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Necrotizing Fasciitis: a Surgical Challenge in Contemporary Clinical practice

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ANNOTATION

Necrotizing fasciitis (NF) is a rapidly progressing, life-threatening soft tissue infection that demands immediate surgical intervention. Despite being a rare condition, it is associated with high morbidity and mortality rates due to its fulminant course and systemic complications. This review article summarizes current surgical strategies in the treatment of necrotizing fasciitis based on recent literature. Emphasis is placed on the timing and extent of debridement, the role of repeated surgical revisions, amputation criteria, and the integration of adjunctive therapies such as negative pressure wound therapy and reconstructive procedures. We also analyze clinical decision-making in patients with comorbidities including diabetes mellitus and immunosuppression. The article highlights the importance of early recognition, radical surgical tactics, and a multidisciplinary approach in improving patient outcomes. By reviewing global surgical experiences and evidence-based recommendations, we aim to provide a comprehensive perspective on the optimal management of necrotizing fasciitis.

Keywords*: necrotizing fasciitis; surgical debridement; amputation; negative pressure wound therapy; soft tissue infection*

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INTRODUCTION

Necrotizing fasciitis (NF) is a rapidly progressing, life-threatening infection of the soft tissues, characterized by widespread necrosis of the fascia and subcutaneous tissue. Despite its relative rarity, NF represents a critical surgical emergency due to its aggressive clinical course, diagnostic complexity, and persistently high mortality rates, which may exceed 40% in vulnerable populations [1].

The initial presentation of NF is frequently nonspecific, mimicking benign skin or subcutaneous infections such as cellulitis or erysipelas. However, what distinguishes NF is its rapid extension along fascial planes, often in the absence of overt cutaneous manifestations during early stages. A hallmark symptom is severe, disproportionate pain, often preceding systemic toxicity and visible skin changes [2].

The etiological agents of NF vary depending on the classification type, but Group A Streptococcus (GAS), Staphylococcus aureus, and various anaerobes are commonly implicated. Polymicrobial infections are more frequent in immunocompromised individuals, postoperative patients, and those with underlying metabolic disorders such as diabetes mellitus [3].

Even with modern advances in antimicrobial therapy and intensive care, surgical debridement remains the cornerstone of effective treatment. Delayed or inadequate surgical management is consistently associated with increased mortality, greater need for limb amputation, and longer hospitalization [4]. Early, aggressive, and often repeated surgical intervention is essential to halt the progression of necrosis and systemic sepsis.

In recent years, the principles of surgical management have evolved. These include not only radical initial excision, but also scheduled re-debridement, adjunctive use of negative pressure wound therapy (NPWT), and complex reconstructive procedures during later stages of recovery [5]. Still, there is ongoing debate regarding the optimal timing, extent of surgery, and integration of reconstructive strategies, especially in patients with complex comorbidities.

This review aims to provide a comprehensive overview of the current approaches to surgical treatment of necrotizing fasciitis. Drawing upon clinical evidence, published case series, and expert consensus, the article discusses diagnostic challenges, operative strategies, adjuvant techniques, and prognostic determinants in the surgical care of patients with NF.

1. General Characteristics of Necrotizing Fasciitis

Necrotizing fasciitis (NF) is a severe soft tissue infection that primarily affects the fascia and subcutaneous fat, rapidly progressing to extensive necrosis, systemic toxicity, and, if untreated, multi-organ failure. The condition is characterized by its fulminant course and requires immediate surgical recognition and intervention [1].

1.1 Classification

Clinically and microbiologically, necrotizing fasciitis is classified into several types:

Type I (polymicrobial) is the most common form, accounting for approximately 70–80% of cases. It typically involves a synergistic combination of aerobic and anaerobic bacteria, including Enterobacteriaceae, Bacteroides spp., Peptostreptococcus, and non-group A streptococci. This variant is more frequent in elderly patients, postoperative wounds, and individuals with diabetes or peripheral vascular disease [2].

