CASE REPORT
https://doi.org/10.29289/2594539420220045

Erysipelas after surgery for breast cancer: a real-world cohort

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ABSTRACT

Erysipelas is often related to lymphedema, which can occur in up to 60% of cases, with advanced age, radiotherapy, tumor extension, surgical approach, and infections as risk factors. The aim of this study was to present and discuss a series of cases of erysipelas after breast cancer surgery treated in a private mastology clinic over the past ten years. This is a retrospective horizontal cohort study in which we selected all cases of erysipelas after breast cancer surgery from 2009 to 2019. The following were evaluated: number of patients treated with a diagnosis of breast carcinoma with axillary approach, age, surgery performed, adjuvant treatment and treatment of erysipelas, presence of lymphedema, and measurement of circumferences between both arms and associated diseases. A total of 12 cases of breast cancer were treated. In 66.66% of cases, a radical axillary lymphadenectomy was performed, and in 16.66% of cases, only a sentinel lymph node investigation was performed. The average age was 67.6 years. Erysipelas appeared, on average, 43 months after cancer diagnosis. Two deaths were reported due to severe erysipelas leading to sepsis. More studies are still needed on the subject. Of the 12 cases in this study, eight (66.66%) were associated with lymphedema. Only two (16.66%) of the patients in this group who developed erysipelas were not submitted to axillary dissection. The treatment for 50% of the participants in this research was with penicillin G benzathine. There were three relapses, and two patients died during the research period.

KEYWORDS: erysipelas; breast cancer; surgery.

INTRODUCTION

Erysipelas is an infectious cellulitis, which compromises the epithelial tissue with involvement of lymphatic vessels, mainly caused by group A beta hemolytic streptococci, rarely group C streptococcus and *S. aureus*[1,2]. In cancer patients who undergo breast and armpit surgery, this type of dermatitis is a significant postoperative complication, due to the impairment of the lymphatic microcirculation in the affected region[3].

This infection is often related to lymphedema, which can happen in up to 60% of cases, with advanced age, radiotherapy, tumor extension, surgical approach, and infections as risk factors[4,5].

Age and radiotherapy are risk factors for lymphedema as they cause fibrosis of the lymphatic vessels. The size of the tumor and the surgical trauma injure the lymphatic vessels and axillary lymph nodes, altering the lymphatic drainage of the upper limb and ipsilateral breast and, consequently, the patient's immune system. This becomes an essential vicious circle for the pathogenesis of erysipelas, as well as its recurrence[6,7].

Erysipelas is both a causal factor and a consequence of lymphedema, considering that the exudate from the infection can cause obstruction of the lymphatic vessels, as well as the imbalance of lymphatic drainage can lead to impaired immunity[8,9].

Currently, research performing a sentinel lymph node instead of an axillary lymphadenectomy in the treatment of breast cancer decreases the incidence of lymphedema and, consequently, the occurrence of erysipelas[2]. A series of cases of erysipelas after surgery for breast cancer treated at a private mastology clinic in the past 10 years is presented.

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Conflict of interests: nothing to declare. **Funding:** none.
Received on: 10/22/2022. **Accepted on:** 02/23/2023.

CASE REPORT

This is a series of cases in a retrospective horizontal cohort format carried out in a private mastology clinic.

During the study period, approximately 1,200 cases of breast cancer were treated at the clinic, of which 12 cases evolved with a subsequent diagnosis of erysipelas on the ipsilateral upper limb. In 66.66% of cases, radical axillary lymphadenectomy was performed, and in 16.66% of cases, only sentinel lymph node research was performed.

The age of patients ranged from 38 to 82 years, with a mean age of 67.6 years. One case occurred in males (Figure 1). All patients underwent surgery for breast carcinoma, with eight (66.6%) cases of surgery with axillary dissection. Of note, 10 (81.8%) and 11 (90.9%) underwent chemotherapy and radiotherapy, respectively (Table 1).

In 50% of these patients, both arms were measured, and the difference between them ranged from 3 to 6.5 cm.

