

World Journal of *Clinical Cases*

World J Clin Cases 2024 October 26; 12(30): 6335-6424



Contents

Thrice Monthly Volume 12 Number 30 October 26, 2024

EDITORIAL

- 6335 Unraveling autophagy-related pathogenesis in active ulcerative colitis: A bioinformatics approach
Hao WR, Cheng CY, Liu JC, Cheng TH
- 6339 Clinical approach for pulmonary alveolar proteinosis in children
Klubdaeng A, Tovichien P
- 6346 Rethinking Kawasaki disease diagnosis: Continuing the search for new biomarkers
Pan Y, Jiao FY
- 6349 Advances in the diagnosis and treatment of heterotopic pancreas
Lang L, Yu FK, Kang LM
- 6353 Global strategy for prevention of gastric cancer
Kotelevets SM
- 6358 Enhancing ulcerative colitis treatment with traditional Chinese medicine
Hao WR, Cheng CY, Cheng TH

MINIREVIEWS

- 6361 Overview of emerging therapies for demyelinating diseases
Medina R, Derias AM, Lakdawala M, Speakman S, Lucke-Wold B

ORIGINAL ARTICLE

Retrospective Study

- 6374 Hematological picture of pediatric Sudanese patients with visceral leishmaniasis and prediction of leishmania donovani parasite load
Elnoor ZIA, Abdelmajeed O, Mustafa A, Gasim T, Musa SAM, Abdelmoneim AH, Omer IIA, Fadl HAO
- 6383 Deep neck infections mortal complications: Intrathoracic complications and necrotising fasciitis
Bal KK, Aslan C, Gür H, Bal ST, Ustun RO, Unal M

Clinical and Translational Research

- 6391 Functional investigation and two-sample Mendelian randomization study of primary biliary cholangitis hub genes
Yang YC, Ma X, Zhou C, Xu N, Ding D, Ma ZZ, Zhou L, Cui PY

LETTER TO THE EDITOR

- 6407** Additional comments on foot reflexology treatment for sensorineural hearing loss in infant
Zhang Y, Pei H, He BJ
- 6410** Beyond the imaging evaluation of fractures of the lateral process of the talus: Let's not forget concomitant injuries
Lindner C, Reyes P, Molina E, Olave A
- 6413** Percutaneous transhepatic cholangiography: An effective option for endo-biliary radiofrequency ablation before stent insertion in unresectable biliary cancer?
Karagiannakis DS
- 6417** Clinical characteristics of renal anastomotic hemangioma
Huang K
- 6420** Addressing mucosal ulcers during orthodontic treatment: An urgent call for preventive strategies
Ardila CM

ABOUT COVER

Peer Reviewer of *World Journal of Clinical Cases*, Yao Christian Hugues Dokponou, MD, Department of Neurosurgery of Mohammed V Military Teaching Hospital, Rabat 10000, Morocco. dokponou2407@gmail.com

AIMS AND SCOPE

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING

The WJCC is now abstracted and indexed in PubMed, PubMed Central, *Reference Citation Analysis*, China Science and Technology Journal Database, and Superstar Journals Database. The 2024 Edition of Journal Citation Reports® cites the 2023 journal impact factor (JIF) for WJCC as 1.0; JIF without journal self cites: 0.9; 5-year JIF: 1.1; JIF Rank: 168/325 in medicine, general and internal; JIF Quartile: Q3; and 5-year JIF Quartile: Q3.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Zi-Hang Xu, Production Department Director: Xu Guo, Cover Editor: Jin-Li Wang.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Bao-Gan Peng, Salim Surani, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

October 26, 2024

COPYRIGHT

© 2024 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Retrospective Study

Deep neck infections mortal complications: Intrathoracic complications and necrotising fasciitis

Kemal Koray Bal, Can Aslan, Harun Gür, Seda Turk Bal, Recep Okan Ustun, Murat Unal

Specialty type: Medicine, research and experimental

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's classification

Scientific Quality: Grade C

Novelty: Grade B

Creativity or Innovation: Grade B

Scientific Significance: Grade B

P-Reviewer: Jin S

Received: April 26, 2024

Revised: July 26, 2024

Accepted: August 22, 2024

Published online: October 26, 2024

Processing time: 130 Days and 8.1 Hours



Kemal Koray Bal, Can Aslan, Harun Gür, Murat Unal, Department of Otorhinolaryngology, Mersin University, Mersin 33160, Türkiye

Seda Turk Bal, Department of Emergency Medicine, Tarsus State Hospital, Mersin 33460, Türkiye

Recep Okan Ustun, Department of Aesthetic, Division of Plastic and Reconstructive Surgery, University of Health Sciences Mersin City Hospital, Mersin 33230, Türkiye

Corresponding author: Kemal Koray Bal, MD, Assistant Professor, Department of Otorhinolaryngology, Mersin University, Çiftlikköy/Yenişehir/Mersin, Mersin 33160, Türkiye.
dr.kemalkoraybal@gmail.com

Abstract

BACKGROUND

We planned this study considering that complications of deep neck infections can be seriously life threatening.

