

CASE REPORT

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Bullous arthropod bite reaction

Bhargav B Koyani, Rajvi D Pathak, Dhrumi H Thacker

ABSTRACT

A case of bullous arthropod bite reaction occurs following the bite of an arthropod, resulting in edema and eruption of blisters on the affected area, as it is a challenging task to differentiate it from cellulitis, especially in the early course of the reaction. So, early diagnosis is required to prevent the unnecessary use of antibiotics and no delay in managing arthropod bite reaction. The natural history of the disease begins with marked edema with erythema at the bite and surrounding sites. It is followed by single/multiple bulla formation depending upon the number of bites. Then it ruptures, and a serous fluid is released, which is then followed by the formation of granulation tissue a week or two later. Appropriate wound care with soap and water is required to prevent superimposed bacterial infection. Differential diagnoses of cellulitis and necrotizing fasciitis can be excluded by lack of systemic signs and symptoms like fever, malaise, or weakness. Treatment generally involves symptomatic relief of pain and pruritus, including nonsteroidal anti-inflammatory drugs (NSAIDs) and antihistaminic.

Keywords: Antibiotic use, Arthropod bite, Bullous reaction, Cellulitis, Necrotizing fasciitis

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INTRODUCTION

Why is it important to distinguish between cellulitis [1] and cellulitis-like reaction? One of which is bullous arthropod bite reaction. The development of antibiotic resistance is an emerging concern for modern medicine. The Centers for Disease Control and Prevention (CDC) has classified several bacteria as presenting urgent, serious, and concerning threats, which is why differentiating cellulitis from bullous arthropod bite is necessary for not only prompt treatment plan but to prevent unnecessary use of antibiotics too. In this case report, we have discussed the symptoms and signs of bullous arthropod bite reaction and how to differentiate it from cellulitis and necrotizing fasciitis [2].

CASE REPORT

The patient is a 23-year-old male. He presented with the complaint of edema and erythema in the left leg. The course of the disease in the patient is as follows:

Day 1: The patient developed swelling in the left lower leg near the ankle during the evening. There was a pinpoint bite mark surrounded by light erythema and marked swelling near the ankle, which can be given in Figure 1. The patient was unaware of any insect bite.



Figure 1: Day 1; swelling in the left lower leg with pinpoint bite mark surrounded by light erythema.

Day 2: After 24 hours, swelling and erythema increased. While walking or hanging the foot down, edema and erythema got exacerbated. Eventually, pruritus developed. However, there was no fever, malaise, or other systemic manifestations. Swelling increased as the day progressed, and tenderness developed. He had difficulty walking due to pain, and induration was present around the ankle. Over a few hours, a single bullous lesion formed over the affected area, which can be seen in Figure 2. It was tense and was filled with watery fluid.



Figure 2: Day 2; swelling with watery fluid at the bite site with increased erythema than previous day.

Day 3: Bulla enlarged and became tenser, as can be presented in Figure 3. Then it was ruptured with a sterile needle. There was continuous serous discharge from the lesion over the next day, which can be seen in Figure 4.



Figure 3: Day 3; tenser and enlarge bullae with watery fluid.



Figure 4: Day 4; after rupturing bullae with sterile needle continuous discharge of watery fluid.

Drug history

Initially, due to pain on the first day, the patient self-medicated with ibuprofen which slightly improved the pain but could not relieve the edema.

The next day as the erythema developed, intravenous (IV) cefuroxime-sulbactam was initiated along with linezolid due to concern of cellulitis due to methicillin-resistant *Staphylococcus aureus* (MRSA) infection. Intravenous antibiotic was continued for one day only. Then, it was replaced with oral cefuroxime and linezolid for five days. The patient also started taking levocetirizine for symptomatic relief of itching.

Laboratory work up

1. CBC ordered to check for leukocytosis due to infection, and it was normal.
2. Random blood sugar: It was normal.
3. Creatinine: normal.
4. CRP: It was elevated due to ongoing inflammation.

Differential diagnosis

Cellulitis: Initially, since there was marked erythema and induration was present, cellulitis was suspected.

But when a single bullous lesion appeared at the insect bite site, cellulitis was unlikely. Erythema is less severe in bullous reaction to arthropod bite as compared to cellulitis. Unlike cellulitis, edema is more pronounced on walking and hanging the foot down.

Necrotizing fasciitis: There were no signs and symptoms of systemic signs like fever or malaise. And disease progression was not very aggressive. Though multiple hemorrhagic bullae appear in the necrotizing fasciitis, single bullae filled with serous fluid at the insect bite site is unlikely for that.

DISCUSSION

Bullous arthropod reaction is very common [3]. Arthropod bite releases the toxin at the bite site causing local tissue damage. It is followed by inflammation and edema at the site of the lesion. Insect bites produce an inflammatory or allergic reaction with variable response. Reactions can vary from no reaction to pruritic papules, vesicles, or bullae. There is an increased risk of superimposed bacterial infection, so appropriate wound care is necessary with regular washing using soap and water. Most of the time, the patient cannot feel an insect bite. The patient becomes aware only when erythema and pain develop at the site. Due to the large variety of arthropods, identifying the species is very difficult and does not change the management strategy. Further, every individual has a varying reaction to different arthropod bites.

A typical course of the disease

Day 1: edema and slight erythema, Day 2: edema and erythema increase, and a single small bulla starts to form. Day 3: single large bulla forms, Day 4: bulla might rupture, and serous fluid oozes continuously. Day 5: granulation tissue formation (Figure 5), Days 6 to 10: formation of normal skin without scar (Figure 6).



Figure 5: Day 5; formation of granulation tissue [5].



Figure 6: Picture of healed skin with visible scar tissue.

Management

Initially, if cellulitis cannot be ruled out, IV or oral antibiotics should be initiated [4, 5]. Once it is confirmed that it is a bullous arthropod bite reaction, antibiotics should be discontinued, and symptomatic treatment like NSAIDs and antihistaminic be provided. Cleaning the site with soap and water is very important for preventing superimposed bacterial infection. Surveillance of the affected area is a must as early identification of the superimposed bacterial infection prevents morbidity and mortality.

Patient education

The patient must be educated about the disease course. After ruling out other serious conditions, patient reassurance is of paramount importance. The patient should be guided for the appropriate care of that area, including avoiding scratching.

Leg elevation should be explained to decrease the edema. After 1 to 2 days, the patient can resume the daily routine of exercise, and it does not affect the disease course.

CONCLUSION

Initially, if cellulitis cannot be ruled out, IV or oral antibiotics should be initiated. Once it is confirmed that it is a bullous arthropod bite reaction, antibiotics should be discontinued, and symptomatic treatment like NSAIDs and antihistaminic be provided. Cleaning the site with soap and water is very important for preventing superimposed bacterial infection. Surveillance of the affected area is a must as early identification of the superimposed bacterial infection prevents morbidity and mortality.

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Author Contributions

Bhargav B Koyani – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Rajvi D Pathak – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Guarantor of Submission

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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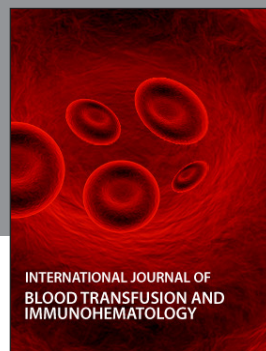
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