Erysipelas appeared, on average, 43 months after cancer diagnosis. The mean number of episodes was 1.75 per patient, with recurrence in three cases. Lymphedema was clinically present in eight (66.6%) of the patients, and the other reported symptoms were erythema, edema, heat, and pain, accompanied by fever, chills, general malaise, nausea, or vomiting. Two deaths were recorded due to severe erysipelas leading to sepsis. One patient sought the emergency department twice with a clinical picture of erysipelas, being medicated only with symptomatic drugs and analgesic, and when she returned for the third time, she was already in septic shock, being admitted to the intensive care unit, but evolving with multiple organ and system failure and death. The other patient had symptoms of erysipelas for several days at home, and when she sought the medical service, she was in septic shock, which led to her death.

DISCUSSION

In the present study, most patients with erysipelas had a history of axillary dissection. Of the patients who presented erysipelas, 66.6% had lymphedema and 75% had other associated diseases.

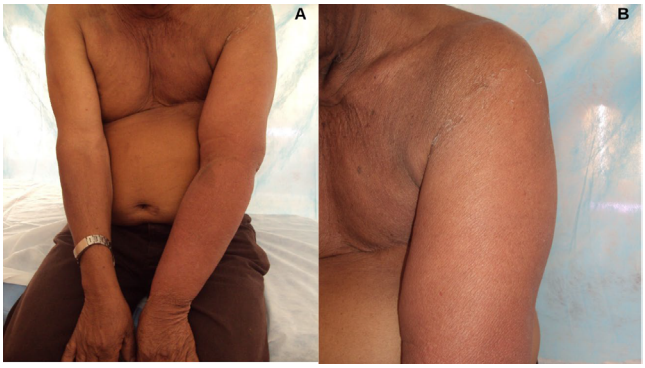


Figure 1. Male patient in the study. Six years after surgery, there were seven episodes of erysipelas in the left upper limb (A and B).

The clinical picture of erysipelas is characterized by erythema, edema, heat, and pain, accompanied by fever, chills, general malaise, nausea, or vomiting[1]. And the main risk factors are advanced age, surgeries, lymphedema, neoplasms, and chemotherapy.

These risk factors generate leukopenia and compromise cellular immunity, impairing chemotaxis and phagocytosis of polymorphonuclear cells, which facilitates the prevalence of skin infections. In addition to lymphedema, advanced age, radical mastectomy, chemotherapy, and radiotherapy are also risk factors, as observed in the present study[10].

In the results, the average age affected by post-mastectomy erysipelas is 67.6 years, which is in line with studies that claim a higher prevalence of infection from the fifth decade of life. The relationship with advanced age can be explained, as physiologically, from the age of 40 years, and there is fibrosis of the blood vessels, which generates imbalance in the lymphatic and immune systems, leading to exudate accumulation and bacterial proliferation[6,8].

It is noted that 90% of patients underwent complementary treatment with chemotherapy or radiotherapy, which are risk factors for erysipelas. Thus, it is important to instruct patients to detect early signs of redness, swelling, or pain in the upper limbs after regional therapies, in order for oral or parenteral therapy to be effective[2].

The main risk factor for erysipelas in patients who have undergone treatment is the occurrence of lymphedema, with the standardization of the sentinel lymph node technique for most patients with breast cancer. In the current scenario, the rate of lymphedema has greatly decreased, with a meta-analysis showing an incidence of only 6.3% compared to 22.3% after radical axillary lymphadenectomy[11,12].

Another technique that reduces the risk of lymphedema is the reverse search of the sentinel lymph node; however, this technique is not routinely used[13].

In patients with lymphedema, microsurgery and omentum lymph node transplantation have been used with encouraging results, but these procedures are performed by few surgeons and are therefore not widely available[14,15].

Post-mastectomy physiotherapy is essential, since the association of various therapies, such as manual lymphatic drainage, compressive bandaging, the use of bandages, complex decongestive physiotherapy, among others, results in an improvement in lymphedema or prophylaxis of this, by maintaining adequate lymphatic circulation, in addition to preventing relapses[6,7].

The recommended treatment for erysipelas is empirical antibiotic therapy, with intramuscular benzathine penicillin G being the reference antibiotic, but oral antibiotics such as amoxicillin or erythromycin can also be used[1]. In the present study, drugs of the cephalosporin class and benzathine penicillin G were used in three and six patients, respectively.

In our series, three patients had recurrence. One of the patients had seven cases of erysipelas; the last four episodes

Table 1. Erysipelas series after lymph node emptying.