AIM

To raise awareness that introthoracic complications and necrotizing fasciitis are causes of serious mortality and morbidity.

METHODS

This study was carried out with the participation of 188 patients who were treated at Mersin University Department of Otorhinolaryngology and Head and Neck Surgery at January 1, 2024. When the patient files were retrospectively examined, 16 of 188 patients (8.5%) were included in the study because they were observed to have necrotizing fasciitis and/or intrathoracic complications.

RESULTS

There were a total of 16 patients in this study, 9 males (56.25%) and 7 females (43.75%). All patients were adults (> 18 years) and the mean age was 50.37 years \pm 15.37 years. Female patients had a mean age of 40.42 years \pm 13.38 years, whereas for male patients was 58.11 years \pm 12.44 years.

CONCLUSION

Patients with necrotizing fasciitis and/or intrathoracic complications require more complicated and serious surgeries, intensive care unit monitoring, and mechanical ventilator support. Higher rates of morbidity and mortality should be expected in

these patients who are hospitalized for longer periods of time.

Key Words: Deep neck infection; Necrotising fasciitis; Mediastinitis; Complications; Mortality

©The Author(s) 2024. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Intrathoracic complications and necrotizing fasciitis are feared serious complications of deep neck infections. The need for aggressive surgery and long term hospitalization make this disease important. Emergency Medicine Specialists and Otolaryngologists should know the management and possible complications of these patients well and act quickly.

Citation: Bal KK, Aslan C, Gür H, Bal ST, Ustun RO, Unal M. Deep neck infections mortal complications: Intrathoracic complications and necrotising fasciitis. *World J Clin Cases* 2024; 12(30): 6383-6390

URL: <https://www.wjgnet.com/2307-8960/full/v12/i30/6383.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v12.i30.6383>

INTRODUCTION

Deep neck infections (DNIs) were first described by Galen in the second century[1]. DNIs are infections of cervical fascias and potential anatomical cervical spaces that can clinically vary from cellulitis/phlegmon to gross abscesses. The frequency of DNIs has decreased with the widespread use of antibiotics. However, owing to diagnosis and treatment delays, they can spread rapidly in the neck and mediastinum through the cervical spaces and cause various complications that result in serious morbidity and mortality. These complications include airway obstruction, necrotizing fasciitis, mediastinitis, pulmonary emphysema, pleural effusion, pericarditis, Lemierre syndrome, major artery/vein rupture, and sepsis[2]. Currently, the most common etiology of DNIs in adults is odontogenic infections, whereas the most common cause in the pediatric age group is tonsillopharyngitis. Lymphadenitis, salivary gland infections (sialadenitis and sialolithiasis), trauma, foreign bodies, invasive medical procedures (iatrogenic), intravenous drug use and addiction, congenital cysts, thyroiditis, and laryngoceles are other etiological causes. In addition, systemic diseases such as tuberculosis, cat scratch disease, toxoplasmosis, acquired immunodeficiency syndrome (AIDS), actinomycosis, syphilis, tularemia, brucellosis, Kawasaki disease, Kikuchi-Fujimoto disease, sarcoidosis, rheumatoid arthritis, and systemic lupus erythematosus are included in the etiology because they can cause suppurative lymphadenitis. However, the etiological cause cannot be determined in 20%-50% of patients[3-6].

Symptoms and signs vary according to disease progression and the site of involvement. The most common symptoms are pain, fever, and neck swelling and redness. In addition, heat increase, dysphagia, odynophagia, dyspnea, stridor, dysphonia, limited neck movements (torticollis), trismus, and crepitation may also be observed depending on the location of the infection. Loss of appetite, restlessness, and fatigue may also be observed in pediatric patients[6-9]. Although *Streptococcus* species and *Staphylococcus aureus* are the most common pathogens in microbiological examination of samples taken from DNIs patients, DNIs are generally multimicrobial infections. Aerobic pathogens are common; however, since anaerobic bacteria are difficult to grow in culture, they cause infection at a higher rate than reported[10-12]. In addition to anamnesis and physical examination, laboratory tests, ultrasonography, computed tomography (CT), magnetic resonance imaging, arteriography, and aspiration or puncture can be used to diagnose DNIs[13]. In the treatment of DNIs, combined medical antibiotic treatment and surgical drainage/debridement are the main modalities that ensure airway safety[6,7].

In this study, we aimed to retrospectively examine our patients who presented to our clinic in the last decade with intrathoracic complications and/or necrotizing fasciitis due to DNIs in terms of epidemiology, etiology, diagnosis and treatment methods, and postoperative follow-up, in light of the current literature.

