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Occipital necrotizing fasciitis – a case report of diagnostic and surgical challenges from an atypical anatomical presentation

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ABSTRACT

Introduction and aim. Necrotizing fasciitis (NF) is a rapidly progressive soft tissue infection with high mortality. While most cases involve the extremities or perineum, isolated occipital scalp NF is exceptionally rare, often leading to delayed recognition. We present a case describing its unusual site, diagnostic pitfalls, and surgical challenges.

Description of the case. A 48-year-old man presented with one week of progressive swelling and pain following rupture of a boil-like lesion on the occipital region. Examination revealed a 20×20 cm erythematous, tender, and swelling. The primary survey was unremarkable. Laboratory results showed hyperglycemia (490.6 mg/dL), hyponatremia (122.0 mEq/L), and leukocytosis (26.72×10⁹/L). Imaging suggested a localized abscess, initially managed with incision and drainage. Rapid necrosis progression necessitated emergent wide debridement, confirming NF. Intraoperative bleeding complicated tissue assessment. Negative pressure wound therapy was attempted but discontinued due to anatomical limitations. The patient improved with repeated debridements, antibiotics, and reconstructive surgery.

Conclusion. This case highlights the rarity of occipital NF and the risk of low clinical suspicion in atypical locations, emphasizing the importance of early recognition and tailored surgical management.

Keywords. case report, diabetes mellitus, necrotizing fasciitis, occipital, posterior neck

Introduction

Necrotizing fasciitis (NF) is a rare but devastating soft tissue infection with reported in-hospital mortality rates as high as 30%.[1] It is a rapidly progressive and life-threatening condition that can lead to septic shock and multiorgan failure if not promptly treated.[2,3] Early diagnosis and surgical debridement are critical, yet initial presentations can be subtle and deceptively benign. While NF typically involves the extremities, perineum, or abdominal wall, head and neck involvement accounts for only 1–10% of cases.[4,5] Occipital involvement is particularly uncommon, with only isolated reports in the literature. One previously published case described occipital NF arising in the setting of psoriasis.[6]

Aim

We report a case of NF confined to the occipital scalp and posterior neck in a clinically stable patient with newly diagnosed diabetes mellitus, initially mistaken for a localized abscess. Our case expands on the limited literature by highlighting diagnostic uncertainty and technical challenges unique to this location. Suspicion is often low when NF occurs outside the typical sites, and subtle early features may further obscure recognition. Management is also complicated because no established guidelines exist, and intraoperative decisions rely heavily on clinical judgment. In the scalp, abundant vascularity blurs the distinction between necrotic and granulating tissue and makes hemostasis more difficult. Furthermore, applying negative pressure wound therapy in this region requires special consideration of neck flexion and patient comfort.

Description of the case

A 48-year-old man presented with a one-week history of progressive occipital swelling. Two weeks earlier, he had noticed a small, boil-like lesion approximately 0.5 cm in diameter on the occipital scalp that ruptured three days later, discharging purulent material. Believing it to be a minor superficial infection, he did not seek medical attention. Over the next few days, he developed neck stiffness, subjective fever, localized throbbing pain, and swelling that interfered with sleep. He self-medicated with paracetamol.

On day seven, his wife observed spreading erythema and multiple nodules. A week later, he sought care at our emergency department. On arrival, his primary survey was unremarkable, and he appeared clinically stable without signs of sepsis. Local examination revealed a 20×20 cm erythematous, fluctuant mass extending from the occiput to the posterior cervical region with edema, superficial bleeding, and yellowish crusting (Fig. 1).

Fig. 1. Posterior view of the occipital and cervical region at initial presentation

Initial labs showed marked hyperglycemia (random blood glucose: 490.6 mg/dL), corrected hyponatremia (122.0 mEq/L), leukocytosis (26.72×10⁹/L, 87.4% neutrophils), and partially compensated metabolic acidosis. Blood ketones were mildly elevated. The surgical team assumed care and requested a contrast-enhanced MRI of the brain and cervical spine, performed using a Philips Ingenia 1.5T. Internal medicine was consulted for glycemic and metabolic stabilization.