Age (years)	Gender	Comorbidities	Appearance after cancer diagnosis	Staging	Surgery	Chemotherapy	Radiotherapy	Lymphedema	Number of episodes	Treatment	Follow-up time after erysipelas	Outcome
72	F	DM SAH	2 years	IIA	Mastectomy + axillary dissection + sentinel lymph node	✓	✓		1	Cephalexin and ciprofloxacin	7 years	No disease
64	F	SLE SAH	5 years		Mastectomy + sentinel lymph node	✓	✓		1	Cefadroxil	7 years	No disease
71	F	SAH	10 years		Mastectomy + axillary dissection + sentinel lymph node	✓	✓	✓	1	?	14 days	
66	F	Dyslipidemia	5 years		Centralectomy + axillary dissection + sentinela lymph node	✓	✓	✓	1	Penicillin G benzathine	1 year and 3 months	
75	M	SAH	6 years		Mastectomy + axillary dissection		✓	✓	7	Penicillin G benzathine	7 years	No disease
74	F		2 years	IIB	Mastectomy + axillary dissection + sentinel lymph node	✓	✓	✓	2	Penicillin G benzathine 2 doses	10 months	Death
79	F	SAH	1 year	IIA	Mastectomy + axillary dissection	✓	✓	✓	1	?	?	
40	F		1 year	IIIB	Segmental resection + axillary dissection + sentinel lymph node	✓	✓	✓	1	Penicillin G benzathine	1 year	
73	F		4 years		?				1	Penicillin G benzathine	1 year	
38	F	DM	4 years		Mastectomy + sentinel lymph node	✓	✓	✓	1	Penicillin G benzathine 1x/m/year	5 years	
82	F	SAH	3 years		Mastectomy	✓	✓	✓	2	Cefaclor	8 years	No disease
78	F	SAH	1 year	IIIA	Segmental resection + axillary dissection				1	?	?	Death

DM: Diabetes mellitus; SAH: Systemic arterial hypertension; SLE: Systemic lupus erythematosus.

were reported in the research time frame and were treated with penicillin G benzathine. Another patient used cefaclor in case of recurrence, thus not presenting erysipelas later. Finally, the third case of recurrent erysipelas in the study had been treated with penicillin G benzathine in the first episode, and after 10 months, he was hospitalized with severe erysipelas that progressed to sepsis and death.

According to the literature, only about 5% of blood cultures in the case of erysipelas are usually positive. Because bacteremia is rare in this type of infection, diagnosis and treatment are immediate without the need to wait for laboratory test results. Cultures can also be performed using needle aspiration, but the availability of this type of test is not the same in all health services, and its sensitivity is also low[1,16]. In none of the cases in the study was a culture performed to identify the infectious agent causing erysipelas.

However, when easily available, performing the culture should be prioritized, since there may be complications due to the ineffectiveness of treatment for infectious agents considered rarer. For this, two samples are punctured and collected from the site of infection and analyzed in the laboratory in order to isolate the causative agent, but the result takes at least 72 h.

Finally, erysipelas can cause death, as reported here. Physicians in the family health program and those working in emergency departments must be aware of this disease so that therapy with benzathine penicillin can be instituted as soon

as possible, determining control of the infection and avoiding unnecessary deaths.

The limitations of our study are the small number of cases, the lack of objective measurement of the presence of lymphedema, using only the difference in the measurements of the circumference between the arms, and the failure to perform a culture to identify the etiological agent in any of the cases.

CONCLUSIONS

Of the 12 cases of post-mastectomy erysipelas reported in this study, 8 (66.66%) were associated with lymphedema. Only two (16.66%) of the patients in this group who developed erysipelas did not undergo axillary dissection. The treatment for 50% of the participants in this research was done with penicillin G benzathine, of whom three had relapses and two patients died during the research period.

AUTHORS' CONTRIBUTIONS

SVSR: Formal Analysis, Investigation, Writing – original draft.
AVLM: Formal Analysis, Investigation, Writing – original draft.
DRSF: Formal Analysis, Investigation, Writing – original draft.
RSN: Data curation, Formal Analysis,Writing – review & editing.
SCV: Conceptualization, Data curation, Methodology, Resources, Writing – review & editing

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