Type II (monomicrobial) is usually caused by Group A Streptococcus (GAS), either alone or in combination with Staphylococcus aureus. It tends to occur in otherwise healthy individuals and may be associated with streptococcal toxic shock syndrome (STSS) [3].

Type III is caused by Gram-negative marine organisms, such as Vibrio vulnificus and Aeromonas hydrophila, typically associated with exposure to seawater or traumatic injury in aquatic environments. This type progresses particularly rapidly and is associated with a high mortality rate [4].

Type IV, though rare, is of fungal origin, most often associated with immunocompromised patients. Fungal NF is typically caused by organisms such as Candida spp. or Zygomycetes and carries an extremely poor prognosis if not recognized early [5].

1.2 Pathophysiology

The pathogenesis of NF involves the inoculation of pathogens into deep soft tissues through a breach in the skin or mucosal barrier. This is followed by the rapid production of exotoxins, enzymes (e.g., streptolysin O, hyaluronidase, and DNases), and superantigens, which facilitate bacterial spread and massive tissue destruction. Concurrently, a severe host immune response develops, leading to cytokine storm, endothelial damage, thrombosis of the microcirculation, and widespread ischemia [6].

The disease's rapid progression is compounded by host-related risk factors, including diabetes mellitus, chronic kidney disease, malignancy, obesity, alcoholism, recent surgery, trauma, and the use of immunosuppressive medications. These comorbidities contribute both to increased susceptibility and worse outcomes [7].

1.3 Clinical Presentation

The early clinical manifestations of necrotizing fasciitis are often subtle and misleading. Initial symptoms typically include erythema, warmth, and edema in the affected area, which can easily be mistaken for uncomplicated cellulitis. However, a key distinguishing feature is the presence of intense, deep-seated pain that is markedly disproportionate to the visible clinical findings, often preceding any noticeable skin changes or systemic signs [8]. As the disease progresses, more overt and alarming signs emerge, such as skin discoloration with dusky or violaceous tones, the formation of hemorrhagic bullae, localized cutaneous anesthesia due to nerve sheath necrosis, and crepitus caused by gas-forming organisms. These local findings are frequently accompanied by systemic manifestations of sepsis, including fever, hypotension, and tachycardia. In the absence of early surgical intervention, necrotizing fasciitis rapidly evolves into septic shock and multi-organ dysfunction, significantly worsening the prognosis.

Laboratory investigations may reveal leukocytosis, markedly elevated C-reactive protein (CRP), hyponatremia, metabolic acidosis, and increased levels of creatine kinase, all of which suggest deep tissue involvement and systemic inflammation. The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score has been proposed as an adjunctive tool to facilitate early diagnosis. It integrates several of the aforementioned parameters into a numerical scale; however, its sensitivity and specificity have shown considerable variability across studies and clinical contexts, and thus it should not be solely relied upon in urgent surgical decision-making [9].

Imaging modalities such as computed tomography (CT) and magnetic resonance imaging (MRI) may assist in delineating the extent of fascial involvement, detecting soft tissue gas, and identifying fluid collections along fascial planes. Nevertheless, their utility is adjunctive and should not delay immediate surgical exploration in patients with high clinical suspicion of NF, as time-sensitive debridement remains the single most critical intervention [10].

2. Diagnosis and Its Role in Surgical Decision-Making

Timely diagnosis of necrotizing fasciitis (NF) is critical for improving patient outcomes, as delays in surgical intervention significantly increase mortality. However, early recognition remains a major clinical challenge due to the nonspecific nature of initial symptoms and the deceptive appearance of overlying skin [1].

2.1 Clinical Assessment

Clinical suspicion is the cornerstone of early diagnosis. The most characteristic feature in the early phase is pain that is disproportionate to physical findings. Other early signs may include edema beyond the area of erythema, systemic toxicity, and progression despite adequate antibiotic therapy. As the disease evolves, findings such as skin necrosis, blistering, crepitus, and anesthesia of the affected region may become evident [2].