MATERIALS AND METHODS

This retrospective study included 16 patients who were hospitalized at the Department of Otolaryngology and Head and Neck Surgery, University of Mersin, at January 1, 2024, for necrotizing fasciitis and/or intrathoracic complications such as mediastinitis due to DNIs. Of the 188 patients who applied within 10 years, 172 were excluded because they did not have necrotizing fasciitis and/or mediastinitis (16 of 188 DNIs patients have necrotizing fasciitis and/or mediastinitis, 8.5%). This study was approved by the University of Mersin Clinical Research Ethics Committee (date: July 24, 2024, decision number: 703). All patients provided written and verbal informed consent for the publication of the details and images.

Evaluation

Hospitalized patients who underwent surgical and medical treatments were included in the study. Demographics, complaints, medical history, clinical symptoms and findings, preoperative CT scans and intraoperative photographs,

bacterial culture results, antibiotics and their revision records, hospitalization time, infection etiology, affected cervical spaces, need for mechanical ventilation and intensive care unit admission, and postoperative follow-up were recorded for each patient. Patients who did not have necrotizing fasciitis and/or mediastinitis, were under the age of 18 years, had incomplete data, or were not hospitalized in the Otolaryngology Department were excluded from the study.

Statistical analysis

We examined the records of our hospital's information processing automation system and archive unit. The patients and applications for the same disease conditions were examined individually. These factors were considered in this study. Statistically, the *P* value was not calculated. All given values are arithmetic mathematical values. No biostatistical software program was used.

RESULTS

Demographic

In total, 16 patients were included in this study: 9 men (56.25%) and 7 women (43.75%). All patients were adults (> 18 years), and the mean age was 50.37 years \pm 15.37 years. Female patients had a mean age of 40.42 years \pm 13.38 years, whereas for male patients, the mean age was 58.11 years \pm 12.44 years.

Additional diseases

While three (18.75%) patients had no comorbidities, 13 (81.25%) had comorbidities. The most common comorbid disease was diabetes mellitus (62.5%). Hypertension and chronic ischemic heart disease were the second and third most common comorbidities, respectively.

Clinical findings and treatment

All patients underwent preoperative contrast-enhanced neck and thoracic CT. The most common finding on physical examination was pain (87.5%), followed by fever (68.75%) and dysphagia (62.5%). Other findings included dyspnea, neck crepitation, and neck enlargement. In all the patients, more than one neck region was involved. The most frequently affected regions were submandibular (81.25%), parapharyngeal (62.5%), and retropharyngeal (31.25%) regions, respectively. Two patients had an infection in the posterocervical region, and one patient had an infection in the supraclavicular region. The etiology was odontogenic in 11 (68.75%) patients, tonsillitis in two (12.5%) patients, skin infection in two (12.5%) patients, and no etiology could be found in one (6.25%) patient. While isolated necrotizing fasciitis was present in 15 patients, additional intrathoracic complications were observed in five patients. Intrathoracic complications without necrotizing fasciitis occurred in only one patient. The most common intrathoracic complications were mediastinitis and pleural effusion. The patients with intrathoracic complications underwent video-assisted thoracoscopic surgery (VATS), thoracotomy, and neck exploration. While VATS was performed in one patient, classical thoracotomy was conducted in four patients. A thoracic tube was inserted in these five patients in the same session.

In hospital

The average hospitalization time of the patients was 22.31 days \pm 12.57 days. Twelve patients (75%) were followed in intensive care. Postoperative mechanical ventilation was required in four of these patients (33.3%). The average length of stay in the intensive care was 12.75 days \pm 6.12 days. Tracheotomy was performed in five of the patients (31.25%). One patient (6.25%) died on postoperative day 5. This patient had necrotizing fasciitis with no intrathoracic complications.

Bacterial growth was observed in tissue and abscess cultures of 11 patients. Two patients harbored more than one pathogen: methicillin-sensitive coagulase-negative *Staphylococcus* in five patients (45.45%), methicillin-resistant *Staphylococcus aureus* in three patients (27.27%), *Streptococcus viridans* in one patient (9.09%), *Escherichia coli* in one patient (9.09%), and *Enterococcus* in one patient (9.09%).

Antibiotic treatment was revised in eight (50%) patients during follow-up. While necrotizing fasciitis patients were subjected to daily wound debridement under local anesthesia, one of our patients (6.25%) required re-exploration under general anesthesia. In all patients, intravenous empirical antibiotic and surgical treatments were combined. Four patients (25%) additionally received hyperbaric oxygen therapy during postoperative follow-up. Skin grafting was performed on five patients with skin and tissue defects by plastic and reconstructive surgeons during the postoperative period. Patients were routinely administered oral amoxicillin, clavunate, or cefdinir for 10-14 days after discharge.

Demonstration

The patients' preoperative, intraoperative, and postoperative images and tomography sections are shown in Figures 1, 2, 3, 4, 5 and 6, and a striking intraoperative video (Video) has been added.

