

Inflammatory Facial Swelling in an Elderly Male: A Rare Case of Cheek Carbuncle

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ABSTRACT

Facial carbuncles are uncommon deep skin and Soft-Tissue Infections (STTI) characterised by coalescent furuncles, extensive tissue necrosis, and multiple draining sinuses. Their occurrence on the face is clinically important because of the potential risk of spread to intracranial structures through the facial venous system. A 61-year-old male presented with a progressively enlarging painful swelling over the left cheek associated with erythema, tenderness, necrotic slough, and multiple discharging sinuses. Clinical examination and ultrasonography revealed a deep infective lesion with internal septations and surrounding soft-tissue oedema. Differential diagnoses including pyogenic abscess, infected sebaceous cyst, odontogenic infection, and soft-tissue malignancy were considered. The diagnosis of cheek carbuncle was established based on characteristic clinical features, imaging findings, intraoperative observations, and microbiological confirmation. The patient underwent surgical debridement with drainage of multiple interconnected purulent cavities followed by intravenous antibiotic therapy guided by microbiological culture findings and regular wound care. Microbiological culture demonstrated *Staphylococcus aureus* infection. Progressive wound healing with healthy granulation tissue formation was observed during follow-up, and no local or systemic complications developed. The present case highlights the importance of considering carbuncle in the differential diagnosis of inflammatory facial swellings, particularly in elderly patients. Early recognition, appropriate imaging, prompt surgical intervention, and targeted antimicrobial therapy are essential to achieve favourable outcomes and prevent potentially serious complications associated with facial infections.

Keywords: Bacterial, Skin diseases, Soft-tissue Infections, Staphylococcal Infections, Surgical debridement, Ultrasonography

CASE REPORT

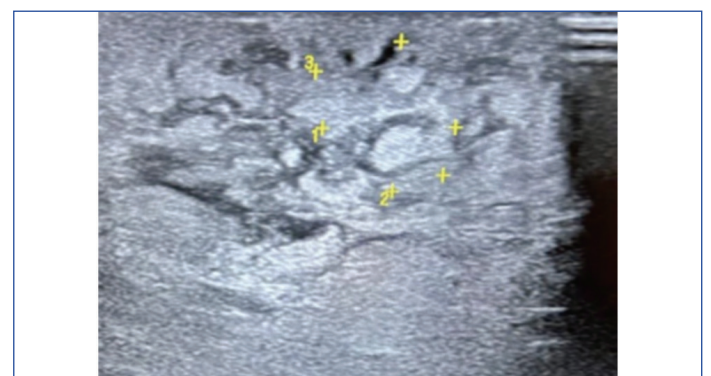
A 61-year-old male presented to the Surgical Outpatient Department with complaints of a painful swelling over the left cheek for approximately one week. The swelling had gradually increased in size and was associated with redness, tenderness, and purulent discharge. The patient reported difficulty in chewing and mild facial discomfort but denied fever, visual disturbances, or neurological symptoms. There was no documented history of diabetes mellitus, immunosuppression, or other major systemic illness. Blood glucose levels were within normal limits at presentation. The available records did not reveal any significant past dental history, recent dental procedures, or odontogenic source of infection [Table/Fig-1].



[Table/Fig-1]: Preoperative picture of a swelling over the left cheek with multiple sinuses.

On physical examination, a diffuse indurated swelling measuring approximately 5×4 cm was noted over the left cheek. The lesion was erythematous with central necrotic slough and multiple discharging sinuses exuding purulent material. The surrounding skin was warm and tender on palpation. No facial nerve weakness or cranial nerve deficit was identified. Cervical lymphadenopathy was absent.

Routine haematological investigations revealed mild leucocytosis with neutrophilic predominance, suggestive of an acute bacterial infection. Blood glucose levels were within normal limits. Ultrasonography of the left cheek demonstrated a heteroechoic lesion with internal septations and surrounding soft-tissue oedema, suggestive of a deep infective collection rather than a simple superficial abscess. The imaging findings supported the clinical diagnosis of a carbuncle involving the cheek [Table/Fig-2]. A provisional diagnosis of facial carbuncle was established based on the characteristic clinical presentation, ultrasonographic findings demonstrating a deep infective lesion with internal septations, intraoperative evidence of extensive necrotic tissue with interconnected abscess cavities. The differential diagnoses considered included pyogenic abscess, infected sebaceous cyst, odontogenic infection, and soft-tissue malignancy.



