



Case Report

The Management of Deep Neck Abscess Comorbids with Kidney Failure

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Abstract

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Background : Deep neck abscess is a life threatening disease as its complications. Some comorbidities affect the successful management of deep neck abscess. Kidney failure is one of comorbidities causing uremia which in turn affecting imbalance of pro and anti inflammatory mediators. This study was aimed to describe the proper management of deep neck abscess comorbids with kidney failure.

Case report : To report series of deep neck abscess comorbids with kidney failure being administered therapies with various outcomes.

Methods : Evidence based – literature review about deep neck abscess comorbids with kidney failure was conducted in *Pubmed*, *Clinical Key*, and *Google Scholar*. Retrieved articles were then critically appraised.

Results : Three evidence based-articles meeting criteria were included. The management of neck abscess comorbids with renal failure starts from kidney management according to Kidney disease: Improving Global Outcome (KDIGO) year 2012, and followed by management of deep neck abscess except in emergency situation. Diagnose and management of kidney disease need series examination of serume creatinine and urine monitoring.

Conclusion : The management of deep neck abscess comorbids with kidney failure commences with therapy for renal failure followed by management of deep neck abscess.

Keywords : deep neck abscess, kidney failure, comorbid

INTRODUCTION

Deep neck abscess is an abscess formed in a potential space in the deep neck.¹ A study by Chang *et al.* in Taiwan shows that of 127.283 patients with kidney failure, 280 patients experience deep neck abscess (0.1%).² In developing countries, incidence of deep neck absces is high. A study by Irmanto at Hasan Sadikin hospital in 2012 found 28 cases of deep neck abscess.³ The successfull management of deep neck abscess is influenced by many factors involving diabetes melitus, hypertension, autoimmune disease, and kidney failure.²

Severe inflammation worsens kidney impairment through pathophysiological processes including damage associated molecular pattern molecules (DAMPs)/ pathogen associated molecular patterns (PAMPs) recognized by immune cells, epithelial cells and parenchymal cells through interaction with receptors such as monocyte spreading and TLR-4 integrin expression forming reactive oxygen species (ROS) in basal cells. Increased ROS production and chemokine expression escalates proinflammatory activities from low density lipoprotein (LDL) and decreases anti inflammatory activities from high density lipoprotein (HDL) and endogenous antioxidants, anti inflammatory and cytoprotective system. Oxydative stress caused by substances or enzymes stimulated by inflammatory mediators induces apoptosis of endothelial cells and kidney tubules.⁴ This study aims to present case series of deep neck abscesses comorbid with kidney failure and to review its management from selected articles to foster understanding related to best management of deep neck abscess comorbids with renal failure.

CASE

We reported case series of deep neck abscesses comorbid with kidney failure undergoing therapies with various outcomes. Informed consents had been obtained from patients to presents medical record based-data in this report.

Case 1

A female patients aged 35 years presented with chief complaint of swollen neck accompanied by fever and breathless while lying down since 2 days before admission. Physical and medical examinations found bilateral submandibular abscess accompanied with bilateral parapharyngeal and retropharyngeal abscesses. Radiographic imaging of neck soft tissue shows radiopaque and radiolucent of minimaly multiple air at right colli until right supraclavicle suggesting a right colli abscess (Picture 1). Radiographic imaging shows bronchopneumonia dan cardiomegaly (Picture 2). Laboratory tests show kidney failure (ureum 281.4 mg/dL, and creatinine 10.12 mg/dL), controlled hypertension (averaged blood pressure 120/80 mmHg), leucocytosis (51000 cells/mm³), and hypocalcemia (4.37 mg/dL).

Early management involves rehydration of cristalloid fluid and calcium gluconate in dextrose 5% to manage hypocalcemia followed by hemodialysis. Results show that ureum and creatinine decrease to 153.9 mg/dL and 5.09 mg/dL respectively.

Subsequently, patients underwent incision and drainage of abscess under general anesthesia. A day after surgery, patient experienced fatigue, short of breath, and supraventricular, intercostal and subcostal retraction,

In intensive care unit, patients was put on a ventilator, and antibiotics of meropenem and levofloxacin were administered. A blood culture test was performed and patients was planned for urgent hemodialysis (ureum and creatinine level escalated to 300.4 mg/dL and 7.9 mg/dL respectively). However, patient experienced decreased consiousness level and was finally died.

