

# Survival from Cervical Necrotizing Fasciitis with The Negative-Pressure Wound with Instill Therapy: A Case Report

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**Abstract:** A 53-year-old male patient was referred to the emergency room with multi-space infections lesions involving from the left mandible to the supraclavicular level. The left-sided neck progressed into significant swelling, with worsened dyspnoea and dysphagia for 5 days. Based on laboratory tests and enhanced computed tomography on neck and chest examinations, a diagnosis of cervical necrotizing fasciitis was enhanced our vigilance. Due to worsened general condition, he was transferred to the operating theatre for incision drainage under general anaesthesia. Abundant of necrotic tissue and purulent material were debrided via left lateral cervicotomy. The diagnosis of cervical necrotizing fasciitis and septic shock were made, and the patient was admitted to the Intensive Care Unit. Despite of the administration of high-level antibiotics and close dressing changes, the condition was deteriorated gradually. While a negative pressure wound therapy with install device was applied, the vital sign began to stabilize and discharged eventually. This case report presents an effective wound management via negative pressure wound therapy with install, removing exudates and neutralization of the toxins instantaneous allowed acquire a quick recovery.

**Keywords:** Cervical; Necrotizing Fasciitis; Negative Pressure Wound Therapy; Install

## 1. Introduction

Cervical necrotizing fasciitis (CNF) is a dangerous and rapidly progressing condition, associated with remarkable morbidity and mortality, that can lead to life-threatening complications without active medical intervention timely. It is characterized by extensive necrosis of subcutaneous tissue and fascia. Surgical debridement and antibiotic administration are the major therapy measures for the management of CNF.

Negative pressure wound therapy (NPWT) with instill, a useful application for the management of head and neck trauma, cutaneous fistula and so on[1], yield significant enhancement especial wound closure. Due to the distinctive contour of the head and neck making it challenging to obtain an airtight seal, its use in head and neck still rare. Herein, we report a case of severe CNF from non-odontogenic source using NPWT with instill techniques.

## 2. Clinical Data

A 53-year-old male patient was presented to the emergency department of Head and Neck Surgery, with fever, left-sided neck edema, and progress pain for 5 days. The patient was showed distress and asthenia. He denied medical history, such as diabetes mellitus and hypertension, or surgical history. Tobacco abuse more than 20years for social history. The patient had odynophagia and dysphagia. The oropharyngeal examination revealed swelling of surrounding the left tonsil. He had a cervical swelling from submandibular to supraclavicular fossa and posterior cervical triangle regions, with subcutaneous fluctuation and crepitation conspicuously.

The laboratory inspection was significant for markedly elevated Leukocyte count of 19300 with 87.8% proportion of neutrophils, and hyper-sensitive C-reactive protein and serum albumin were 253.03mg/L and 18.4g/L, respectively. Enhanced computed tomography on neck and chest showed

marked gas and fluid accumulation in from the wide range of left submaxillary, subcutaneous sternocleidomastoid, supraclavicular fossa, posterior cervical triangle and superior mediastinum, consistent with abscess formation, necrotizing fasciitis.

He underwent emergent incision and drainage 8 hours after admission, with extensive cervical debridement on the cervical musculoaponeurotic space above and peritonsillar space (Fig.1). We found a blunt dissection on these spaces without a hitch and extraction of stinking purulent liquid material about 100ml.

He was in septic shock with confessional arousal, unstable hemodynamics and admitted to the Intensive Care Unit. The diagnosis of cervical Necrotizing fasciitis, and septic shock were made, the anti-infection therapeutic regimen (imipenem, vancomycin, clindamycin) started, along with 2ug.kg.min norepinephrine raises blood pressure, mechanical respiration supplementary, and infusion of plasma to enlarge the blood capacity and improves coagulation. Initiated debridement and dressing changing bedside in sufficient analgesia sedation the first three days. However, he was got worsen present with hyperpyrexia, hypotension in spite of noradrenaline. Even then frequent debridement of necrotic tissue in the left musculi colli, rotten and abundant purulence was ceaseless drained. Given poor clearance of secretions and the torment caused by dressing changes and debridement, a NPWT with instill system was placed in the operating theater (Fig.2). The irrigation was utilizing 0.9% normal saline and vacuum suction pressure was set at -125 mmHg. He never developed fever and his vital signs began to stabilize current day.

