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CASE REPORT

Oral Findings of *Candida albicans* and *Cryptococcus laurentii* in Elderly with Intracerebral Hemorrhagic Stroke in Intensive Care Unit: A Case Report

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ABSTRACT

Introduction: Intracerebral haemorrhage patients are susceptible to developing an oral infection due to hospitalised intervention. The systemic disease and degree of consciousness also supported the development of oral infection, especially fungal. **Case:** This case presented an elderly female with an intracerebral haemorrhage stroke. The oral lesion was developed as a pseudo membrane during the five days of endotracheal tube intubation. The direct examination showed the presence of Candida colonies and *Cryptococcus laurentii*. **Conclusion**: Oral hygiene maintenance, including topical antiseptic and anti-fungal, can improve oral health and prevent Candidemia and other fungal sepsis.

Keywords: oral health care; fungal infection, elderly, sepsis

INTRODUCTION

Stroke is a neurological disorder caused by obstructing blood flow to the brain, leading to bleeding or blockage of blood vessels. The signs and symptoms vary based on the location of the affected brain and can result in complete or partial recovery with a disability or even death. Hemorrhagic and non-hemorrhagic strokes are the primary classification of stroke based on pathology and clinical symptoms. [1]

Intracerebral haemorrhage is a type of hemorrhagic stroke commonly observed in the 40-70-year-old age group, with several identified risk factors, including hypertension, advanced ages, anticoagulant use, hematologic abnormalities, and another chronic disease.[1]

Stroke is the leading cause of disability, and patients are susceptible to oral health problems such as decreased salivary flow rate and the growth of microorganisms in the oral cavity.[2,3] These conditions increase the risk of secondary infections, including fungal infections, the incidence of oral ulcers due to device pressure and seizure, periodontitis, and bleeding.[3] In this case report, we discuss oral health management in elderly patients admitted to the intensive care unit diagnosed with intracerebral hemorrhagic stroke to reduce the risk of secondary infection, including candidemia.

CASE REPORT

A 70-year-old female patient with a primary diagnosis of intracerebral haemorrhagic in the cortical hemisphere was referred to the oral medicine clinic by a neurologist to examine the oral cavity condition. The patient has been hospitalized for 47 days with complaints of decreased

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consciousness for five days, preceded by vomiting. During that time, the patient's Glasgow Coma Scale score was 11 (somnolence), and they presented with a nasal cannula. The patient had hypertension, diabetes mellitus and hypercholesterolemia.

Intra-oral examination showed that the oral mucosa was dry, and saliva crusting on the tongue, buccal mucosa, hard palate and desquamation of the lips were found **(Figure 1A-B**). The objective examination of dry mouth was carried out using the Challacombe Scale, and the severity of dry mouth was measured with a nine-point score **(Table 1).**

Table 1. Challacombe Scale of Clinical Oral Dryness of the Patient.

Item	Score
Mirror sticks to buccal mucosa	1
Mirror sticks to the tongue	1
Saliva Frothy	0
No saliva pooling in floor of the mouth	1
Tongue shows generalized shortened papillae (mild depapillation)	1
Altered gingival architecture (ie. smooth)	1
Glassy appearance of oral mucosa (esp. palate)	1
Tongue lobulated or fissured	1
Cervical caries (more than two teeth)	1
Debris on palate or sticking to teeth	1
Total	**9 -(severe dryness)**

Debridement was performed using normal saline to remove saliva crusting and followed by 0.2 % chlorhexidine digluconate to asepsis and the lips was moistened with borax glycerin.