[Table/Fig-2]: Ultrasound image showing heteroechoic lesion with septations.

Pyogenic abscess was considered because of the painful swelling and purulent discharge; however, the presence of multiple communicating sinuses and extensive necrotic tissue favoured a carbuncle. An infected sebaceous cyst was considered but was subsequently excluded because no cyst wall or encapsulated lesion was identified during surgical exploration. Odontogenic infection was considered unlikely in the absence of dental symptoms or evidence of dental pathology. Soft-tissue malignancy was considered due to the facial location and inflammatory appearance but was excluded because of the acute clinical presentation, intraoperative findings, and microbiological confirmation of infection.

The patient was admitted and initiated on empirical intravenous antibiotic therapy targeting Gram-positive organisms. Surgical exploration was performed under aseptic conditions. Wide local debridement of necrotic tissue was undertaken, and multiple interconnected pockets of pus were drained. The wound cavity was thoroughly irrigated with saline and antiseptic solution [Table/Fig-3]. Following surgical debridement and drainage, the wound was left open to facilitate continued drainage and was managed with regular dressing changes, allowing healing by secondary intention. Progressive granulation tissue formation and satisfactory wound healing were subsequently observed during follow-up. Intraoperatively, extensive necrosis involving the dermal and subcutaneous tissues was identified, confirming the diagnosis of carbuncle. Tissue samples were obtained and sent for microbiological culture and sensitivity testing. Culture of the debrided tissue demonstrated growth of *Staphylococcus aureus*. Based on culture findings, antibiotic therapy was continued according to microbiological recommendations. Detailed sensitivity data were not available in the records reviewed.

Postoperatively, the patient received intravenous antibiotics and regular wound care with daily dressings. Healthy granulation tissue developed progressively, and the wound gradually decreased in size [Table/Fig-4]. At one-week follow-up, significant clinical improvement was observed with reduction in local inflammation and satisfactory

wound healing. No postoperative complications such as facial nerve injury, systemic infection, or progression of disease were noted. The patient continued outpatient wound care until complete healing was achieved.

DISCUSSION

Carbuncles are deep bacterial infections involving multiple adjacent hair follicles with extension into the dermis and subcutaneous tissue, resulting in extensive tissue necrosis and the formation of multiple draining sinuses. They are most commonly caused by *Staphylococcus aureus* and are categorised among complicated skin and SSTIs. Although carbuncles typically occur on the nape of the neck, back, and shoulders, involvement of the face is uncommon and therefore may present a diagnostic challenge [1,2]. The present case is clinically significant because the lesion occurred over the cheek, a relatively rare site for carbuncle formation. Facial carbuncles warrant particular attention because of the unique venous anatomy of the face. Venous drainage from the facial region communicates with the cavernous sinus through valveless venous channels, creating a potential route for intracranial spread of infection. Consequently, delayed diagnosis or inadequate treatment may result in severe complications such as septic thrombophlebitis, cavernous sinus thrombosis, meningitis, and systemic sepsis [2-4].

Several predisposing factors have been implicated in the development of carbuncles, including diabetes mellitus, obesity, advanced age, malnutrition, chronic kidney disease, poor hygiene, and immunosuppression [3,4]. Among these, diabetes mellitus is the most consistently reported risk factor because hyperglycaemia adversely affects neutrophil chemotaxis, phagocytosis, and intracellular bacterial killing [3]. In the present case, although the patient belonged to an elderly age group, there was no documented history of diabetes mellitus or immunosuppression, and blood glucose levels were within normal limits. This observation emphasises that facial carbuncles can occur even in the absence of classical metabolic risk factors and should remain an important differential diagnosis in elderly patients presenting with inflammatory facial swellings.

The clinical presentation in this patient was characterised by progressive cheek swelling associated with erythema, tenderness, central necrosis, and multiple discharging sinuses. These findings are characteristic of carbuncle formation and reflect the coalescence of multiple infected hair follicles into a single necrotising lesion. Similar presentations have been described in previous studies evaluating severe skin and SSTIs, where extensive tissue necrosis and multiple draining sinus tracts were indicative of advanced disease requiring surgical intervention [5,6].