The classic triad—severe pain, swelling, and systemic toxicity—is present in only a minority of patients in the early phase, underscoring the need for vigilance and a low threshold for surgical consultation [3].

The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score was developed as a diagnostic adjunct to aid in distinguishing necrotizing fasciitis from less aggressive soft tissue infections. It integrates six routine laboratory parameters—C-reactive protein (CRP), white blood cell count, hemoglobin concentration, serum sodium, creatinine, and blood glucose levels—into a single scoring system. A LRINEC score of 6 or more is considered suggestive of necrotizing fasciitis, while a score of 8 or higher is associated with a high probability of the disease [4]. Despite its conceptual utility, the LRINEC score has demonstrated inconsistent sensitivity and specificity across diverse clinical settings and patient populations. Consequently, it should be interpreted with caution and regarded as a supplementary rather than definitive diagnostic tool [5].

Additional laboratory abnormalities may strengthen clinical suspicion of necrotizing fasciitis. These include marked leukocytosis or, paradoxically, leukopenia in severely immunosuppressed individuals, hyponatremia defined as serum sodium levels below 135 mmol/L, elevated serum lactate reflecting tissue hypoperfusion, thrombocytopenia, and increased concentrations of inflammatory biomarkers such as procalcitonin. Although these findings are not pathognomonic, their presence in the context of rapidly progressing soft tissue infection should prompt urgent surgical evaluation.

Imaging studies may be helpful in cases of diagnostic uncertainty, particularly in patients with equivocal clinical findings. However, imaging must never delay surgical exploration in patients with a high index of suspicion, given the time-sensitive nature of the disease. Plain radiographs are occasionally able to detect soft tissue gas, but this finding is typically late and not reliably present. Ultrasonography can identify fascial fluid collections or gas bubbles but is highly operator-dependent and less sensitive in deep compartments. Computed tomography (CT) is more informative, as it can reveal fascial thickening, gas formation, and fluid tracking along fascial planes, thereby helping to map the anatomical extent of infection [6]. Magnetic resonance imaging (MRI) offers the highest sensitivity for early detection of fascial edema and necrosis; however, its use is often limited by availability, scan duration, and patient instability, which may render it impractical in urgent surgical scenarios [7].

2.4 Role of Exploratory Surgery

When NF is suspected clinically, prompt surgical exploration remains the gold standard for diagnosis and treatment. Bedside "finger test" under local anesthesia (blunt dissection of subcutaneous tissue and fascia) may reveal grayish necrotic tissue, lack of bleeding, and «dishwater» fluid. These findings are diagnostic and should prompt radical debridement [8].

Early involvement of surgical teams and initiation of exploratory fasciotomy can drastically improve survival. Waiting for confirmatory tests or imaging in the presence of systemic toxicity and local signs is associated with poor outcomes [9].

3. Principles of Surgical Management

The cornerstone of necrotizing fasciitis (NF) treatment is early, radical, and often repeated surgical debridement. No pharmacologic therapy—antibiotic or otherwise—can compensate for inadequate surgical removal of necrotic tissue. Delay in surgical intervention, even by a few hours, has been shown to significantly increase the risk of mortality [1].

3.1 Timing of Surgery

Early surgical intervention is critical. Multiple studies have demonstrated that debridement performed within 12–24 hours of hospital admission is associated with significantly lower mortality, fewer organ failures, and decreased need for limb amputation [2]. Conversely, delays beyond 24 hours double or even triple the risk of death [3].

Surgery should not be delayed for imaging, tissue culture, or specialist consultation in clinically unstable patients. «Time is fascia» has become a guiding principle in the management of NF.

The initial surgical debridement in necrotizing fasciitis must be extensive, radical, and uncompromising. The procedure should involve wide excision of all visibly necrotic, discolored, or noncontractile tissues, including the skin, subcutaneous fat, and deep fascia. It is essential that the surgeon inspect the entire length of the involved fascial planes, as necrosis often extends well beyond the apparent external margins. Debridement must extend into visibly healthy tissue to ensure complete removal of all infected and devitalized structures, as underestimation of necrotic spread is a common pitfall that leads to disease progression and worsened outcomes [4].