DISCUSSION

DNIs are infective conditions of the cervical fascias and anatomical potential spaces formed by these fascias. DNIs and their complications are more common in men than in women (male/female ratio 1.77-1.3:1)[12]. In our study, the male/

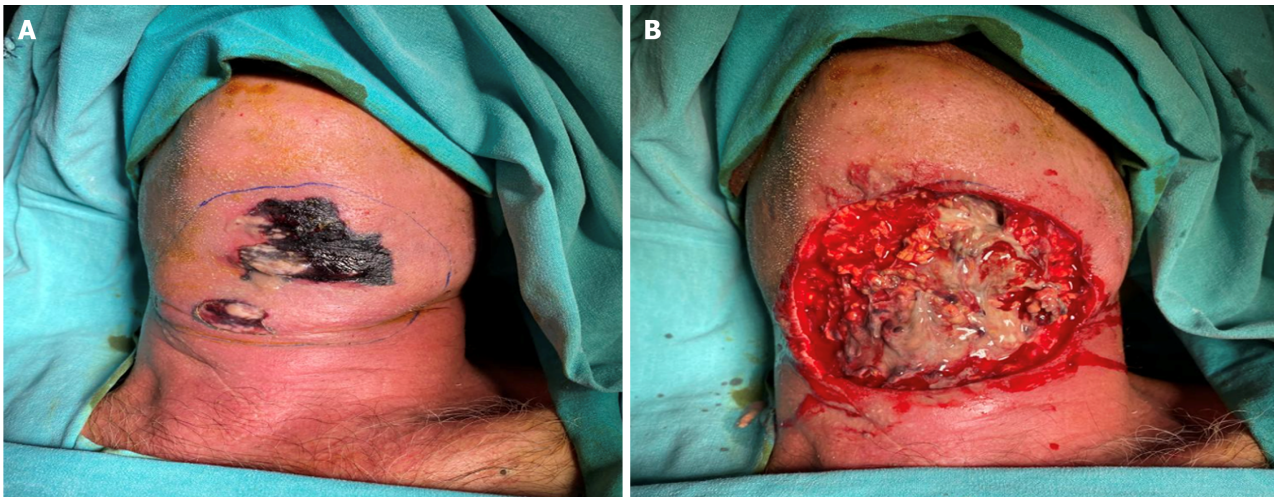


Figure 1 Image of necrotising fasciitis patient. A: Preoperative image; B: Intraoperative image.



Figure 2 Neck swelling and hyperemia in a deep neck infection patient.



Figure 3 Contrast enhanced neck and thorax computed tomography scans in axial plane. A: Submandibular and parapharyngeal abscess; B: Cervical necrotising fasciitis; C: Mediastinitis and pleural effusion.

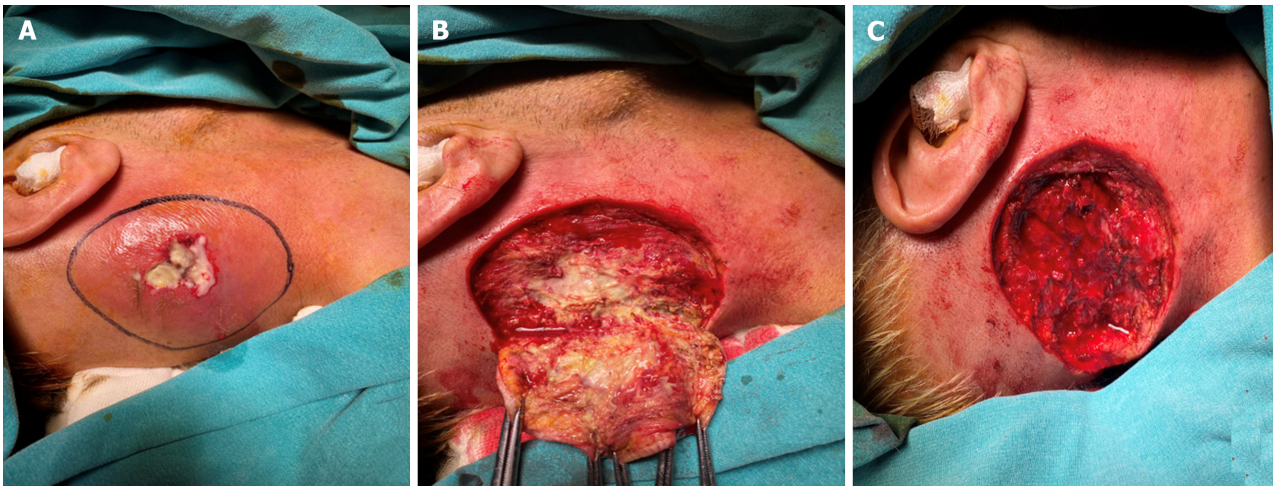


Figure 4 Necrotising fasciitis in postero-cervical region. A: Preoperative image; B: Intraoperative image; C: Postoperative image.