Case 2

A male patients aged 52 years presented with chief complaint of pain, swollen neck and painful swallowing. Patient had history of toothache 6 days before admission, fever and pus came out from the mouth.

Physical examination and imaging test show submental abscess along with right submandibular



Picture 1. Radiographic imaging of neck soft tissue (Case 1)



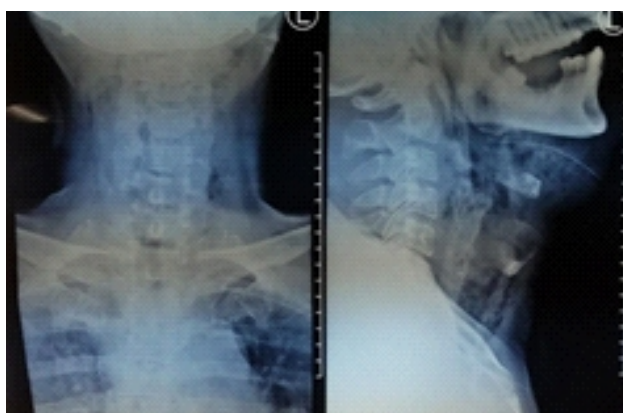
Picture 2. Thoracix X-ray (Case 1)



Picture 3. Next soft tissue X-ray (Case 2)



Picture 4. Chest X-ray (Case 2)



Picture 5. Neck soft tissue X-ray (Case 3)

abscess, parapharyngeal abscess, and retropharyngeal abscess. Neck soft tissue X-ray shows soft tissue mass and subcutaneous emphysema in submandibular and bilateral colli area caused by colli abscess (Picture 3).

Patient suffered from uncontrolled hypertension stage 2 (blood pressure 170/90 mmHg) and kidney failure (ureum 180.7 mg/dL and creatinine 1.87 mg/dL), suspected diabetes mellitus (random blood glucose 135 mg/dL), and airway obstruction grade 2.

Patient underwent tracheostomy under local anaesthesia followed by incision and drainage under general anaesthesia.

After surgery, patient was administered crystalloid fluids for rehydration therapy to manage kidney failure, and antibiotics (ceftriaxon and metronidazole), paracetamol and amlodipine oral to manage hypertension.

Patient experienced decreased consciousness level and transferred to ICU. Therapies involving switching antibiotic (meropenem), analgesics (morphine, paracetamol, and midazolam), omeprazole, tranexamic acid, vitamin K, nebulizer, N-Acetylcistein, and vasodilator (vascon) were administered to manage hypotension.

Patient's condition worsened on the fifth day in ICU and he was administered therapies involving switching antibiotic (levofloxacin), dobutamine and norepinephrine to manage hypotension. Patient was planned for hemodialysis. However, his condition continuously got worse and he went into cardiac arrest so cardiopulmonary resuscitation (CPR) was performed until patient was died.

Case 3

A male patient aged 50 years presented with left submandibular abscess and submental abscess spreading to left buccal, and suspected ruptured retropharyngeal abscess (Picture 5). Patients was referred from Department of Oral Sugery of Hasan Sadikin Hospital and had undergone incision and drainage of abscess.

Laboratory test shows kidney failure (ureum 243 mg/dL and creatinine 3,05 mg/dL). Subsequent management involves rehydration with cristalloid fluid, antibiotics (ceftriaxone and metronidazole), and analgesic (paracetamol) and tracheostomy to prevent aspiration.

Series laboratory test of serum creatinine was performed. On the fifth day of treatment, serum creatinine

declined significantly to normal and pus production is considerably decreased. Patient was discharged on the sixth day of treatment.

RESEARCH QUESTION

What is the proper management of patients with neck abscess comorbid with kidney failure?

METHODS

Literature search was conducted in Pubmed, Clinical Key, and Google Scholar using search terms of “deep neck abscess”, “renal failure” and “therapy”, synonyms and related terms (Diagram 1). Subsequently, a critical appraisal (Table 1) was conducted. Checklist used for critical appraisal were retrieved from www.joannabriggs.com.