The MRI revealed an abscess in the subgaleal and subcutaneous layers of the posterior parietal and occipital regions, extending into the posterior cervical paravertebral soft tissues (C1–C4), involving multiple muscles (semispinalis capitis, splenius capitis, splenius cervicis, longissimus capitis, superior sternocleidomastoid, trapezius) with no spinal or bone involvement (Fig. 2).

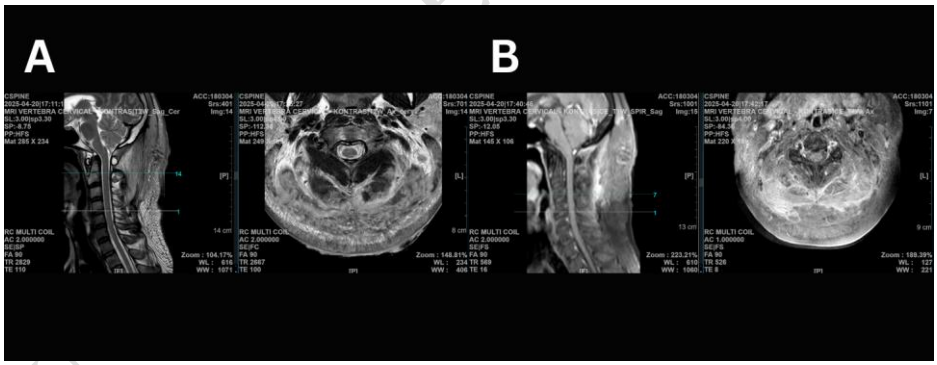

Fig. 2. MRI of the occipital and cervical region, A: Sagittal and axial T_2-weighted images, B: Sagittal and axial T_1-weighted images

Based on clinical and radiologic findings, the patient was diagnosed with a localized occipital abscess. Initial management included wound care with 0.9% saline-soaked gauze, intravenous fluids, and analgesics. On hospital day two, following glycemic stabilization, he underwent urgent incision and drainage under general anesthesia. A 10 cm transverse incision released purulent, blood-tinged fluid. A secondary 5 cm incision was made inferiorly to access a second, septated collection (Fig. 3). Both cavities were irrigated and packed with iodine-soaked gauze for secondary intention healing and then transitioned early to daily honey-impregnated gauze dressings. The patient was started empirically on ampicillin-sulbactam and

metronidazole. Tissue cultures grew *Staphylococcus aureus,* and antibiotics were adjusted to ceftriaxone and metronidazole based on sensitivities. He was monitored in the ICU for two days before transfer to the ward and was discharged on postoperative day four with outpatient follow-up.

Fig. 3. Postoperative appearance following initial incision and drainage

Three days later, the patient was readmitted due to worsening necrosis and purulent discharge. Examination revealed undermined tissue planes and rapid spread beyond the prior surgical site, raising strong suspicion for NF. Emergent necrotomy and fasciotomy were performed. Debridement revealed a 10×12 cm area of necrotic scalp with spongy, septated subcutaneous tissue and necrotic fascia. The proximal cervical muscles showed friable, granulation-like tissue that bled easily, complicating differentiation between viable and nonviable tissue due to the scalp's rich vascularity. A tissue specimen was submitted for culture and histopathology. Estimated blood loss was 800 mL, and the patient received 230 mL of packed red blood cells. Hemostasis was achieved. The wound was left open and packed (Fig. 4). Microscopic examination showed necrotic skin overlaid by epidermis, with dense infiltration of lymphocytes, histiocytes, and neutrophils extending into the dermis and subcutaneous tissue. Areas of hemorrhage and fibrin deposits were also present. These findings support the clinical and operative diagnosis of NF, with evidence of extensive soft tissue necrosis and mixed acute and chronic inflammation. Postoperatively, wound care with daily honey-impregnated gauze dressings continued. He remained on the same antibiotics regimen and was monitored in the intensive care unit for two days before transfer to the general ward.