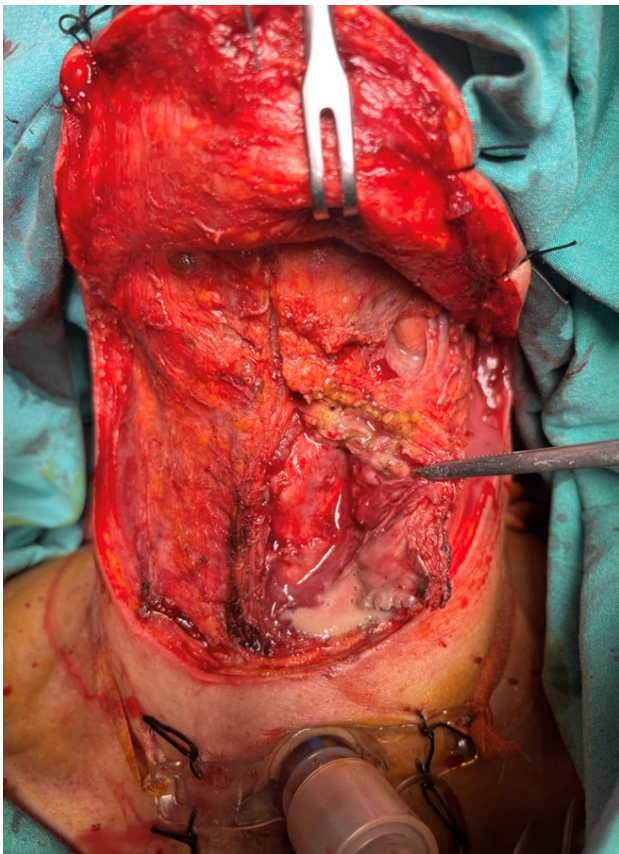


Figure 5 Surgical debridement and tracheotomy due to necrotising fasciitis.

female ratio was 1.28:1, similar to that reported in the literature.

In the absence of broad-spectrum antibiotics, DNIs are most commonly caused by tonsillopharyngitis and upper respiratory tract infections and more frequently develop within the parapharyngeal area. The prevalence of tonsillopharyngitis-induced DNIs has decreased because of the widespread use of antibiotics in the early period. Currently, DNIs mostly develop in the submandibular area because of odontogenic infections. Tonsillopharyngitis is the most common cause in children[12,14-16].

All the patients in our study were adults, and the most common etiological factor was odontogenic infection (68.75%). Diabetes mellitus is the most common comorbidity in the literature[6,14]. In our study, in accordance with the literature, DM was the most common comorbid disease (62.5%); hypertension and chronic ischemic heart disease were other common comorbid diseases.

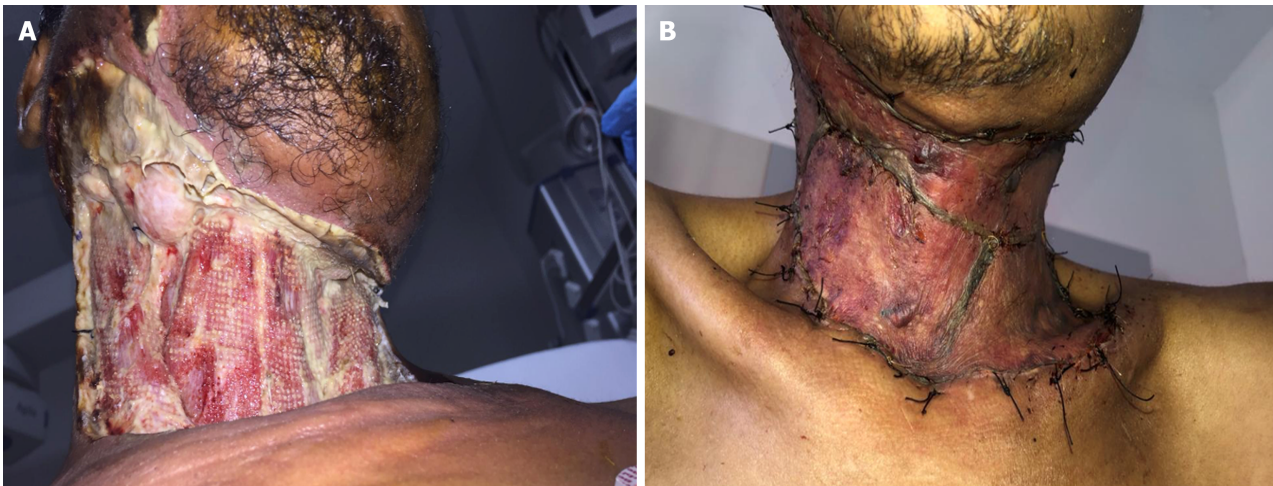


Figure 6 Necrotising fasciitis patient, skin grafting after surgical debridement. A: After surgical debridement; B: After skin grafting.

In Adoviča *et al*'s study in 36.2% of the patients and Treviño-Gonzalez *et al*'s study in 76% of the patients, the submandibular region was the most affected area[12,17]. In our study, the most affected region was the submandibular region (81.25%), consistent with previous findings.

