INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

ORAL IMPLICATIONS OF CHRONIC KINDEY DISEASE: A CASE SERIES

Case Series

Minahil Abbas[1], Zulkaif Younas[2], Farwa Shabir Bhatti[3], Malika Attiq[2], Surat Babar[4], Asma Shakoor[5], Hira Butt[6]*
[1]General Dental Practitioner/Qc Assistant, Quality Control Department, Ensmile, Lahore, Pakistan.
[2]Final Year BDS Student, College of Dentistry, Sharif Medical and Dental College, Lahore, Pakistan.
[3]General Dental Practitioner, Tasleem Dental Clinic, Gujranwala, Pakistan.
[4]House Officer, Bakhtawar Ameen Dental College, Multan, Pakistan.
[5]Associate Professor/HOD, Community& Preventive Dentistry Department, Institute of Dentistry, CMH-Lahore. Medical College, National University of Medical Sciences (NUMS), Pakistan.
[6]General Dental Practitioner, Lahore, Pakistan.
Corresponding Author: Hira Butt, General Dental Practitioner, Lahore, Pakistan. hira.ah.butt@gmail.com
Acknowledgement: The authors sincerely thank all patients for their participation and cooperation in this case series.

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: Chronic Kidney Disease (CKD) is a progressive systemic disorder characterized by a gradual loss of kidney function over time. This decline often results in various complications, including significant oral health issues. These oral manifestations may arise directly from systemic effects of CKD or indirectly due to medications used for its treatment. Common oral complications include candidiasis, de-papillated tongue, and acute necrotizing ulcerative gingivitis (ANUG), each posing distinct diagnostic and management challenges.

Objective: To present and analyze three clinical cases of oral manifestations in patients with different stages of CKD, highlighting the importance of a multidisciplinary approach to oral care in these individuals.

Methods: This case series evaluated three patients diagnosed with CKD who presented with distinct oral health issues. Comprehensive oral examinations were conducted using the Community Periodontal Index for Treatment Needs (CPITN) and the Decayed, Missing, and Filled Teeth (DMFT) index. Clinical findings were confirmed with histopathological evaluations when necessary. Each case was managed using condition-specific treatments, including topical and systemic antifungals, oral hygiene therapy, and supportive care such as hydration and nutritional counseling.

Results:

- **Case 1:** A 35-year-old male with end-stage renal disease (serum creatinine: 10 mg/dL) undergoing dialysis presented with candidiasis. Treatment resulted in complete resolution within two weeks.
- **Case 2:** A 50-year-old female with stage 3 CKD (serum creatinine: 2 mg/dL) presented with a de-papillated tongue. Oral hygiene improvement and nutritional support addressed the issue effectively.
- **Case 3:** A 24-year-old female with end-stage renal disease (serum creatinine: 6 mg/dL) developed ANUG. A combination of scaling, root planing, debridement, and antibiotic therapy successfully managed the condition.

Conclusion: CKD patients are susceptible to various oral complications due to systemic immunosuppression and treatment-related side effects. Timely dental evaluation and management are essential to prevent oral health deterioration in these individuals. A multidisciplinary approach, involving both nephrologists and dental professionals, is vital for improving overall patient outcomes.

Keywords: Acute Necrotizing Ulcerative Gingivitis, Candidiasis, Chronic Kidney Disease, Dialysis, Immunosuppression, Oral Manifestations, Tongue Diseases

INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

INTRODUCTION

Chronic Kidney Disease (CKD) is a progressive decline in kidney function over months or years, which often leads to complications like hypertension, anemia, bone disease, and cardiovascular issues(1). Chronic kidney disease has been shown to have oral implications. One study evaluating oral issues due to this systemic illness reported patients to have candidiasis, gingival inflammation(2). Patients with a chronic systemic complication have a suppressed immune response(3). This can lead to the development of superimposed opportunistic infections(4). Candidiasis is one such infection that has high prevalence in medically compromised individuals(5).

Bald or de-papillated tongue is a common finding in patients with CKD due to nutritional deficiencies that leads to a low B12levels in the body which results in bald tongue(6). The tongue has small bumps called papillae, which contain taste buds and contribute to the tongue's texture(7). When these papillae become flattened or atrophied, it leads to a smooth or glossy appearance of the tongue, known as de-papillation or atrophic glossitis(8). This condition can result from various factors, including nutritional deficiencies, certain medications, or underlying health conditions, including CKD(9).