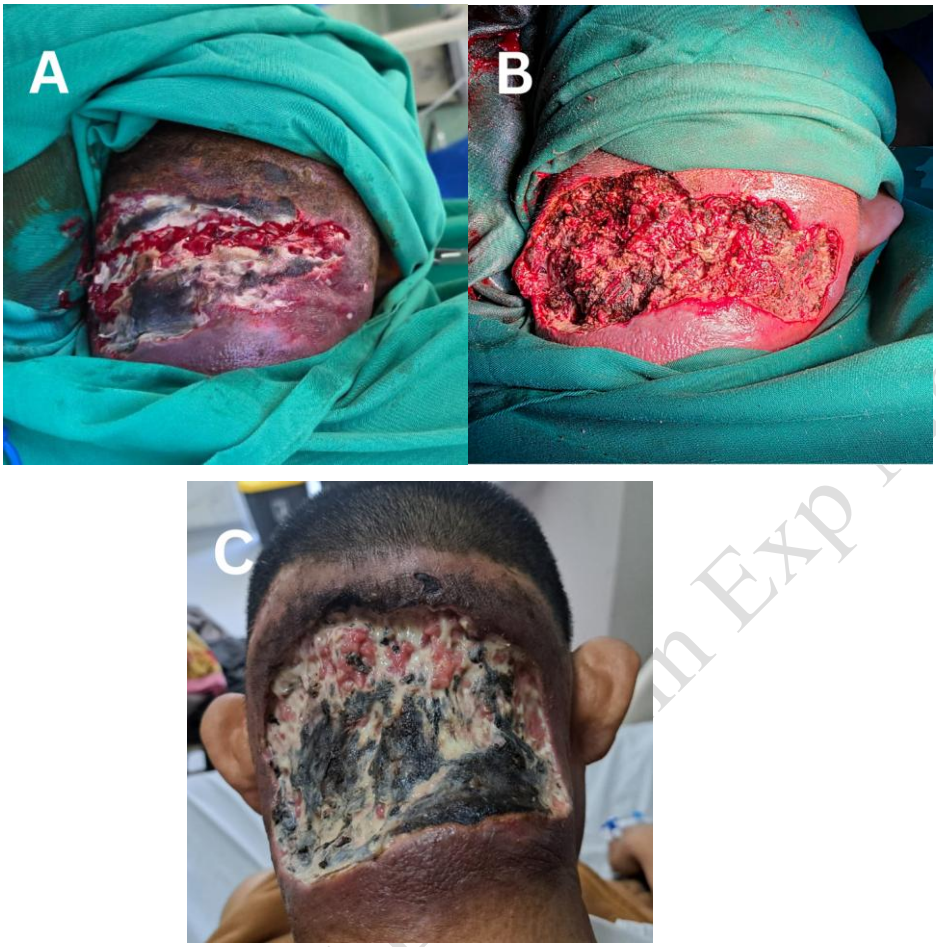

Fig. 4. Sequential images for the second debridement procedure, A: Preoperative view showing necrosis, B: Intraoperative view revealing devitalized fascia, C: Postoperative wound with eschar

Six days after the second surgery, a final debridement was performed in preparation for negative pressure wound therapy (NPWT). The patient was positioned prone with limited cervical flexion. Residual necrotic tissue was excised, and blood loss was estimated at 15 mL (Fig. 5). Tissue samples were obtained for culture, with the antibiotic regimen maintained. NPWT was initiated using the Renasys Touch system by Smith & Nephew, with intermittent suction set at 40 mmHg for two minutes and 120 mmHg for four minutes.

Fig. 5. Intraoperative view during the third debridement demonstrating a clean wound bed

On the second day of NPWT, the system appeared to leak due to dressing dislodgement caused by cervical flexion during daily activity. Sounds from the tubing suggested a problem, but the device did not display any failure notifications. Attempts to restore suction were unsuccessful, and the device ultimately developed a mechanical obstruction. Consequently, the decision was made to discontinue NPWT and resume conventional open wound management. The wound healed well without new infection or need for further debridement. The patient stabilized clinically and was discharged the next day with outpatient follow-up. Plastic surgery was consulted, and definitive reconstruction was performed 20 days after the final debridement (Fig. 6).