Early diagnosis and treatment are important for the prognosis of DNIs. Once airway safety is ensured, surgical drainage/debridement and broad-spectrum antibiotics are the primary treatment modalities. Preoperative contrast-enhanced neck and thoracic CT is important for the diagnosis of complications and surgical planning. Detection of the causative pathogen in culture and revision of empirical treatment are crucial for the treatment and course of the disease [10-12]. In our clinical practice, we routinely request contrast-enhanced CT of the neck and thoracic sections, including the upper mediastinum, for all cases with suspicious clinical, laboratory, or physical examination findings. We strongly recommend that all clinicians dealing with DNIs cases routinely request neck-limited thoracic (including the upper mediastinum) CT and, in case of doubt, imaging of the entire thorax.

DNIs are polymicrobial, and the most common pathogens are staphylococci and streptococci[12,14,17,18]. Combined with surgery, broad-spectrum empiric systemic antibiotic treatment that is effective against aerobic and anaerobic bacteria is essential for the treatment of DNIs. Currently, combinations of ampicillin-sulbactam, metronidazole, and third-generation cephalosporins are most commonly used in systemic empiric antibiotic treatment[12,14-16]. DNIs spread rapidly into the neck and mediastinum through the cervical cavities, causing various complications that can lead to serious morbidity and mortality. Complications include airway obstruction, necrotizing fasciitis, mediastinitis, pulmonary emphysema, pleural effusion, pericarditis, Lemierre syndrome, major artery/vein rupture, and sepsis. In patients who develop complications, the need for surgery, duration of hospitalization and intensive care unit stay, morbidity, and mortality increase[19-22]. In a study by Treviño-Gonzalez *et al*[17], the average hospitalization period in patients with DNIs was 8.55 days, while it was 27 days in patients who developed complications. In Ban *et al*'s study, tracheotomy was performed in 32.9% of DNIs patients, and this rate was 9.2% in Crespo *et al*'s study[20,23]. The mortality rate of uncomplicated DNIs is 1%-12% but is 10%-40% in patients who develop necrotizing fasciitis and mediastinitis[19-22]. Rapid and radical surgical debridement is important in patients with necrotizing fasciitis. Although an average of three debridements is performed per patient, we perform a large number of debridements in our clinical practice. In line with the literature, we believe that it is beneficial to keep in mind the option of elective tracheotomy in the first session in patients whose repeated debridement is anticipated to be performed under general anesthesia. We use povidone-iodine, hydrogen peroxide, warm saline, and boric acid in powder form for wound cleaning and care after debridement. Repetitive debridement and curettage of necrotic tissues, antibiotic selection compatible with broad-spectrum bacterial culture, and simultaneous hyperbaric oxygen therapy have become indisputable treatment modalities for this patient group[22]. We believe that boric acid in the powder form is beneficial because it creates a suitable granulation ground for skin grafts to be applied in subsequent sessions.

The mortality risk of descending mediastinitis is high and is more fatal in adults than in children. Aggressive treatment is essential, regardless of age. Transthoracic and thoracoscopic methods are preferred for mediastinitis treatment. If left untreated, the mortality rate of mediastinitis is 85%. More than 50% of cases of descending necrotizing fasciitis (DNM) are odontogenic. Poor oral hygiene, diabetes, AIDS, intravenous drug abuse, and chronic alcoholism are predisposing factors for DNM. According to the classification of mediastinitis by Endo *et al*[20], the surgical options include transcervical drainage, subxiphoidal mediastinal drainage without sternotomy, and classical thoracotomy. Guan *et al*[24] created a DNM classification system. The authors also mentioned transcervical mediastinal drainage, infraxiphoid thoracoscopy, VATS, and classical thoracotomy. In the common opinion of the authors, VATS is an excellent option for the treatment of early-stage DNM[24-27]. The VATS rate in our DNM cases (some of our patients had additional problems such as pneumonia-pleural effusion-empyema) was 20%. The reason why we performed surgery with classical thoracotomy in 80% of our patients was that Type IIb and Type 3 cases took up more space in our case series, and most of our patients were not considered early-stage DNM and could not benefit from VATS.

In our study, the average hospitalization time was 22.31 days \pm 12.57 days. Twelve patients (75%) were followed in intensive care, four of whom (33.3%) required postoperative mechanical ventilation. The average length of stay in intensive care was 12.75 days \pm 6.12 days. Tracheotomy was performed in five of the patients (31.25%). One of our patients died in the postoperative period (6.25%). Consistent with the literature, staphylococci and streptococci were the most common pathogens. Antibiotic treatment was revised in eight patients (50%) during follow-up.

CONCLUSION

DNIs are one of the otolaryngology emergencies and a serious public health problem by causing high mortality and morbidity. Ensuring airway safety is the first principle of the treatment. Patients with necrotising fasciitis and/or intrathoracic complications need more complicated surgeries, intensive care and mechanic ventilation, have a higher morbidity-mortality and longer hospitalisation period. Because of that; early diagnosis, aggressive surgical treatment and medical management contribute to improved survival.

FOOTNOTES

Author contributions: Bal KK, Gur H, Aslan C, Bal ST, Ustun RO, and Unal M were responsible for conception, design, data collection, analysis, and drafting; all authors have read and approved the final manuscript.