An important aspect of this case was the consideration of differential diagnoses. Pyogenic abscess, infected sebaceous cyst, odontogenic infection, and soft-tissue malignancy were all considered. The presence of multiple communicating sinuses and extensive tissue necrosis favoured carbuncle rather than a simple abscess. Odontogenic infection was excluded because there was no clinical evidence of dental pathology, while infected sebaceous cyst was ruled out intraoperatively due to the absence of a cyst wall. The acute inflammatory presentation, microbiological confirmation of bacterial infection, and favourable response to debridement and antibiotic therapy also helped exclude malignant pathology. Careful evaluation of these differential diagnoses was essential to establish an accurate diagnosis and avoid inappropriate management.

Ultrasonography played a crucial role in the diagnostic workup. The lesion appeared as a heteroechoic collection with internal septations and surrounding inflammatory oedema, suggesting a complex infective process rather than a localised superficial abscess. Tayal VS et al., demonstrated that soft-tissue ultrasonography significantly improves diagnostic accuracy and influences clinical management in patients presenting with cellulitis and abscesses [7]. In the



[Table/Fig-3]: Intraoperative image showing wound picture after debridement.



[Table/Fig-4]: Image showing postoperative wound after one week.

present case, ultrasound findings supported the clinical suspicion of carbuncle and facilitated appropriate surgical planning.

Microbiological culture confirmed *Staphylococcus aureus* infection, which remains the predominant pathogen associated with carbuncles and complicated skin and SSTIs [8,9]. Increasing global reports of Methicillin-Resistant *Staphylococcus aureus* (MRSA) have highlighted the importance of obtaining culture and sensitivity testing whenever possible [3,10]. Recent epidemiological studies continue to demonstrate a substantial burden of both methicillin-susceptible and MRSA infections worldwide, underscoring the need for culture-directed antimicrobial therapy [11,12]. Culture-guided treatment not only improves therapeutic efficacy but also helps minimise antimicrobial resistance and reduces the likelihood of treatment failure or recurrence.

Management of carbuncles depends on the severity and extent of infection. While early lesions may respond to antimicrobial therapy alone, advanced lesions with abscess formation and necrosis usually require surgical drainage or debridement [1,6]. The present patient demonstrated extensive tissue necrosis and multiple interconnected purulent cavities, necessitating wide local debridement. Surgical removal of necrotic tissue reduces bacterial burden, improves drainage, facilitates antibiotic penetration, and promotes wound healing [9]. Similar recommendations are reflected in international skin and SSTIs management guidelines, which advocate prompt surgical source control in complicated infections [1,4].

Appropriate antimicrobial therapy remains an essential adjunct to surgical management. The Infectious Diseases Society of America guidelines emphasise the importance of selecting antibiotics based on culture and sensitivity patterns, particularly in regions where MRSA prevalence is increasing [9-13]. Therefore, the favourable clinical outcome observed in the present case can be attributed to the combination of timely surgical debridement, microbiological evaluation, and appropriate antimicrobial therapy [1,4,6].

Following treatment, the patient exhibited progressive wound healing characterised by the development of healthy granulation tissue and reduction of local inflammation. No facial nerve injury or systemic complications were observed during follow-up. Previous studies have similarly reported favourable outcomes when facial carbuncles are recognised early and treated aggressively before the onset of intracranial or systemic dissemination [5,6].

The present case highlights several important clinical lessons. First, carbuncle should be considered in the differential diagnosis of inflammatory facial swellings, especially when multiple draining sinuses and tissue necrosis are present. Second, ultrasonography provides valuable diagnostic information regarding lesion extent and complexity. Third, microbiological confirmation remains essential for guiding antibiotic therapy in the era of increasing antimicrobial resistance. Finally, prompt surgical debridement combined with

appropriate antimicrobial treatment remains the cornerstone of management and is associated with excellent clinical outcomes even in rare facial presentations.

CONCLUSION(S)

Facial carbuncle is an uncommon but clinically significant skin infection that can lead to serious complications if not treated promptly. Accurate diagnosis through clinical assessment and imaging is essential to distinguish carbuncles from other facial swellings. Early surgical debridement combined with appropriate antimicrobial therapy results in favourable outcomes. Awareness of this rare presentation can help clinicians prevent delayed diagnosis and potentially life-threatening complications.

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AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Apr 01, 2026
- Manual Googling: Jul 11, 2026
- iThenticate Software: Jul 13, 2026 (5%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

Date of Submission: Mar 06, 2026
Date of Peer Review: May 22, 2026
Date of Acceptance: Jul 15, 2026
Date of Publishing: Sep 01, 2026