breast abscess.

The rationale for using phototherapies in these cases would be based on their effectiveness in stimulating wound healing (Hamblin, 2017), pain relief, and reducing inflammation processes (Chaves et al., 2012). Thus, the current paper aims to report a case in which a patient received photobiomodulation therapy (PBMT) after surgical and drug treatment for mastitis-associated breast abscess.

2. Case Report

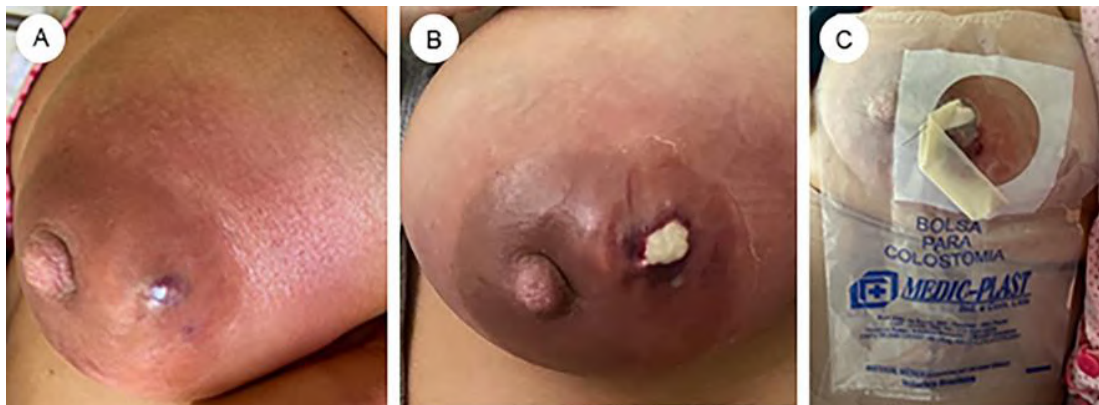
A 30-year-old woman, with no systemic disease, delivered her first baby by cesarean section. The baby was healthy and there was no complication related to him after birth. However, on the 7th day, the patient attended a medical appointment complaining of a total absence of milk flow from the left breast. After physical examination, it was noted no colostrum discharge but no other signs or symptoms were present. Breastfeeding was thus suspended since the diagnosis of galactocele, which required the use of cabergoline. Therapeutic breast massages were also recommended.

Two days later, the patient sought medical help due to swelling affecting her left breast, which has become red, firm, and larger. Antibiotic therapy was then administered (oral amoxicillin 500mg, three times daily), besides an analgesic and a non-steroidal anti-inflammatory.

After 15 days from the cesarean section, with no improvement in the patient's clinical condition, she was admitted to our Hospital. Antibiotic therapy with intravenous oxacillin (500mg, every 6h) was further administered, with no success. Ultrasound examination revealed a fluid collection into the affected breast and laboratory findings indicated acute infection.

Three days later, periareolar incision, exudate drainage, surgical cleaning, and drain placement were performed under general intravenous anesthesia (Figure 1). Postoperative antibiotic therapy was not modified, and a weak opioid was used eventually. Given the proper infection control and no other complaints or complications, the drain was removed within 3 days and the patient was released to home after 11 days of hospitalization.

Figure 1. Initial clinical evaluation. (A) Initial aspect - breast edema, showing a red, firm, and larger area; (B) Brest presenting secretion discharge; (C) Drain placement.