Institutional review board statement: An application was made to our university's ethics committee for our study (Date: 24.07.2024, Decision Number: 703).

Informed consent statement: Written and verbal consents were obtained from all patients.

Conflict-of-interest statement: There is no conflict of interest regarding our work.

Data sharing statement: No additional data are available.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

Country of origin: Türkiye

ORCID number: Kemal Koray Bal 0000-0002-2000-0601; Can Aslan 0000-0003-0075-2061; Harun Gür 0000-0001-6165-2350; Seda Turk Bal 0000-0003-0366-1608; Recep Okan Ustun 0000-0001-7510-008X; Murat Unal 0000-0002-5524-9175.

S-Editor: Luo ML

L-Editor: A

P-Editor: Cai YX

REFERENCES

- Chen MK, Wen YS, Chang CC, Huang MT, Hsiao HC. Predisposing factors of life-threatening deep neck infection: logistic regression analysis of 214 cases. *J Otolaryngol* 1998; **27**: 141-144 [PMID: 9664243]
- Cordesmeyer R, Kauffmann P, Markus T, Sömmmer C, Eiffert H, Bremmer F, Laskawi R. Bacterial and histopathological findings in deep head and neck infections: a retrospective analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol* 2017; **124**: 11-15 [PMID: 28411005 DOI: 10.1016/j.oooo.2017.02.003]
- Yang SW, Chen TM, Chen TA. Migrating fish bone complicating a deep neck abscess. *Chang Gung Med J* 2005; **28**: 872-875 [PMID: 16515022]
- Ungkanont K, Yellon RF, Weissman JL, Casselbrant ML, González-Valdepeña H, Bluestone CD. Head and neck space infections in infants and children. *Otolaryngol Head Neck Surg* 1995; **112**: 375-382 [PMID: 7870436 DOI: 10.1016/S0194-59989570270-9]
- Plaza Mayor G, Martínez-San Millán J, Martínez-Vidal A. Is conservative treatment of deep neck space infections appropriate? *Head Neck* 2001; **23**: 126-133 [PMID: 11303629 DOI: 10.1002/1097-0347(200102)23:2<126::aid-hed1007>3.0.co;2-n]
- Bal KK, Unal M, Delialioglu N, Oztornaci RO, Ismi O, Vayisoglu Y. Diagnostic and therapeutic approaches in deep neck infections: an analysis of 74 consecutive patients. *Braz J Otorhinolaryngol* 2022; **88**: 511-522 [PMID: 32868223 DOI: 10.1016/j.bjorl.2020.07.002]
- Gidley PW, Ghorayeb BY, Stiernberg CM. Contemporary management of deep neck space infections. *Otolaryngol Head Neck Surg* 1997; **116**: 16-22 [PMID: 9018251 DOI: 10.1016/s0194-59989770345-0]
- Har-El G, Aroesty JH, Shaha A, Lucente FE. Changing trends in deep neck abscess. A retrospective study of 110 patients. *Oral Surg Oral Med Oral Pathol* 1994; **77**: 446-450 [PMID: 8028865 DOI: 10.1016/0030-4220(94)90221-6]
- Tom MB, Rice DH. Presentation and management of neck abscess: a retrospective analysis. *Laryngoscope* 1988; **98**: 877-880 [PMID: 3398666 DOI: 10.1288/00005537-198808000-00017]