Several characteristic intraoperative findings support the diagnosis of necrotizing fasciitis. These include the presence of grayish, nonviable fascia, the absence of normal bleeding from the wound bed, and the appearance of so-called «dishwater» fluid—a thin, gray or brownish exudate that collects between the fascial planes. A foul odor is frequently present due to anaerobic bacterial activity, and the fascia may offer little or no resistance to blunt dissection, reflecting the extent of tissue destruction. These findings, when observed, confirm the diagnosis and demand immediate, thorough excision of affected tissues.

In many cases, particularly those involving the extremities, fasciotomy is necessary both to access deeper compartments and to relieve evolving compartment syndrome. Decompression of fascial compartments not only facilitates radical debridement but also helps prevent ischemic injury to muscle and neurovascular structures, especially in edematous limbs under rising pressure [5].

3.3 Reoperation and Staged Debridement

Given the progressive nature of NF, scheduled re-debridements every 24–48 hours are usually necessary until the wound is clean and granulating. The extent of reoperation depends on the clinical course and findings during wound evaluation [6].

Patients may require three or more surgical interventions before definitive wound control is achieved. Frequent reassessment by the surgical team is essential.

3.4 Amputation

In the context of necrotizing fasciitis, amputation may become the only life-saving intervention when local infection remains uncontrolled, tissue necrosis becomes extensive, or limb viability is irre-

versibly lost. In fulminant cases where repeated surgical debridement fails to arrest the progression of infection or when critical structures are destroyed beyond reconstruction, early amputation has been associated with improved survival outcomes [7]. The decision to amputate is clinically complex and often made under urgent conditions, typically based on several converging indicators. These include failure to respond to prior serial debridements, persistently rising serum lactate levels, progression of sepsis despite maximal supportive therapy, intraoperative identification of extensive myonecrosis or major vascular thrombosis, and involvement of joints or essential neurovascular bundles that renders the limb nonfunctional or nonviable.

Although amputation is considered a last resort, it should not be delayed in critically ill patients, as hesitation can result in further systemic deterioration and increased risk of death. When performed decisively and in a timely manner, amputation may serve not only to control the source of infection but also to stabilize the patient and allow transition to definitive care. From a surgical perspective, the decision must be guided by intraoperative findings, laboratory and hemodynamic data, and interdisciplinary consensus involving intensivists and rehabilitation specialists. While psychologically and physically devastating, especially in younger patients, prompt amputation in the appropriate clinical setting may be the single intervention that preserves life.

3.5 Operative Techniques and Adjuncts

Surgical techniques employed in the treatment of necrotizing fasciitis must carefully balance the imperative of radical tissue excision with the need to preserve vital anatomical structures and maintain the potential for future reconstructive procedures. Surgeons are often faced with the challenge of removing all necrotic and infected tissue while avoiding unnecessary sacrifice of muscles, nerves, and vascular elements critical for limb function. Intraoperative tissue cultures and biopsies are routinely obtained to guide subsequent antimicrobial therapy and to confirm histopathologic diagnosis; however, these results typically become available only after the initial surgical decisions have already been made.

Several adjunctive measures have been described in the operative management of necrotizing fasciitis. These include the use of pulsatile lavage systems to mechanically irrigate and cleanse the wound bed, enzymatic debriding agents applied selectively to facilitate removal of necrotic debris, and topical antiseptics such as povidone-iodine or polyhexanide to reduce local microbial burden. While these approaches may offer supplementary benefits in wound sanitation and healing, none of them are substitutes for thorough, sharp debridement, which remains the definitive and irreplaceable surgical modality for infection control [8].

