INTRODUCTION

The patients’ discouragement from presentation due to the COVID-19 pandemic resulted in the progression of many manageable diseases to a critical condition. We report a case of carbuncle promotion to the necrotizing fasciitis in the context of undiagnosed diabetes mellitus and delay in visiting physicians due to fear of COVID-19.

A 51-year-old man presented to our clinic with severe neck pain and massive swelling which had been started as a furuncle-like lesion on the nape of the neck 14 days ago with rapid progression. He had refused to seek medical help due to the COVID-19 pandemic. He denied a history of DM and any trauma or bite in this location; however, there was a long history of occipital folliculitis. Besides, he had a history of hyperlipidemia and coronary artery bypass grafting surgery 1 year ago.

Herein, we report a case of necrotizing fasciitis (NF) that was formed from a carbuncle in the context of undiagnosed diabetes mellitus (DM) and delay in visiting physicians due to fear of COVID-19.
pain. Also, there were patches of cicatricial alopecia and tufted folliculitis on the occiput.

Laboratory examination revealed a blood glucose level of 537 g/dL and glycated hemoglobin A1c (HbA1c) was 13%. White blood cell count (WBC) was 14.60 (normal 4.00-11.00 x103/ul), erythrocyte sedimentation rate (ESR) 67 mm/hour, and C-reactive protein (CRP) 37.1 mg/L.

A preliminary diagnosis of carbuncle in the setting of uncontrolled DM was made. The differential diagnoses included actinomycosis, bite reaction, gas gangrene, and cutaneous anthrax. The patient developed rapid extension of erythema, warmth, and tenderness to the interscapular area and shoulders, along with confusion, fever, and tachypnea during the first hours of admission. So, NF was considered.

Soft-tissue ultrasonography and neck computed tomography showed significant soft tissue thickening and increased echogenicity with fat lobulation. Some superficial foci of gas were noticed and interpreted as sinus tracts. No obvious abscess or collection was detected.

Tazocin® (piperacillin/tazobactam) plus vancomycin was started immediately after taking discharge samples for smear and culture, and the patient was sent to the operation room for surgical debridement.

Intraoperatively, a wide horizontal incision was made throughout the posterior neck. Extensive necrosis and pus formation extending deep into the muscles were observed spreading wide beyond the visible erythematous margin; therefore, a vertical incision was added to the interscapular area allowing complete evacuation of pus and necrotic tissues. Histopathological examination revealed fibro-adipose tissue with extensive abscess formation and necrosis. Cultures demonstrated staphylococcus aureus susceptible to methicillin, so the previous antibiotics were continued. Skin biopsy was obtained from the occiput that was compatible with folliculitis decalvans. Consecutive surgical debridement sessions for the next 7 days removed the whole necrotic tissues (Figure 2). After ensuring that the necrosis spread came to a halt, vacuum therapy was administrated for 12 days till granulation tissue filled the wound. After a total of 23 days of hospital admission, the patient was discharged with a shallow ulcer without any complication. The antibiotic regimen was changed to oral cotrimoxazole and clindamycin. Also, routine wound care and insulin therapy were continued, and weekly follow-up for wound assessment was scheduled (Figure 3). In 1-month follow-up, the wound was completely repaired.

**FIGURE 1** A huge carbuncle with multiple sinus tracts discharging a dishwater fluid

**FIGURE 2** Several sessions of debridement resulted in complete removal of necrotic tissue

3 | **DISCUSSION**

A carbuncle manifests as the coalescence of several furuncles ensuing in a single inflammatory mass with multiple draining sinus tracts. It usually starts as a furuncle that affects areas with thick skin, for example, the nape of the neck and
Staphylococcus aureus is the most common cause, and DM stands among predisposing conditions as in our patient. Although the infection may extend deep into the subcutaneous tissues, evolution to the NF rarely occurs.