Blood bacterial culture pre-operation and intraoperative bacterial culture of pyogenic fluids eventually yielded viridans streptococcus, which were sensitive to the second or third-generation cephalosporins. According to the drug sensitivity test, the antibiotic is adjusted to Ceftriaxone and clindamycin. Enhanced CT on cervical and chest were performed, displaying no expansion of infection (Fig.3). On the 8th day of admission to ICU, the NPWT with instill system removed and fresh granulation tissue covered the entire wound. On the 10th day of admission to ICU, he was transferred to the general ward of Head and neck surgery. He was discharged in the following thirty-one outpatient days. Wound closure was carried out with local flap (Fig.4).



*Figure1: Extensive cervical debridement and drainage performed in the left posterior cervical musculoaponeurotic space before application of NPWTi, \*represent necrotizing fasciitis.*



*Figure 2: Negative pressure wound therapy with instill system was placed. # Negative pressure area, white arrow: vacuum suction pressure was set at -125 mmHg, black arrow: normal saline for drop irrigation.*



*Figure 3: Enhanced computed tomography scan of neck (coronary) .*



*Figure 4: Wound closure was carried out after the infectious wound being controlled and stabilized.*

### 3. Conclusion

The infection types of cervical necrotizing fasciitis pertain to mixed infection, the source occurs odontogenic and upper respiratory usually. The high morbidity and mortality of CNF attribute to the complication of descending necrotizing mediastinitis and systemic septic involvement. The following clinical manifestations of edema, erythema, pain, tenderness, fever, and skin bullae or necrosis, diagnosis necrotizing fasciitis should be considered. Incremental pain is the significant clinical clue, and ahead of the manifestation of septic shock or organ dysfunction generally. However, it maybe absence due to receiving analgesic agents, altered mental status, peripheral polyneuropathy or masked by other factors[2]. In the light of the clinical characteristics of CNF, the patients could be divided into acute type, subacute type, chronic type, multiple type, island type, broad type [3].

Patients with CNF can present to the department of otorhinolaryngology head and neck or oral and maxillofacial surgery. Missed diagnosis of CNF is not uncommon due to the nonspecific initial clinical symptoms and signs. Catastrophic consequence would foreseeable as the result of doctor's vacillating in diagnosis and treatment of CNF. The risk of CNF can be predicted by The Laboratory Risk Indicator for Necrotizing Fasciitis (LRINEC) score and NLR (neutrophil to lymphocyte ratio), rapidly available predictive indicators may help in risk assessment, but the value limited [4, 5]. In addition to evaluating the extent of lesion, the lack of fascial enhancement was specific sign on enhanced computed tomographic scans and adds a significant value in diagnosis of CNF [6]. Diagnosis of CNF referred to a basic sequential time-bound treatment algorithm including clinical features, systemic signs radiographic evidence, surgery Gram's staining and culture and differential diagnosis, and final confirmed by surgical exploration [2].

In the management of complex wounds on site of head and neck, NPWT is an advantageous instrument to reduce frequent debridement and dressing changes and shorten the length of hospital stay [1, 7]. The main mechanism of NPWT to promote wound healing was well reviewed[8]. NPWT formation of high negative pressure can make the drainage area to achieve "zero retention" state, interstitial fluid moving to negative pressure zone was removed, increased local blood circulation is helpful to the growth of granulation, remove inflammatory secretions effectively and avoid disseminate into the blood stream, protect the body receives "secondary hit" maybe caused sepsis or renal failure. In recent years, successful application of NPWT in head and neck abscesses and necrotizing fasciitis have been reported[9, 10]. NPWT with instill is a refined conventional NPWT combining a syringe pipe sever the delivery of lavage fluid to the wound bed. We obtained good results by using normal saline as the lavage solution. however, the paucity of information about the choice of irrigation agents for an NPWT with instill, there is no criterion or vade mecum. NPWT with instill is a valuable method for post-treatment of neck wounds and more effective than traditional dressing techniques, but cannot

replace the primary debridement and the application of antibiotics. Based on the literature and our case, we believe that attention should be paid to the choice of lavage solution, the instillation time, soaking time, the vacuum duration time, and negative pressure in the use of NPWT with instill, and further exploration is needed in CNF. Due to distinct contour, abundant significance blood vessels and nerves on the region of Maxillofacial and neck, how to design the shape of foam to form an airtight space is challengeable that needs to be considered.

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### Competing interests

None declared.

### Ethical approval

Not required.

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