4. Adjunctive Therapies and Reconstructive Strategies

While surgical debridement remains the central intervention in necrotizing fasciitis (NF), a combination of adjunctive therapies and timely reconstructive planning plays a crucial role in reducing morbidity and facilitating recovery. These interventions aim to optimize wound healing, prevent secondary infections, and improve functional and cosmetic outcomes.

4.1 Negative Pressure Wound Therapy (NPWT)

Negative pressure wound therapy (NPWT), also referred to as vacuum-assisted closure (VAC), has become an important adjunct in the postoperative management of necrotizing fasciitis. By applying controlled subatmospheric pressure to the wound surface, NPWT exerts multiple beneficial effects on the healing process. It stimulates angiogenesis and the proliferation of granulation tissue, reduces interstitial edema, controls wound exudate, and minimizes bacterial colonization through continuous evacuation of fluids and necrotic debris [1]. These physiological effects collectively enhance wound bed preparation and promote faster transition to definitive closure.

Clinical studies have demonstrated that the application of NPWT shortens the interval required for achieving a clean granulating wound suitable for grafting or flap coverage, reduces the frequency of painful dressing changes, and improves overall patient comfort and mobility during the recovery period [2]. Its use is particularly advantageous in the interstage period between serial debridements and during the preparatory phase leading to reconstructive interventions. Moreover, in extensive wounds where conventional dressings may be impractical or insufficient, NPWT provides a controlled and sealed environment that facilitates local wound control while systemic stabilization is ongoing.

4.2 Antibiotic Therapy and Supportive Care

Although antibiotic therapy alone is insufficient to control necrotizing fasciitis, the initiation of broad-spectrum empirical antimicrobial treatment is mandatory and should occur immediately upon clinical suspicion, even prior to definitive micro-

biological confirmation. Standard empirical regimens typically include a beta-lactam/beta-lactamase inhibitor combination, such as piperacillin–tazobactam, which provides coverage against Gram-negative and anaerobic pathogens; clindamycin, which is used to inhibit bacterial toxin production; and either vancomycin or linezolid to ensure adequate coverage against methicillin-resistant Staphylococcus aureus (MRSA) [3]. Once intraoperative cultures and susceptibility profiles become available, antibiotic regimens should be narrowed accordingly. The duration of antimicrobial therapy is determined by the patient's clinical response, but it generally extends for more than two weeks, especially in cases with extensive soft tissue involvement or delayed wound closure.

In parallel with antimicrobial treatment, comprehensive supportive care in an intensive care unit (ICU) setting is crucial for survival. Such care includes aggressive fluid resuscitation to correct hypovolemia and maintain perfusion, vasopressor support in cases of septic shock, renal replacement therapy when indicated, tight glycemic control to mitigate immune dysfunction and tissue injury, and individualized nutritional support to promote healing and preserve lean body mass. These elements form the backbone of multimodal therapy in NF and must be dynamically adjusted based on the evolving clinical status of the patient [4].

4.3 Hyperbaric Oxygen Therapy (HBOT)

Hyperbaric oxygen therapy (HBOT) has been proposed as an adjunct in selected cases. It improves tissue oxygenation, inhibits anaerobic bacterial growth, and enhances leukocyte function. Although some retrospective studies suggest a reduction in mortality and amputation rates, the evidence remains inconclusive, and HBOT is not widely available or standardized [5].

Therefore, HBOT may be considered in stable patients with access to facilities, but it should never delay surgical debridement or transfer to higher levels of care.

4.4 Reconstructive Surgery

Once infection control has been achieved and the wound is stabilized, the patient may proceed to the reconstructive phase of treatment. The optimal timing and choice of reconstructive strategy are determined by several factors, including the size and anatomical location of the defect, the depth and complexity of tissue loss, the presence or absence of exposed critical structures such as tendons, nerves, or bones, and the overall clinical status and physiological reserve of the patient. The primary goal at this stage is to achieve durable soft tissue coverage, restore function, and minimize long-term disability.