Fig 6. Post-reconstruction view showing the scalp and posterior neck

During the reconstruction, a 12×4.5 cm granulating defect was identified. After tumescent infiltration, the wound edges were refreshed, and the granulation tissue was shaved. A double rotation flap was then

designed. The superior left flap was rotated superiorly with a defect-to-flap ratio of 1:8, while the inferior right flap was rotated inferiorly using a cut-as-you-go technique. The scalp flap was elevated in the loose areolar plane, and the neck flap in the subcutaneous plane. Both were mobilized sufficiently for tension-free closure. A vacuum drain was placed. Intradermal suturing was performed with Vicryl (Ethicon) 2-0 and 3-0. The scalp skin was closed with a skin stapler, and the remaining incisions with Prolene (Ethicon) 2-0 and 3-0. The wound was dressed in tulle and sterile gauze. The procedure was completed uneventfully**.** Figure 7 presents a concise chronological overview of the events related to this case.

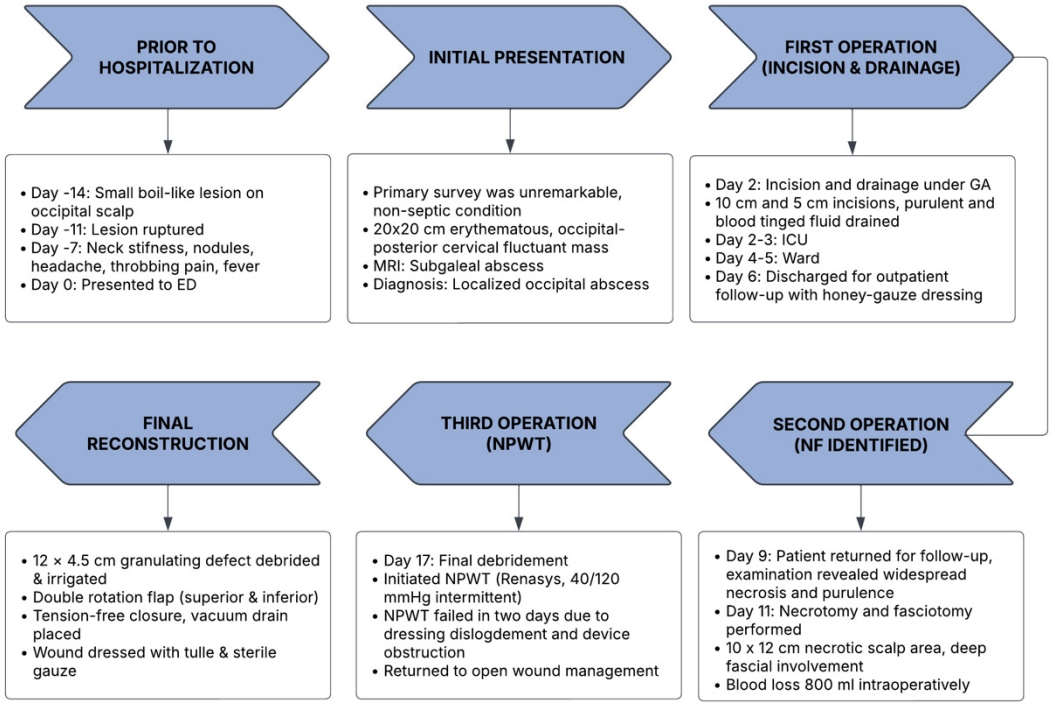

Fig. 7. Clinical timeline summarizing symptom progression, interventions, and recovery

Discussion

NF is a rare, aggressive soft tissue infection that requires early recognition and surgical intervention to prevent mortality. Although advanced disease may present with sepsis, shock, or multiorgan failure, the early course is often nonspecific and easily mistaken for cellulitis or other soft tissue infections. Clinical features considered atypical, including absence of fever, stable vital signs, minimal skin changes, or subtle pain, are in fact encountered in the initial phase and contribute to diagnostic delay.[2,3]

