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Flesh-Eating Necrotizing Fasciitis of the Temporal Region: An Unusual Post-Traumatic Presentation

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Abstract: ***Necrotizing fasciitis, though infrequent in the craniofacial region, represents one of the most aggressive and destructive infections of soft tissue. In our view, what makes this case noteworthy is not just the rare temporal bone involvement, but the way it unfolded following a seemingly straightforward traumatic injury. The infection's rapid progression-from localized laceration to extensive necrosis-highlights how deceptive early presentations can be. It is evident that early suspicion and swift multidisciplinary management make the difference between recovery and catastrophe. This report traces the journey of a 60-year-old male who developed post-traumatic temporal necrotizing fasciitis, managed through prompt surgical fasciotomy, broad-spectrum antibiotics, and split-thickness skin grafting. The clinical turnaround after aggressive intervention suggests that even in atypical, non-odontogenic cases, decisive surgical action and coordinated care remain the cornerstone of successful outcomes. Taking this further, the case serves as a practical reminder that delayed diagnosis-even by a day-can turn a curable wound into a life-threatening crisis.***

Keywords: Necrotizing fasciitis, temporal bone infection, surgical fasciotomy, split-thickness skin graft, post-traumatic wound

1. Introduction

Necrotizing fasciitis is a severe and rapidly advancing bacterial infection that compromises the integrity of the skin, subcutaneous tissues, and fascial planes. Initially characterized by Wilson in 1952, the condition can progress to involve deeper muscular structures, leading to tissue edema, lymphocytic infiltration, and vascular thrombosis. In the absence of timely medical intervention, it may culminate in extensive tissue necrosis, septic shock, and multi-organ dysfunction, including impairment of renal, hepatic, and cardiac systems [1].

The infection is most frequently attributed to *Streptococcus* and *Staphylococcus* species, with Group A β-hemolytic *Streptococcus pyogenes* recognized as a predominant causative agent. Colloquially referred to as "flesh-eating bacteria," necrotizing fasciitis poses a significant clinical challenge due to its fulminant course and potential for systemic involvement [2].

This report underscores the necessity of early recognition and aggressive management in a case of necrotizing fasciitis affecting the temporal bone following traumatic injury. The patient underwent successful treatment involving broad-spectrum intravenous antibiotics, surgical fasciotomy, and subsequent reconstruction using split-thickness skin grafting.

2. Case Report

A 60-year-old male presented to our casualty following a road traffic accident (RTA) that had occurred one day prior. Clinical examination revealed a linear laceration measuring 7 × 1 cm, extending from the right frontal region to the temporal area. Additional injuries included a C4 cervical spine fracture and a fracture of the left humeral head. The patient had no known history of diabetes mellitus.

Radiological evaluation, including computed tomography (CT) of the brain and facial bones, demonstrated no fractures involving the facial skeleton or cranial vault. The diagnosis was consistent with a post-traumatic soft tissue injury of the scalp, characterized by an open wound. The cervical spine fracture necessitated immobilization with a neck collar.

Initial surgical management included wound debridement, closure, and orthopedic fixation of the associated fractures. On the seventh day of hospitalization, clinical signs of wound deterioration were noted in the temporal region, including softening of the tissue, localized pain, fever, and malaise. Laboratory investigations revealed a markedly elevated C-reactive protein (CRP) level of 21.6 mg/mL, suggestive of systemic inflammation and possible infection.

Empirical antibiotic therapy was initiated with intravenous Piperacillin-Tazobactam (4 × 2 g/day for five days) oral Amikacin (500 mg/day) and other supportive medications. By the tenth day, the wound exhibited scab-like, non-viable tissue, prompting surgical intervention. [Fig 1]. A fasciotomy was performed under general anesthesia to excise the necrotic tissue and achieve thorough debridement [Fig 2].

Reconstructive surgery was undertaken following fasciotomy using a split-thickness skin graft, harvested from the left thigh with the aid of a dermatome [Fig. 3]. A bolster dressing was applied to ensure optimal graft adherence. The graft was meticulously secured over the exposed temporal region using surgical staples, following which the patient was transferred to the postoperative care unit [Fig. 4]. The postoperative course was uneventful, and the patient was discharged on postoperative day two, demonstrating satisfactory clinical recovery without any complications.

3. Discussion

Necrotizing fasciitis is a rapidly progressive and potentially fatal soft tissue infection that primarily affects the skin and subcutaneous layers, extending along the superficial fascial

planes. It is characterized by extensive tissue necrosis and systemic toxicity. Commonly referred to as "flesh-eating disease," this condition is known for its aggressive nature and capacity to cause widespread tissue destruction. Early clinical recognition remains challenging due to its initially subtle presentation, unless complicated by systemic manifestations such as toxic shock syndrome or multi-organ dysfunction [1,7].