Acute Necrotizing Ulcerative Gingivitis (ANUG), also known as trench mouth, is a severe form of periodontal disease characterized by the rapid onset of painful, necrotic lesions in the gingival tissues, often associated with foul odor, bleeding, and ulceration(10). ANUG has been reported to appear in Chronic kidney disease patients very rarely(11). It is caused by an imbalance in the oral microbiome, often due to factors such as stress, smoking, poor oral hygiene, immunosuppression, or malnutrition(12). The co-occurrence of ANUG in a patient with CKD presents unique clinical challenges due to the interplay between the immune system dysfunction in CKD and the susceptibility to infections like ANUG(11).

CASE 1: CANDIDIASIS IN PATIENT WITH END STAGE RENAL DISEASE

A 35-year-old male patient presented to the clinic with a complaint of burning sensation in the tongue. Medical history revealed that the patient was suffered from end stage renal disease in the past and had a serum creatinine levels of 10mg/dl. This patient was undergoing dialysis since 7 years and was taking Loprin as a blood thinner before finally undergoing a renal transplant. The patient reported using an immunosuppressant. Intra-oral examination by means of Community periodontal index for treatment needs (CPITN) and DMFT (Decayed, missing, filled teeth) index. CPTIN revealed that he had calculus deposition. DMFT revealed that he had decayed and missing teeth but no filled teeth. Intro-oral examination revealed a white coated tongue along with fissures. Clinical and histopathological evaluation revealed it to be Candidiasis. The intra-oral picture of the tongue is shown in figure 1. The patient was provided with treatment using topical and systemic anti-fungals. Supportive care in the form of increase fluid intake and instructions for good oral hygience maintainence were given. The patient reported after 2 weeks with complete resolution of the problem.

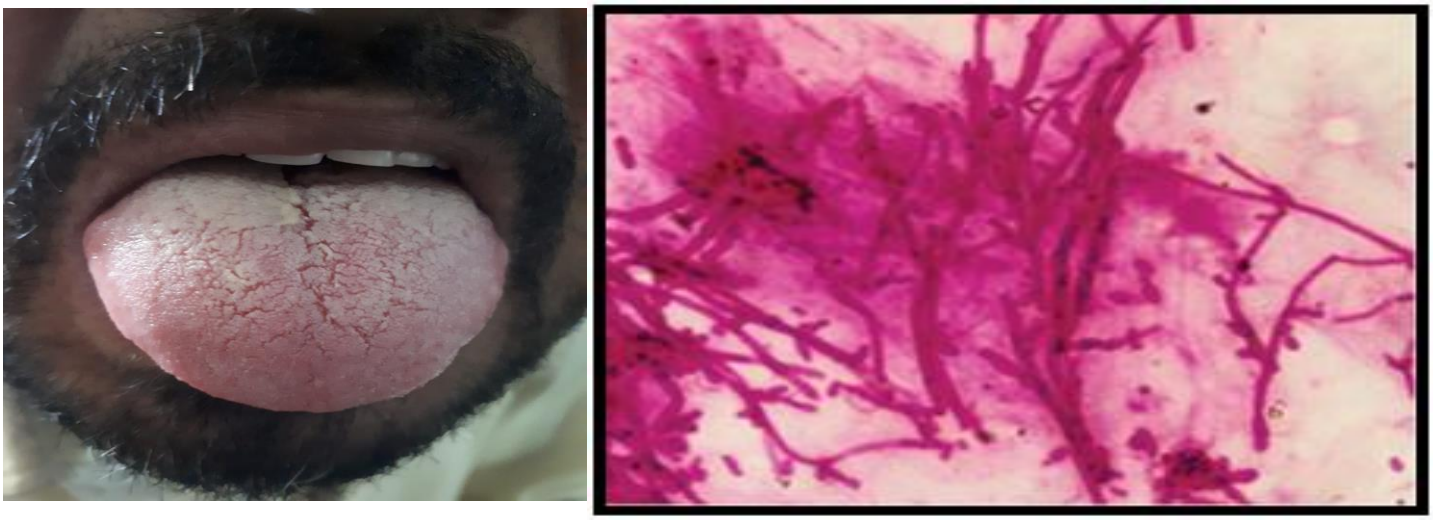

Figure 1: Oral Candidiasis in end stage renal disease patient clinical picture and histopathology

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

CASE 2: DE-PAPILLATED TONGUE IN PATIENT WITH STAGE 3 CHRONIC KIDENY DISEASE

A 50-year-old female presented to the clinic with red and inflamed tongue. Medical history revealed her to be a patient of stage 3 chronic kidney disease. Her serum creatinine level was 2mg/dl. She reported that she had never undergone dialysis or renal transplant. Medical history further revealed that she did not use any blood thinners and immunosuppressant. Periodontal health evaluation with CPITN revealed she had bleeding gums. Her DMFT score was also high and decayed and missed teeth were seen on intra-oral examination. After clinical examination she was diagnosed with de-papillated tongue. The tongue appeared to be very glossy, red and inflamed as shown in figure 2.