- 10 **Martínez Pascual P**, Pinacho Martinez P, Friedlander E, Martin Oviedo C, Scola Yurrita B. Peritonsillar and deep neck infections: a review of 330 cases. *Braz J Otorhinolaryngol* 2018; **84**: 305-310 [PMID: [28442374](#) DOI: [10.1016/j.bjorl.2017.03.008](#)]
- 11 **Shimizu Y**, Hidaka H, Ozawa D, Kakuta R, Nomura K, Yano H, Watanabe KI, Katori Y. Clinical and bacteriological differences of deep neck infection in pediatric and adult patients: Review of 123 cases. *Int J Pediatr Otorhinolaryngol* 2017; **99**: 95-99 [PMID: [28688574](#) DOI: [10.1016/j.ijporl.2017.05.028](#)]
- 12 **Adoviča A**, Veidere L, Ronis M, Sumeraga G. Deep neck infections: review of 263 cases. *Otolaryngol Pol* 2017; **71**: 37-42 [PMID: [29154249](#) DOI: [10.5604/01.3001.0010.5315](#)]
- 13 **Nagy M**, Backstrom J. Comparison of the sensitivity of lateral neck radiographs and computed tomography scanning in pediatric deep-neck infections. *Laryngoscope* 1999; **109**: 775-779 [PMID: [10334229](#) DOI: [10.1097/00005537-199905000-00017](#)]
- 14 **Bakir S**, Tanriverdi MH, Gün R, Yorgancilar AE, Yildirim M, Tekbaş G, Palanci Y, Meriç K, Topçu I. Deep neck space infections: a retrospective review of 173 cases. *Am J Otolaryngol* 2012; **33**: 56-63 [PMID: [21414684](#) DOI: [10.1016/j.amjoto.2011.01.003](#)]
- 15 **Kataria G**, Saxena A, Bhagat S, Singh B, Goyal I, Vijayvergia S, Sachdeva P. Prevalence of odontogenic deep neck space infections (DNSI): a retrospective analysis of 76 cases of DNSI. *Int J Otorhinolaryngol Head Neck Surg* 2015; **1**: 11 [DOI: [10.18203/issn.2454-5929.ijohns20150580](#)]
- 16 **Doležalová H**, Zemek J, Tuček L. Deep Neck infections of Odontogenic Origin and Their Clinical Significance. A Retrospective Study from Hradec Králové, Czech Republic. *Acta Medica (Hradec Kralove)* 2015; **58**: 86-91 [PMID: [26686948](#) DOI: [10.14712/18059694.2015.98](#)]
- 17 **Treviño-Gonzalez JL**, Maldonado-Chapa F, González-Larios A, Morales-Del Angel JA, Soto-Galindo GA, Zafiro García-Villanueva JM. Deep Neck Infections: Demographic and Clinical Factors Associated with Poor Outcomes. *ORL J Otorhinolaryngol Relat Spec* 2022; **84**: 130-138 [PMID: [34237752](#) DOI: [10.1159/000517026](#)]
- 18 **Çetin AÇ**, Olgun Y, Özses A, Erdağ TK. A New Trend in the Management of Pediatric Deep Neck Abscess: Achievement of the Medical Treatment Alone. *Turk Arch Otorhinolaryngol* 2017; **55**: 57-63 [PMID: [29392056](#) DOI: [10.5152/tao.2017.2181](#)]
- 19 **Boscolo-Rizzo P**, Stellin M, Muzzi E, Mantovani M, Fuson R, Lupato V, Trabalzini F, Da Mosto MC. Deep neck infections: a study of 365 cases highlighting recommendations for management and treatment. *Eur Arch Otorhinolaryngol* 2012; **269**: 1241-1249 [PMID: [21915755](#) DOI: [10.1007/s00405-011-1761-1](#)]
- 20 **Crespo AN**, Chone CT, Fonseca AS, Montenegro MC, Pereira R, Milani JA. Clinical versus computed tomography evaluation in the diagnosis and management of deep neck infection. *Sao Paulo Med J* 2004; **122**: 259-263 [PMID: [15692720](#) DOI: [10.1590/s1516-31802004000600006](#)]
- 21 **Prabhu SR**, Nirmalkumar ES. Acute Fascial Space Infections of the Neck: 1034 cases in 17 years follow up. *Ann Maxillofac Surg* 2019; **9**: 118-123 [PMID: [31293939](#) DOI: [10.4103/ams.ams_251_18](#)]
- 22 **Gunaratne DA**, Tseros EA, Hasan Z, Kudpaje AS, Suruliraj A, Smith MC, Riffat F, Palme CE. Cervical necrotizing fasciitis: Systematic review and analysis of 1235 reported cases from the literature. *Head Neck* 2018; **40**: 2094-2102 [PMID: [29934952](#) DOI: [10.1002/hed.25184](#)]
- 23 **Ban MJ**, Jung JY, Kim JW, Park KN, Lee SW, Koh YW, Park JH. A clinical prediction score to determine surgical drainage of deep neck infection: A retrospective case-control study. *Int J Surg* 2018; **52**: 131-135 [PMID: [29455048](#) DOI: [10.1016/j.ijssu.2018.02.024](#)]
- 24 **Guan X**, Liang X, Liang X, Wang F, Qian W, Zhang W. A new classification of descending necrotizing mediastinitis and surgical strategies. *Ann Transl Med* 2021; **9**: 356 [PMID: [33708983](#) DOI: [10.21037/atm-21-121](#)]
- 25 **Hu CY**, Lien KH, Chen SL, Chan KC. Risk Factors of Descending Necrotizing Mediastinitis in Deep Neck Abscesses. *Medicina (Kaunas)* 2022; **58**: 1758 [PMID: [36556959](#) DOI: [10.3390/medicina58121758](#)]
- 26 **Endo S**, Murayama F, Hasegawa T, Yamamoto S, Yamaguchi T, Sohara Y, Fuse K, Miyata M, Nishino H. Guideline of surgical management based on diffusion of descending necrotizing mediastinitis. *Jpn J Thorac Cardiovasc Surg* 1999; **47**: 14-19 [PMID: [10077888](#) DOI: [10.1007/BF03217934](#)]
- 27 **Weiner KAS**, Rieger CC, Wohl DL, Harley EH. Retropharyngeal Abscess With Mediastinal Extension: A Case Series and Review of the Literature. *Ear Nose Throat J* 2023; **102**: 580-583 [PMID: [37309202](#) DOI: [10.1177/01455613231178975](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: office@baishideng.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

