*Case Report*
*Olgu Sunumu*

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# An unusual presentation of linear immunoglobulin A dermatosis after coronavirus disease-2019 mRNA vaccine

## *Koronavirüs hastalığı-2019 mRNA aşısı sonrası gelişen atipik prezentasyonlu lineer immünoglobulin A dermatozu*

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**Abstract**

Linear immunoglobulin A bullous dermatosis (LABD) is a rare subepidermal vesiculobullous disease that can develop in children and adults. Although most cases are idiopathic, drugs, infections, and malignancies have also been reported to induce LABD. In this report, we present the case of a 43-year-old female patient who developed LABD with an unusual clinical appearance shortly after immunization with the coronavirus disease-2019 mRNA vaccine.
**Keywords:** Linear IgA dermatosis, COVID-19, vaccine

**Öz**

Lineer immünoglobulin A büllöz dermatoz (LABD) çocuklarda ve erişkinlerde görülebilen nadir bir subepidermal vezikülobüllöz hastalıktır. Çoğu olgu idiyopatik olmakla birlikte; ilaçlar, enfeksiyonlar ve malignitelerin de LABD'yi indüklediği bildirilmiştir. Bu olgu sunumda, koronavirüs hastalığı-2019 mRNA aşısı ile bağışıklandıktan kısa bir süre sonra LABD gelişen 43 yaşında bir kadın hastayı sunuyoruz.
**Anahtar Kelimeler:** Lineer İgA dermatozu, COVID-19, aşı

## Introduction

Linear immunoglobulin A (IgA) bullous dermatosis (LABD; also known as linear IgA dermatosis or linear IgA disease) is a rare subepithelial vesiculobullous disease that is characterized by the linear deposition of IgA at the basement membrane zone (BMZ)[1,2]. As LABD has clinical similarities to other autoimmune diseases including bullous pemphigoid, cicatricial pemphigoid, or dermatitis herpetiformis, direct immunofluorescence of perilesional skin has been utilized as a gold standard for the diagnosis of LABD[3].

LABD has occurred in both adults and children, with a bimodal age of onset[4]. Although the mucosa can be affected in both children and adults, the childhood-onset form of LABD emerges around the mouth and eyes, lower abdomen, thighs, buttocks, genitals, wrists, and ankles, whereas the adult-onset form manifests with lesions on the trunk, head, and limbs[5,6]. In the adult-onset form, even though majority of the cases are idiopathic, infections, malignances, and drugs have been demonstrated as possible triggers, and their etiologies must be extensively evaluated. Vancomycin is the most frequently reported drug that has been associated with LABD. Other pharmacologic agents, such as amiodarone, cephalosporins, and diuretic, have been linked to the drug-induced form[7].

In addition, few cases of LABD developing following vaccination have been reported. To date, vaccinations against influenza and human papillomavirus have been reported to

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be related to LABD[8]. With the COVID-19 pandemic, mRNA vaccines have become widespread today.

mRNA vaccines are a newly developed technology with highly potential to fight cancer and viral diseases through the combination of molecular biology and immunology. These vaccines stimulate both innate and adaptive immunity by delivering the genetic instructions required for the recipient cells to produce an antigen. BNT162b2 (Comirnaty®; BioNTech and Pfizer) is a nucleoside-based mRNA vaccine developed to prevent coronavirus disease-2019 (COVID-19) caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2). As more people are being vaccinated against SARS-CoV-2 during the COVID-19 pandemic, various skin reactions have started to be reported. More recently, COVID-19 mRNA vaccines including BioNTech/Pfizer mRNA COVID-19 vaccine (Comirnaty®) and Oxford AstraZeneca COVID-19 vaccine have been suggested to cause LABD[8,9]. However, the underlying autoimmune mechanism in LABD remains to be elucidated.

## Case Report

A 43-year-old woman presented with a bullous eruption that clinically resembled cellulitis, involving the right lower extremity, and had appeared over a week.