For superficial defects with a well-vascularized granulating wound bed, split-thickness skin grafts are often sufficient and widely used due to their relative simplicity and high success rate. In cases of deeper tissue loss or when essential structures are exposed, local or regional flaps—particularly muscle or fasciocutaneous flaps—may be employed to provide robust vascularized coverage. In large, complex, or anatomically sensitive defects, particularly those involving joints or weight-bearing surfaces, free tissue transfer using microsurgical techniques may be necessary to achieve both functional and aesthetic reconstruction [6].

The reconstructive phase typically requires close interdisciplinary collaboration with plastic and reconstructive surgeons to individualize the surgical plan and optimize outcomes. In patients with extremity involvement, early initiation of rehabilitation and physical therapy is critical to preserving joint mobility, preventing contractures, and facilitating return to baseline functional status. Successful reconstruction after necrotizing fasciitis not only restores tissue integrity but also significantly contributes to the patient's overall psychological and social recovery.

5. Special Considerations in High-Risk Populations

Management of necrotizing fasciitis (NF) in patients with significant comorbidities poses unique clinical challenges. Individuals with diabetes mellitus, chronic kidney disease, obesity, peripheral vascular disease, malignancy, or immunosuppression—either iatrogenic or disease-related—are at significantly increased risk for both the development and severe progression of NF [1]. In these populations, atypical clinical presentations, blunted inflammatory responses, and rapid systemic decompensation are common, often resulting in delayed diagnosis and poorer outcomes [2].

Diabetes mellitus is among the most prevalent risk factors associated with NF. Hyperglycemia impairs neutrophil function, inhibits phagocytosis, and promotes tissue ischemia through microvascular damage. Diabetic patients also frequently present with neuropathy, which may mask the early disproportionate pain typical of NF, contributing to diagnostic delay [3]. Furthermore, hyperglycemia and ketoacidosis can exacerbate systemic inflammatory responses and are independently associated with increased mortality. Effective glycemic control during both the acute and recovery phases is essential to optimize wound healing and immune function [4].

Immunocompromised patients, such as those undergoing chemotherapy, transplant recipients, and individuals with HIV/AIDS or autoimmune diseases, often present without classic signs of local inflammation. Fever, leukocytosis, and pain may be minimal or absent, necessitating a high index of suspicion. In these cases, clinicians must rely on indirect signs, laboratory abnormalities, and early surgical exploration based on clinical gestalt. The spectrum of pathogens may also shift in this group, with fungal or opportunistic infections more likely, requiring broader microbiological coverage and vigilance for rare organisms [5].

Elderly patients and those with multiple comorbidities frequently exhibit poor physiologic reserve and limited tolerance to repeated surgical trauma, general anesthesia, or sepsis-related stress. In this context, the surgical team must balance the need for radical debridement with preservation of organ function and quality of life. While standard protocols emphasize aggressive intervention, modified approaches with staged or minimally invasive access may be justified in select cases under continuous multidisciplinary supervision [6].

Special consideration must also be given to patients with vascular compromise—whether due to peripheral artery disease, previous vascular surgery, or local trauma—as tissue perfusion in these individuals is already compromised. Necrosis may evolve more rapidly, and wound healing is substantially impaired. In some cases, primary amputation may be considered earlier if perfusion is critically insufficient and limb salvage attempts would jeopardize systemic recovery [7].

Regardless of the comorbidity profile, the management of NF in high-risk patients demands early surgical intervention, intensive care support, and dynamic, individualized clinical decision-making. Risk stratification tools such as the SOFA score, APACHE II, or modified frailty indexes may assist in predicting prognosis and guiding the extent of surgical aggressiveness [8]. Importantly, outcomes in these groups are optimized not by limiting surgery, but by ensuring that surgical decisions are integrated into a coordinated multidisciplinary treatment strategy [9].