Figure 2: de-papillated tongue in patient with stage 3 chronic kidney disease

CASE 3: ACUTE NECROTIZING ULCERATIVE GINGIVITIS

A 24-Year-old female presented to the clinic with a complaint of metallic taste of mouth. Medical history revealed her to be a patient of end stage renal disease. Her serum creatinine levels were 6mg/dl. The patient had been undergoing dialysis since 2 months and was taking Loprin as a blood thinning agent. Her intra-oral examination revealed desquamated epithelium and greyish slimy film covering the alveolar bone. The alveolar bone was partially denuded at some points as shown in figure 3. A diagnosis of Acute necrotizing ulcerative gingivitis was made. The patient was treated using a a combination of oral hygiene and antibiotic therapy. Scaling, root planning and debridement was done after locally anesthetizing the patient.

Figure 3: ANUG in patient with end stage renal disease

DISCUSSION

In patients with chronic kidney disease candidiasis has been reported to have a high prevalence. A case has been reported previously where a 58-year-old male who was a patient of chronic kidney disease presented to the clinic with a soreness in the mouth and dysphagia. Intro-oral examination revealed him to have white coated tongue and patches. An oral swab was sent for evaluation to the lab and a diagnosis of candidiasis was made(13). This case is similar to our case of oral candidiasis of a 35 year of male suffering from end stage renal disease who presented to the clinic with burning mouth.

A link between de-papillated tongue and chronic kidney disease has been reported previously(14). Bald tongue can be a result of toxicity due to elevated uric acid levels in these patients(14). As the urea and waste products fail to the body the appearance of the tongue may become dry, swollen and bald(15). This change in tongue appearance can also be due to deficiencies of B12 and Iron that are common due to the systemic illness(16). Dehydration in CKD patients can also lead to such an appearance due Xerostomia(17). These could be the contributing factors for the development of bald tongue in our patient who was 50-year-old female suffering from stage 3 CKD who presented to the clinic with de-papillated tongue.

Literature reports that a 58-year-old male who was a stage 3 CKD patient reported to the clinic with a poor oral hygiene and inability to maintain oral health due to exhaustion form his chronic illness(11). Intra-oral examination revealed him to have characteristic symptoms of ANUG which included ulcers, bad breath and pseudomembranous film across his gingiva(11). This case is similar to our case of a 24-Year-old female who was suffering from end stage renal disease and had ANUG. The development of ANUG in CKD patients can be attributed to immunosuppression(11). Due to which the body of these patients is more prone to the development of opportunistic infections(18). A common systemic implication of CKD is Xerostomia(19). Xerostomia can lead to reduction in salivary flow which promotes bacterial growth(20). Certain medications given to CKD patients can lead to gingival overgrowth and other oral issues(20).

CONCLUSION

Chronic kidney disease has a number of oral implications. It is extremely essential that patients with such a chronic systemic illness are dealt with multidisciplinary approach. It is essential to have dentists on board to provide effective and timely oral care to such patients to avoid oral implications which are a result of these systemic complications.

AUTHOR CONTRIBUTIONS

Author	**Contribution**
Minahil Abbas	Literature review & Manuscript write-up
Zulkaif Younas	Manuscript write-up
Farwa Shabir Bhatti	Literature review & Manuscript write-up
Malika Attiq	Literature review
Surat Babar	Literature review and manuscript write-up
Asma Shakoor	Literature review
Hira Butt*	Data Collection, concept and design, Manuscript write-up, critical revision, Supervision and final Approval

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

REFERENCES

1. Kalantar-Zadeh K, Jafar TH, Nitsch D, Neuen BL, Perkovic VJTl. Chronic kidney disease. 2021;398(10302):786-802.

2. Kesmez Ö, Frøjk MJ, Eidemak I, Jensen SB, Kragelund CJA. Oral symptoms and pathologies in Danish patients with chronic kidney disease-a pilot study. 2020;128(5):401-5.