Before her referral to our department, she applied to the infectious diseases and was diagnosed with cellulitis and oral antibiotic treatment, including ciprofloxacin and amoxicillin clavulanate, was prescribed. We were consulted because the lesions did not regressed but progressed. Although the patient had no particular family history, she was taking aripiprazole and quetiapine for atypical psychosis since 2017. There was no change in her long-term medications, and no definite evidence suggested that these drugs triggered the bullous skin lesions. In addition, a second dose of BioNTech/Pfizer mRNA COVID-19 vaccine was administered 7 days before the lesions appeared.

On physical examination, bullous lesions containing tense, serous fluid were observed on a sharply demarcated erythematous background on the distal anterior surface of the lower extremity. Furthermore, it extended toward the back of the foot and leg and in the dorsum of the foot. Impetiginized, yellow crusts were dominant (Figure 1), but were not accompanied by warmth and pain. The oral and genital mucosa were not affected.

Laboratory findings on admission showed the following values: hemoglobin: 9.15 g/dL, (normal: 11.5-16 g/dL); mean corpuscular volume, 76 fL (normal: 80-100 fL); C-reactive protein: 1.36 mg/dL (normal: 0-0.5 mg/dL); and erythrocyte sedimentation rate: 72 mm/h (normal: 0-20 mm/h). Other biochemical parameters were within normal limits. No growth was observed in the wound culture.

Doppler examination findings of the lower extremity veins and arteries were normal, except for slow venous flow pattern in the vena saphena magna.

Biopsy and direct immunofluorescence (DIF) were performed with the preliminary diagnosis of allergic contact dermatitis, cellulitis, and localized bullous pemphigoid.

Histopathological examination revealed subepidermal cleavage and blister formation with a dermal perivascular inflammatory infiltrate consisting predominantly of lymphocytes (Figure 2). DIF microscopy showed a linear pattern of IgA immunodeposits at the BMZ (Figure 3). IgG, IgM, C3, and fibrinogen were negative.

Based on the history, histology, and DIF examination, the diagnosis was LABD. The patient was treated with doxycycline 100 mg per os twice daily and topical clobetasol propionate once daily. She was followed up weekly, and images were taken. When compared with pre-treatment, considerable improvement was observed after 1 month. The bullous lesion and edema had completely disappeared, but erythema had persisted (Figure 4).

## Discussion

LABD, a subepidermal bullous disease characterized by linear deposition of IgA along the BMZ, is idiopathic in the majority of cases.

Drugs are the most common causes of LABD, and vancomycin accounts for approximately 50% of the cases. Drug-induced LABD has more severe and polymorphic clinical features than idiopathic forms. Other possible triggers include vaccination. Little

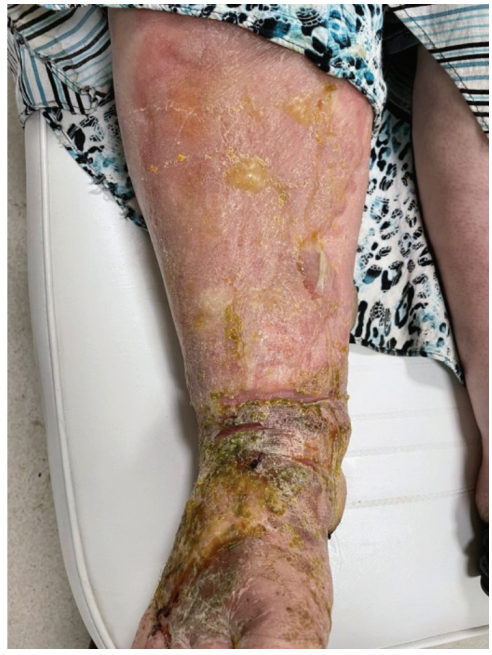

**Figure 1.** Bullous lesions containing tense, serous fluid on a sharply demarcated erythematous background with impetiginized, yellow crusting on the distal anterior surface of the lower extremity