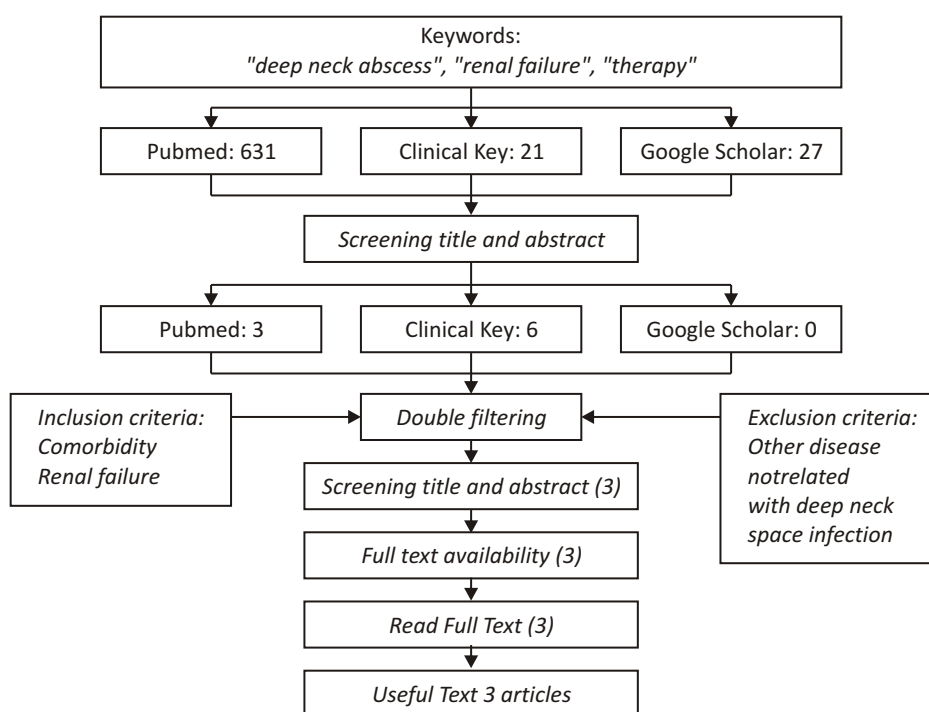


Diagram 1. Search flow chart

TABLE 1
Critical appraisal of three articles using the checklist

Checklist	Kurniawan et al. ¹⁶	Novaldi et al. ⁵	Chang et al. ²
Patient's demographic characteristic is clearly described	-	-	+
Patient's history is clearly described and presented as timeline	+	+	-
Current clinical condition of patient is clearly described	+	+	-
Diagnostic tests or assessment methods and the results are clearly described	+	+	-
Interventions and treatment procedures are clearly described	+	+	+
Post-intervention clinical condition is clearly described	+	+	+
Adverse or unanticipated events are identified and described	-	-	+
The case report provide takeaway lessons	+	+	+
Level of Evidence*	5	5	5

Note: (+) yes, (-) no, (u) unclear ; *Level of Evidence retrieved from Centre of Evidence Based Medicine, University of Oxford

RESULTS

Novialdi *et al.*⁵ reported a case of submandibular abscess comorbid with uremia (ureum 101 mg/dL and creatinine 1,3 mg/dL) and old myocardial infarction among male patient aged 88 years.

Patient was administered antibiotics (ceftriaxone and metronidazole), anti inflammatory drug (dexamethasone) and underwent incision and drainage procedures under local anesthesia.

Kidney failure was managed with rehydration but conditions did not improve and got worse until patient was died.

Kurniawan *et al.*⁶ reported upper airway obstruction caused by retropharyngeal abscess and sepsis induced by acute kidney failure in female patients aged 48 years.

Patient was hospitalised and administed cristalloid fluid rehydration, antibiotics (ceftriaxone and metronidazole), analgesic (ketorolac) and underwent incision and drainage of abscess. On the fifth day of treatment, patients was discharged.