6. Prognosis and Factors Influencing Outcome

Despite advances in surgical technique, intensive care, and antimicrobial therapy, the prognosis of necrotizing fasciitis (NF) remains guarded, with mortality rates ranging from 20% to 40%, depending on the population and setting [1]. The outcome of the disease is influenced by a complex interplay of factors, including time to diagnosis, extent of necrosis, anatomical location, host immune status, and the quality of surgical and critical care provided.

Among the most decisive prognostic determinants is the timing of surgical intervention. Multiple studies have demonstrated that debridement performed within the first 12 to 24 hours of symptom onset is associated with significantly improved survival, while delays beyond this period lead to a marked increase in mortality and higher likelihood of multiorgan failure [2]. Repeated and inadequate initial debridement also correlates with adverse outcomes, highlighting the necessity of early, radical excision during the first surgical approach [3].

The extent of infection and the need for limb amputation serve both as markers of disease severity and as independent predictors of poor prognosis. Patients with involvement of deep compartments, perineal or retroperitoneal regions, or extensive trunk involvement are at particularly high risk for septic complications and prolonged hospitalization [4].

Comorbidities, especially diabetes mellitus, immunosuppression, renal failure, and liver dysfunction, are strongly associated with increased mortality. The presence of two or more significant comorbid conditions can more than double the risk of death, particularly when compounded by systemic inflammatory response syndrome (SIRS) and hemodynamic instability at presentation [5]. In patients with diabetes, impaired wound healing and persistent tissue hypoxia complicate recovery, and insulin resistance contributes to metabolic disarray that worsens the inflammatory response [6].

Several clinical scoring systems have been proposed to assess disease severity and predict outcomes. The LRINEC score, although initially designed for diagnosis, has shown limited prognostic utility. In contrast, intensive care-based systems such as SOFA (Sequential Organ Failure Assessment) and APACHE II (Acute Physiology and Chronic Health Evaluation) provide more accurate mortality risk estimation, especially in patients requiring mechanical ventilation or vasopressor support [7].

Laboratory markers such as elevated serum lactate, hypoalbuminemia, thrombocytopenia, and metabolic acidosis have all been associated with poor prognosis. In particular, serum lactate >2.0 mmol/L and persistent hypotension despite fluid resuscitation are early indicators of septic shock and tissue hypoperfusion [8].

The need for ICU admission, the number of surgical interventions, and the duration of organ support (e.g., mechanical ventilation, renal replacement therapy) are not only consequences of disease severity but also strong predictors of outcome. Survivors often endure a prolonged and resource-intensive recovery, including multi-

ple debridements, reconstructive surgeries, and rehabilitation [9].

Ultimately, the most consistent predictor of favorable outcome across all cohorts remains early diagnosis and immediate surgical action. Multidisciplinary collaboration among surgeons, intensivists, infectious disease specialists, and wound care teams is essential to guide dynamic decision-making and reduce preventable morbidity and mortality.

CONCLUSION

Necrotizing fasciitis is a surgical emergency that demands immediate clinical recognition, decisive operative management, and coordinated multidisciplinary care. Despite its relatively low incidence, the disease is associated with disproportionately high morbidity and mortality, especially in patients with comorbidities or delayed treatment. Early surgical debridement remains the single most critical intervention influencing survival. Radical excision of necrotic tissue, even when disfiguring, is often the only effective means to control the rapid spread of infection and halt systemic deterioration.

Adjunctive measures such as negative pressure wound therapy, broad-spectrum antibiotic regimens, intensive care support, and timely reconstructive procedures substantially contribute to recovery and functional restoration. The role of hyperbaric oxygen therapy and other non-surgical interventions remains supportive and should never delay surgery.

Management in high-risk populations—including patients with diabetes, immunosuppression, or advanced age—requires heightened vigilance and individualized care protocols. In these patients, standard clinical markers may be absent, and prompt surgical exploration becomes even more vital.