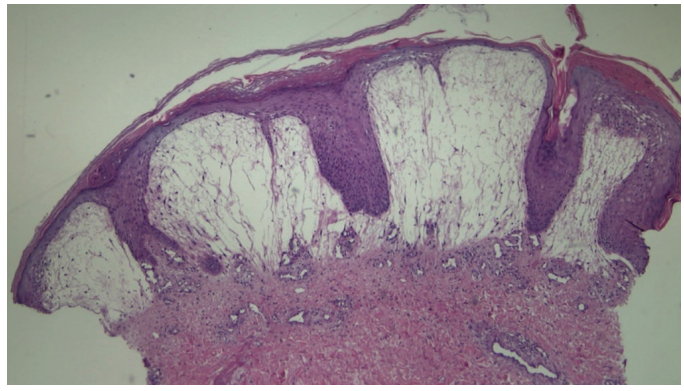

**Figure 2.** Subepidermal cleavage and blister formation with a dermal perivascular inflammatory infiltrate consisting predominantly of lymphocytes, ×40, hematoxylin and eosin staining

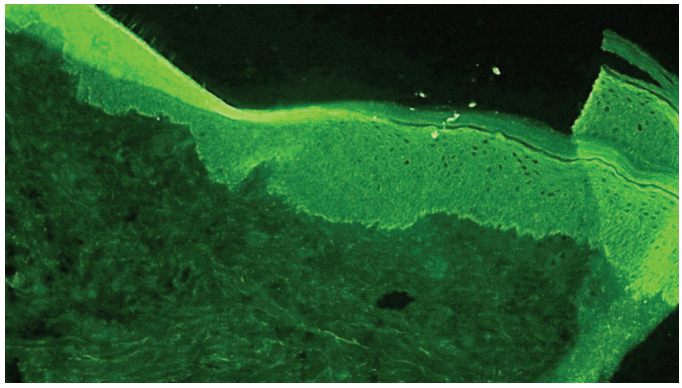

**Figure 3.** Linear pattern of immunoglobulin A immune deposits at the basement membrane zone, ×100, direct immunofluorescence

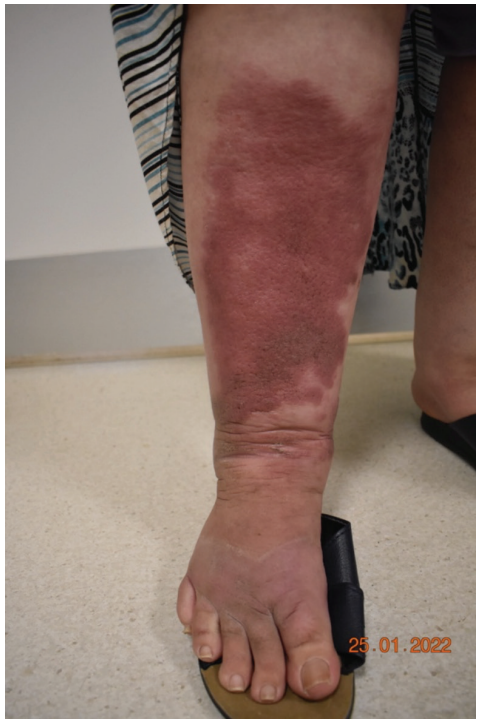


**Figure 4.** Regression of the lesion 1 month after treatment

evidence reveals that vaccines play a role in LABD induction. Some autoimmune reactions were thought to develop after vaccination, and the underlying mechanism has yet to be discovered. Some possible explanations could be sequence or structural similarity (molecular mimicry) of a host antigen to a viral antigen and direct or indirect activation of the host's immune system by viral antigens or cytokines[10].

In our patient, skin lesions developed shortly after immunization, suggesting that vaccination was the most likely the triggering factor. With the COVID-19 pandemic, global immunization occurred rapidly, and cutaneous reactions, including LABD, are reported daily following immunization. In the literature, one COVID-19 mRNA vaccine-induced LABD was reported to date. Thus, this was the second LABD case triggered by COVID-19 mRNA vaccine and was seen in an atypical clinical form.

### Ethics

**Informed Consent:** It was obtained.
**Peer-review:** Externally and internally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: E.E., Y.Ö., B.U., M.G., Concept: E.E., Y.Ö., B.U., M.G., Design: E.E., Y.Ö., B.U., M.G., Data Collection or Processing: E.E., Y.Ö., B.U., M.G., Analysis or Interpretation: E.E., Y.Ö., B.U., M.G., Literature Search: E.E., Y.Ö., B.U., M.G., Writing: E.E., Y.Ö., B.U., M.G.
**Conflict of Interest:** No conflict of interest was declared by the authors.
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