The current management of kidney failure is based on KDIGO guidelines year 2012 involving fluid rescucitation, early antimicrobial therapy and infection control, vasopressor and inotropic agent to maintain tissue perfusion, and hemodialysis. As diagnostic markers and successfull therapy, series of laboratory tests of serum creatinine and urine output monitoring are performed.⁷

DISCUSSION

Deep neck abscess comorbids with kidney failure is still common. A study by Chang *et al.*² in Taiwan reported 280 of 127.283 kidney failure patients experience deep neck abscess (0.1%).

Early management involves rehydration therapy of cristalloid fluid, antibiotic, surgery and hemodialysis (the first and second cases). This is in line with KDIGO kidney failure management guidelines year 2012 involving fluid rescucitation, early antimicrobial therapy and infection control, vasopressor and inotropic agents, and hemodialysis.⁷

Fluid therapy is an important key to optimize hemodynamic of more severe kidney failure.⁷

Proper antimicrobial therapy along with infection control related to risk of worsened kidney failure and possibility of kidney recovery within 24 hours should be considered. Recommended antimicrobial therapy for kidney failure includes amikacin, meropenem, vancomycin, gentamicin, ciprofloxacin, cefepime, and clindamycin. The chosen antibiotics for the above three cases are ceftriaxone and metronidazole as empirical antibiotics for early management before the result of blood culture test are released and meropenem for

patients with hemodialysis.⁷

In the first dan second cases, pasien were administered vasodilators to maintain adequate organ perfusion but unfortunately it is also influenced by many factors such as hypertension and suspected diabetes mellitus in the first and second cases. It is corroborated by a study by Chang *et al.*² explaining that deep neck abscess is influenced by comorbidities such as diabetes mellitus, hypertension, coronary heart failure, cerebrovascular insufficiency, and chronic obstructive pulmonary disease (COPD). The so many comorbidities influence the successful management of deep neck abscess.

In the first case, patient had bad prognosis. According to KDIGO criteria, patients is categorized in the grade 3 which may result in death.⁷

The KDIGO guidelines year 2012 recommends diagnosing and monitoring of the successful management of kidney failure based on serum creatinine and urine output monitoring. In the third case, patients was only monitored for its serum creatinine (and ureum), but urine output is not as a reference value for kidney failure management.⁷

In conclusion, kidney management is the first priority for deep neck abscess comorbids with kidney failure followed by management of deep neck abscess in hope that morbidity and mortality is avoided.

CONFLICT OF INTEREST

No conflict of interest during this study.

REFERENCES

1. Lee. K. J. Essential Otolaryngology Head and Neck Surgery Ed 11. New York: Mc Graw Hill Medical. 2016. P.585–602
2. Chang GH, Tsai MS, Liu CY, *et al.* End-stage renal disease: a risk factor of deep neck infection a nationwide follow-up study in Taiwan. BMC Infect Dis 2017;17, 424.
3. Imanto M., Evaluasi penatalaksanaan abses leher dalam di Departemen THT-KL RS Hasan Sadikin Bandung Periode Januari 2012–Desember 2012 [Evaluation of deep neck abscess in Department of ENT, Hasan Sadikin Bandung Hospital, period of January 2012 December 2012]. Juke Unila. 2015. 5(9). p33–37
4. Vaziri ND, Pahl MV, Crum A, Norris K. Effect of uremia on structure and function of immune system. J Ren Nutr. 2012 Jan;22(1): 149–56. doi: 10.1053/j.jrn.2011.10.020. PMID: 22200433;PMCID:PMC3246616.
5. Novaldi, Asyari A. Penatalaksanaan abses submandibula dengan penyulit uremia dan infark miokardium lama [Management of submadibular abscess comorbid with uremia and old myocardial infarction]. Jurnal kesehatan andalas. 2018.p1–7
6. Kurniawan I, Nurwiadh A, Lukman K. Sepsis - induced acute kidney injury in oral and maxillofacial infection with upper airway obstruction due to retropharyngeal abscess – a case report. Journal of Dento-maxillofacial science. 2016. 1(3). p.201-5
7. Moore P, Hsu R, Liu K. Management of acute kidney injury: core curriculum 2018. AJKD 2018;72(1):136–4.