Necrotizing fasciitis is characterized by rapidly progressive infection of subcutaneous tissue and fascial planes that leads to widespread necrosis and systemic toxicity. It could be life-threatening with a mortality rate ranging from 20% to 60%. The most common sites of involvement are the extremities and the perineum (Fournier gangrene). Early signs of NF include cellulitis, and fever; however, it can progress at a frightening rate. The subcutaneous tissues may become hard and “woody” on palpation with discharge of a thin, malodorous fluid resulting from fat tissue and fascial necrosis. Patients can become extremely toxic ensuing in sepsis and shock. The patient rescue necessitates prompt diagnosis, immediate and aggressive surgical debridement, and broad-spectrum antibiotic therapy. Subsequent surgeries are necessary to remove all necrotic tissues.

Delayed presentation of NF due to the COVID-19 has been described. To our knowledge, the evolution of NF from the carbuncle has not been reported yet in the COVID-19 pandemic.

Although undiagnosed DM promotes the progression of carbuncle to the NF, delay in presentation due to the COVID-19 social distancing plans also can pave the way for this progression.

In conclusion, this case highlights the importance of early diagnosis and management in preventing the progression of an easily controllable condition to a critical illness. Radical surgery and antibiotic therapy along with diabetes control saved the patient in the last hours.

ACKNOWLEDGMENTS
Published with written consent of the patient.

CONFLICT OF INTEREST
None declared.

AUTHOR CONTRIBUTIONS
Mehdi Gheisari: contributed to data gathering, clinical evaluation and management of the patient, writing the manuscript, and supervision of the project. Raziyeh Ganji: contributed to data gathering, writing the manuscript in consultation with Mehdi Gheisari, submission, and correspondence in the journal of Clinical Case Reports. Moein Baghani: contributed to data gathering, writing the manuscript, taking photographs, and preparing for submission in consultation with Mehdi Gheisari. Mohammad-Mehdi Forouzanfar: contributed to clinical evaluation and management of the patient, editing of the final draft of the manuscript.

ETHICAL CONSIDERATIONS
The patient in this manuscript gave written informed consent for the publication of his case details.

DATA AVAILABILITY STATEMENT
The data are available from the corresponding author upon reasonable request.

ORCID
Mehdi Gheisari https://orcid.org/0000-0003-1268-7412
Moein Baghani https://orcid.org/0000-0001-5803-8747
Raziyeh Ganji https://orcid.org/0000-0001-8564-2704

REFERENCES
1. World Health Organization. The impact of the COVID-19 pandemic on noncommunicable disease resources and services: results of a rapid assessment. Geneva: World Health Organization; 2020. License: CC BY-NC-SA 3.0 IGO.
2. Solis E, Hameed A, Brown K, Pleass H, Johnston E. Delayed emergency surgical presentation: impact of corona virus disease (COVID-19) on non-COVID patients. ANZ J Surg. 2020;90(7–8):1485-1483.
3. Sedik A, Rauf MY, Makhdoom M, et al. Huge carbuncle of the neck with intracranial extension: a case report. Int Surg J. 2018;5(3):1154-1157.
4. Espandar R, Sibdari SY, Rafiee E, et al. Necrotizing fasciitis of the extremities: a prospective study. Strategies Trauma Limb Reconstr. 2011;6(3):121-125.
5. Smeets L, Bous A, Heymans O. Necrotizing fasciitis: case report and review of literature. Acta Chir Belgica. 2007;107(1):29-36.
6. Chen RJ, Gillespie C, Jassal K, et al. Delayed presentation of breast necrotising fasciitis due to COVID-19 anxiety. ANZ J Surg. 2020;90(7–8):1485-1487.
7. Sartelli M, Guirao X, Hardcastle TC, et al. 2018 WSES/SIS-E consensus conference: recommendations for the management of skin and soft-tissue infections. *World J Emerg Surg*. 2018;13(1):1-24.

8. Naqvi G, Malik S, Jan W. Necrotizing fasciitis of the lower extremity: a case report and current concept of diagnosis and management. *Scand J Trauma Resuscitation Emerg Med*. 2009;17(1):1-7.

**How to cite this article:** Gheisari M, Baghani M, Ganji R, Forouzanfar M-M. Huge carbuncle leading to necrotizing fasciitis in the COVID-19 pandemic era. *Clin Case Rep*. 2021;9:1583–1586. [https://doi.org/10.1002/ccr3.3839](https://doi.org/10.1002/ccr3.3839)