3. Wang Y, Zhou Y, Huang C, Wang Y, Lou L, Zhao L, et al. Development of a prediction model for in-hospital mortality in immunocompromised chronic kidney diseases patients with severe infection. 2025;26(1):1-10.

4. Kumar V, Jha V. Infectious Complications and Vaccination in Chronic Kidney Disease. Management of Chronic Kidney Disease: A Clinician's Guide: Springer; 2023. p. 285-98.

5. Mahdi SS, Muhsen TA, editors. THE ROLE OF FUNGAL INFECTIONS IN THE PATHOGENESIS OF DIALYSIS-DEPENDENT AND NON-DIALYSIS-DEPENDENT PATIENTS WITH KIDNEY DISEASE. Obstetrics and Gynaecology Forum; 2024.

6. McNeish JE, McNeish LW. Oral Manifestations of Systemic Disease. Dental Science for the Medical Professional: An Evidence-Based Approach: Springer; 2023. p. 309-20.

7. Mangold AR, Torgerson RR, Rogers III RSJCiD. Diseases of the tongue. 2016;34(4):458-69.

8. Nsir S, Bouslama G, Ghanmi F, Boukhris H, Oualha L, Youssef SBJDR. The tongue: a bridge between physiology and disorder. 2025.

9. Guinn AC, Rouleau TS, Brennan MTJTJotADA. Burning tongue and lips. 2010;141(5):541-5.

10. Stevens Jr AW, Cogen RB, Cohen-Cole S, Freeman AJJoCP. Demographic and clinical data associated with acute necrotizing ulcerative gingivitis in a dental school population* (ANUG-demographic and clinical data). 1984;11(8):487-93.

11. DE MELO KFF, Dourado M, Cabral D, Andrade LJKIR. Corrigendum to "WCN24-1675 ACUTE NECROTIZING ULCERATIVE GENGIVITIS IN KIDNEY TRANSPLANTATION: A CASE REPORT"[Kidney International Reports Volume 9, Issue 4, Supplement, April 2024, Page S473]. 2024;9(6):1937-8.

12. Einsfeld V, Silva MCP, Gonçalves KW-D, Da Silva WPP, Albonei M, Sassi LM, et al. ACUTE NECROTIZING ULCERATIVE GINGIVITIS IN ONCOPEDIATRIC PATIENTS: CHALLENGES IN TREATMENT. 2022;134(3):e147.

13. Gomes OV, de Oliveira Campos MR, Silva GEBJK. White Plaques on the Tongue of a Patient with Advanced CKD. 2022;3(9):1652-3.

14. Malik M, Maqbool M, Nisar T, Akhter T, Ujan JA, Algarni AS, Al Joufi FA, Alanazi SS, Almotared MH, Bekhit MM, Jamil M. Deciphering key genes involved in cisplatin resistance in kidney renal clear cell carcinoma through a combined in silico and in vitro approach. Oncology Research. 2023 Sep 15;31(6):899–916. doi: 10.32604/or.2023.030760

15. Costacurta M, Basilicata M, Marrone G, Di Lauro M, Campolattano V, Bollero P, et al. The impact of chronic kidney disease on nutritional status and its possible relation with oral diseases. 2022;14(10):2002.

16. Patil RG, Bhosle DG, Malik RJIJDMS. Vitamin B12 deficiency in chronic kidney disease. 2016;15(9):22-5.

17. Belazelkovska A, Popovska M, Spasovski G, Masin-Spasovska J, Cekovska S, Atanasovska-Stojanovska A, et al. Oral and salivary changes in patients with chronic kidney disease. 2014;12(2):97-102.

18. Kaul A, Chauhan TSJIJoT. Opportunistic infection in renal transplant recipients. 2014;8(Suppl 1):S57-S64.

19. Bossola M, Tazza LJNRN. Xerostomia in patients on chronic hemodialysis. 2012;8(3):176-82.

20. Rambabova EJK-IJ. COMPARATIVE ANALYSIS OF THE REPRESENTATION OF XEROSTOMIA AND UREMIC FETOR IN PATIENTS WITH CHRONIC KIDNEY DISEASE AND DIABETES MELLITUS AND BETOR PATIENTS WITH CHRONIC MELLITUS. 2024;64(4):405-8.