Ultimately, favorable outcomes in necrotizing fasciitis are not achieved through isolated interventions but through the integration of early diagnosis, aggressive surgical tactics, vigilant critical care, and thoughtful reconstruction. Continued refinement of clinical algorithms, public and professional awareness, and high-quality multicenter studies are essential to reduce the lethality of this devastating condition.

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NEKROTIZATSIYALOVCHI FASSIYIT: ZAMONAVIY KLINIK AMALIYOTDA JARROHLIK MUAMMOSI

Oxunov A.O., Erqulov A.Sh.

Toshkent davlat tibbiyot universiteti

ANNOTATSIYA

Nekrotizatsiyalovchi fassiyit (NF) – bu tez rivojlanadigan, hayot uchun xavfli yumshoq to‘qimalarning infeksiyasi bo‘lib, zudlik bilan jarrohlik aralashuvini talab qiladi. Garchi bu holat kam uchrasa ham, u o‘ta tez kechuvchi klinik manzarasi va tizimli asoratlari sababli yuqori kasallanish va o‘lim ko‘rsatkichi bilan tavsiflanadi. Mazkur sharh maqolada nekrotizatsiyalovchi fassiyitni davolashda qo‘llanilayotgan zamonaviy jarrohlik strategiyalar so‘nggi adabiyotlar asosida umumlashtiriladi. Asosiy e’tibor nekroektomiya o‘tkazish muddati va hajmiga, takroriy jarrohlik reviziyalarining o‘rni, amputatsiya mezonlariga hamda yordamchi terapiya usullariga – xususan, manfiy bosimli yara terapiyasi va rekonstruktiv amaliyotlarga qaratiladi. Shuningdek, hamroh kasalliklari, jumladan, qandli diabet va immunosupressiv holatlari bo‘lgan bemorlarda klinik qarorlar qabul qilish jarayoni tahlil qilinadi. Ushbu maqolada erta aniqlash, radikal jarrohlik taktikasi va multidissipliner yondashuvning bemor natijalarini yaxshilashdagi ahamiyati ta’kidlanadi. Mualliflar global jarrohlik tajribasi va dalillarga asoslangan tavsiyalarni tahlil qilgan holda, nekrotizatsiyalovchi fassiyitni optimal boshqarish bo‘yicha keng qamrovli tasavvurni taqdim etishga intiladi.

Kalit so‘zlar: nekrotizatsiyalovchi fassiyit; jarrohlik nekroektomiya; amputatsiya; manfiy bosimli yara terapiyasi; yumshoq to‘qimalar infeksiyasi

НЕКРОТИЗИРУЮЩИЙ ФАСЦИИТ: ХИРУРГИЧЕСКАЯ ПРОБЛЕМА В СОВРЕМЕННОЙ КЛИНИЧЕСКОЙ ПРАКТИКЕ

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АННОТАЦИЯ

Некротизирующий фасциит (НФ) — это быстро прогрессирующая, жизнеугрожающая инфекция мягких тканей, требующая немедленного хирургического вмешательства. Несмотря на редкость, заболевание сопровождается высокой заболеваемостью и летальностью из-за молниеносного течения и системных осложнений. В данном обзоре обобщены современные хирургические подходы к лечению некротизирующего фасциита на основе последних литературных данных. Особое внимание уделено срокам и объёму некрэктомии, необходимости повторных хирургических ревизий, показаниям к ампутации, а также применению вспомогательных методов, включая терапию отрицательным давлением и реконструктивные вмешательства. Также проанализированы особенности принятия клинических решений у пациентов с сопутствующими заболеваниями, включая сахарный диабет и иммунодефицитные состояния. В статье подчёркивается значение раннего распознавания, радикальной хирургической тактики и мультидисциплинарного подхода для улучшения исходов. Путём анализа международного клинического опыта и рекомендаций, основанных на доказательствах, авторы стремятся представить целостное представление об оптимальном ведении больных с некротизирующим фасциитом.

Ключевые слова: некротизирующий фасциит; хирургическая некрэктомия; ампутация; терапия отрицательным давлением; инфекция мягких тканей