In our case, the patient appeared stable and afebrile, with only localized swelling that initially suggested a simple abscess. Laboratory results showed hyperglycemia, hyponatremia, and neutrophilic leukocytosis. Although diabetes had not been previously diagnosed, it likely increased both susceptibility and diagnostic delay. Diabetes impairs neutrophil function and reduces tissue perfusion, blunting inflammatory responses and obscuring early signs of NF.[7]

The occipital scalp is an exceptionally rare site of involvement, in contrast to the extremities, trunk, or perineum, where NF is more commonly reported.[4] This atypical location contributed to diagnostic delay and conservative initial management. In addition to such rare anatomical sites, NF has also been described after cosmetic procedures and in uncommon mycotic etiologies, reflecting its expanding spectrum.[8,9] These variations highlight the need for clinicians to maintain a heightened index of suspicion when evaluating soft tissue infections.

With no established guidelines for occipital or posterior neck NF, the team opted for limited drainage, consistent with 2015 World Society of Emergency Surgery recommendations for stable patients without signs of necrosis.[10] The posterior neck is also thought to resist deep infection due to thicker skin, unlike anterior infections like descending necrotizing mediastinitis, which require early, wide debridement.[11–13] In such cases, decisions must rely on anatomical reasoning and clinical judgment.

The scalp's rich vascularity, supplied by branches of both the external and internal carotid arteries, is thought to support a strong immune response and promote healing.[14,15] This has led some to favor conservative management in scalp infections.[16] In our case, this presumed protection contributed to delayed debridement. However, the loose areolar tissue beneath the galea aponeurotica provides a potential space for rapid horizontal spread, which likely facilitated the disease's unexpectedly aggressive course.[15]

Paradoxically, this same vascularity complicates intraoperative assessment. In hypervascular regions like the scalp, bleeding is not a reliable indicator of viability. Intraoperative evaluation typically relies on visual and tactile cues such as color, bleeding, and texture, but an inflamed, friable cervical muscle mimicked granulation tissue, making it difficult to distinguish necrotic from viable structures.[17] This led to extended dissection and significant blood loss requiring transfusion. Thus, vascular density may obscure necrosis, adding complexity to surgical decision-making in scalp NF.

NPWT has demonstrated favorable outcomes in head and neck wounds across various settings.[18] However, its use in the occipital scalp and posterior neck presents a unique anatomical challenge. In our case, routine cervical flexion during daily activities and salat caused the NPWT dressing to dislodge. The dressing had been applied with the neck only partially flexed. Applying it in maximal flexion from the start would have better accommodated the patient's range of motion. While NPWT is increasingly used for complex wounds, occipital application requires specific precautions that remain under recognized in the literature.

Finally, the limitation of our study is that it reports a single patient, which inherently restricts its generalizability and precludes comparison with alternative treatment strategies. Nonetheless, it offers useful guidance for clinicians facing similar diagnostic and operative challenges.

Conclusion

This report describes a rare case of NF confined to the occipital region, an anatomical site with little prior documentation. From a clinical perspective, its atypical location and initially subtle presentation delayed

recognition, emphasizing the need to consider NF even when systemic signs are preserved. The case also highlights how the scalp's vascularity may obscure necrosis, how subgaleal spread accelerates progression, and how posterior neck anatomy complicates wound management, including negative pressure therapy. Greater awareness of these features can guide timely diagnosis and surgical decisions, ultimately improving outcomes in similarly uncommon presentations.

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Declarations

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Author contributions

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Conceptualization, K. and L.E.; Methodology, L.E. and K.M.; Formal Analysis, K., L.E., and K.M.; Investigation, K.; Resources, K.; Data Curation, L.E. and K.M.; Writing – Original Draft Preparation, L.E.; Writing – Review & Editing, K., L.E., and K.M.; Visualization, K.M.; Supervision, K.

Conflicts of interest

The authors declare that they have no competing interests.

Data availability

No datasets were generated or analyzed during this study.

Ethics approval

The authors confirmed that informed consent was obtained from the patients, including consent for publication of photographs and clinical details. Patients were assured that their identities and confidentiality would be protected.

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