The clinical severity of necrotizing soft tissue infections is influenced by multiple factors, including the underlying etiology, depth of tissue involvement, anatomical boundaries, and the specific compartments affected. Microbiological profile and host-related factors-such as immune status and comorbidities-also play a critical role in disease progression [4]. The most commonly isolated pathogens include *Streptococcus*, *Staphylococcus*, *Fusobacterium*, and *Acinetobacter* species, with polymicrobial infections frequently observed. Timely diagnosis, aggressive surgical debridement, and empiric broad-spectrum antibiotic therapy are essential to reduce morbidity and mortality [7].

Facial involvement in necrotizing fasciitis is relatively rare but clinically significant. The periorbital region is often the initial site of infection, with potential for rapid extension to adjacent areas such as the temporal fossa, forehead, and neck via the superficial musculoaponeurotic system. In the present case, the patient sustained a traumatic laceration in the temporal region, which subsequently progressed to necrotizing fasciitis.

A systematic review conducted by Hernández et al. analyzed 24 studies encompassing 29 adult cases of facial necrotizing fasciitis. The condition was more prevalent among males, with cutaneous trauma identified as the most common initiating factor. Diabetes mellitus emerged as the most frequent systemic comorbidity. Clinically, swelling and localized pain were the predominant early symptoms, with the periorbital region being the most commonly affected site. Group A *Streptococcus* was the leading causative organism. Notably, over half of the patients required advanced airway management, and surgical intervention was performed in 90% of cases [5].

Several predisposing factors have been associated with necrotizing fasciitis, including advanced age, trauma (blunt or penetrating), burns, chronic alcohol use, peripheral vascular disease, diabetes mellitus, HIV infection, intravenous drug use, malnutrition, organ failure, obesity, hepatic dysfunction, and malignancy [5].

Further insights were provided by Yan et al. through a case series and meta-analysis spanning three decades, focusing on head and neck presentations of necrotizing fasciitis. Odontogenic infections were identified as the most common source. The majority of patients underwent serial surgical debridement in conjunction with intravenous antibiotic therapy. *Streptococcus pyogenes* was the most frequently isolated pathogen, although polymicrobial infections were also prevalent. Among the cohort, 27 patients required skin grafting, and 9 underwent flap reconstruction. The overall mortality rate was 12.3%, with advanced age serving as a significant predictor. Diabetic patients demonstrated increased mortality risk and a greater need for repeated debridement compared to non-diabetic individuals [8,9,10].

In the present case, the patient was non-diabetic and sustained a temporal region laceration following trauma. Initial wound debridement was performed; however, progressive signs of sepsis and tissue ischemia necessitated fasciotomy. Reconstruction was successfully achieved using a split-thickness skin graft harvested from the left thigh. The associated cervical spine fracture was managed conservatively with immobilization using a cervical collar.

4. Conclusion

This case underscores a rare and clinically significant presentation of necrotizing fasciitis involving the temporal region-an anatomical site not typically associated with this condition. While most head and neck cases are odontogenic in origin and commonly affect the periorbital or cervical areas, this instance deviates from the norm, arising secondary to trauma and without underlying systemic comorbidities such as diabetes. To the best of our knowledge, this represents one of the very few documented cases of necrotizing fasciitis originating in the temporal region from a non-odontogenic source, successfully managed through timely fasciotomy and split-thickness skin graft reconstruction. The outcome reinforces the importance of early recognition, aggressive surgical intervention, and multidisciplinary care in achieving favorable results in atypical presentations of this life-threatening infection.

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Addendum



Figure 1: Necrotic area over the temporal region, scab negative for pin prick test



Figure 2: Intra operatively, muscle layer exposed followed by surgical debridement of eschar and necrotic tissue

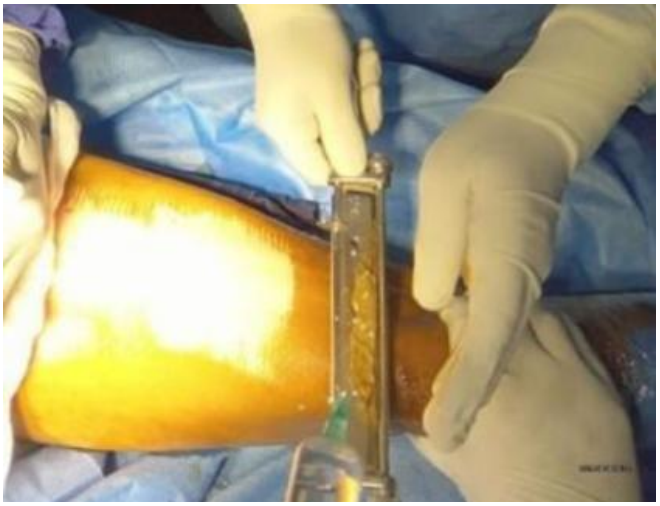


Figure 3: Harvesting of split thickness skin graft from left thigh using a dermatome



Figure 4: Postoperative healing observed after reconstruction with split-thickness skin graft secured with staples over the temporal region