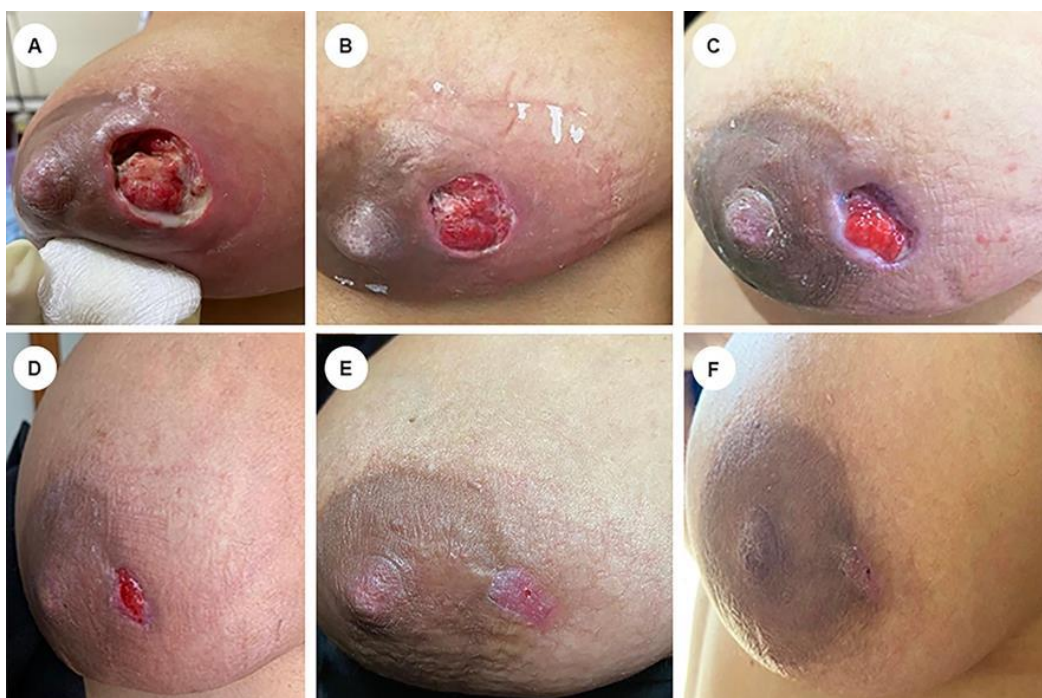


Source: Authors.

On the next day, the patient attended a medical appointment still in pain (grade 6 according to a visual analog scale). Then, PBMT was proposed as adjuvant therapy. For that, the affected site was irradiated at 808-nm, 120mW, 3J per point, totaling 8 points, over infra, lateral, and supra-nipple regions. Further central point and 4 others around the wound were illuminated using 660-nm, 100mW, 0.5J, and 5s per point (Ecco Fibras®, Campinas, SP, Brazil). The patient received a total of 15 laser sessions, 3 times a week.

Within the first 48 hours of treatment, improvement in tissue healing could be noted; furthermore, after the third session, the patient no longer reported pain. In the 7th session, tissue repair was at an advanced stage; however, wound healing was observed in the 15th session (Figure 2).

Figure 2. Postoperative evaluation. (A) Clinical aspect after hospital discharge, showing edema and a large ulcerated area with erythematous halo; (B) 24 hours after the first laser session; (C) Third laser session; (D) Seventh laser session; (E) Thirteenth laser session; (F) Fifteenth laser session, showing wound healing.



Source: Authors.

3. Discussion

In most cases of mastitis-associated breast abscess, although a good recovery is expected, women usually experience pain, interrupt breastfeeding, and present scars, recurrent infections, and poor quality of life, since the usual drug treatment takes place for a long period (Blackmon et al., 2021). To the best of the authors' knowledge, however, no previous study has proposed PBMT as adjuvant therapy.

PBMT is based on non-ionizing light sources near the visible or infrared spectrum and has proven to be effective in stimulating wound healing (Hamblin, 2017), promoting pain relief and reducing inflammation processes thanks to biomodulation local effects (Soares et al., 2021), in addition to reducing oxidative stress through the systemic effects (Chaves et al., 2012). The production of adenosine triphosphate is also promoted following photon absorption, consequently accelerating mitotic activity by microcirculation and neovascularization stimulation (Pruitt et al., 2022).

The analgesic effects of PBMT, evident in the current case, may also be related to light absorption by nociceptors that inhibit neural fibers and slow the transmission of pain information by blocking axonal flow by suppressing neurogenic information (Yan et al., 2011). Furthermore, PBMT sessions are non-invasive, cheap, and the technique does not present side effects (Berlingieri et al., 2022; De Oliveira et al., 2021; Tateno et al., 2020; Teixeira et al., 2021).

4. Final Considerations

According to the current case, PBMT seems to be a valuable adjuvant therapeutic modality for puerperal mastitis-associated breast abscess; however, more research is needed to better evaluate laser parameters and clinical benefits.

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