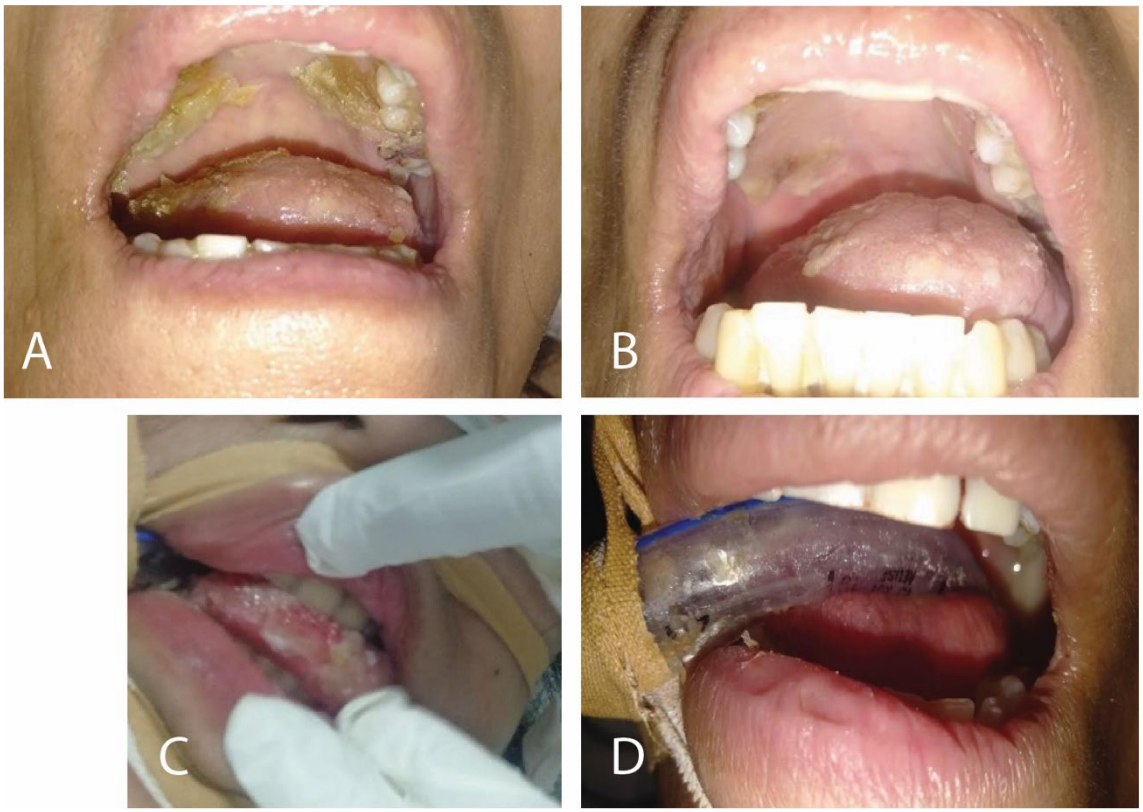

Figure 1. The oral mucosa in the patient with pseudomembrane of palatum and dorsum of the tongue before endotracheal intubation (A-B). The intraoral development after endotracheal intubation (C) and the intraoral after debridement, asepsis, and nystatin application (D).

In the next five days, the patient's consciousness decreased, with 6 of GCS (stupor) and endotracheal intubation connected to a ventilator was installed. Intra-oral examination showed a white-yellowish pseudomembrane on the dorsum of the tongue **(Figure 1C).** The pseudomembrane was scrapped and subjected to microbial examination. The debridement of the pseudomembrane was done using normal saline, followed by 0.2% chlorhexidine, and the lip lesion was applied with borax glycerine.

The haematology studies showed decreased haemoglobin, hematocrit, lymphocytes, and platelets, while leukocytes and neutrophils were increased. The microbial examination of the tongue swab specimen using Vitex® 2 Compact showed Candida albicans and Cryptococcus laurentii. Nystatin 100.000 IU/ml was topically applied to the tongue's surface at 1 ml four times daily for five days. The final condition, the intra-oral, improved, and the pseudomembrane disappeared (**Figure 1D)**.

DISCUSSION

This patient had a stroke with intracerebral hemorrhagic type, resulting in total paralysis and a decrease in consciousness. Consequently, the patient also lost the ability to swallow and close the mouth, which causes xerostomia and the development of saliva crusting. This patient had been hospitalized for 47 days with a decreased general condition. Her immunodeficiency had also trigger susceptibility to secondary infection, with the growth of microorganisms in the oral cavity.[4]

This intraoral problem became worse when the patient was admitted to the ICU. Patients with low consciousness and limitation of movement, especially intraoral, reduce saliva secretion and cause dryness in the mouth. Subsequently, crusts on the oral mucosal surface develop to harbour microbial colonization.[5] As such, hospitalised patient, especially in the ICU, would easily develop fungal infections due to their disability, hospitalised procedures, and unstable vital and medical signs that create retention to fungal growth. [3,4]

Oral candidiasis is a fungal infection that occurs in the oral cavity. The oral cavity is suitable for yeast colonisation because of the moist environment and nutrient availability. *Candida albicans*, the most dominant yeast in the oral cavity and most pathogenic Candida spp are pleomorphic microorganisms with different growth forms: rod-shaped, yeast (blastopore), hyphae or pseudohyphae and chlamydospores. Candida is a commensal oral flora. However, various factors, such as immune system disorders, antibiotics, and corticosteroids, would change the oral microorganism balances and turn the normal flora into pathogenic.[7]

Cryptococcus infection can be found in hospitalized and immunocompromised patients. The immunocompromised and diabetic,[16] chronic lymphocytic leukaemia,[11] HIV,[12]as well as non-HIV are also prone to this infection.[6] In elderly patients with corticosteroid-inhaled, there is a higher incidence of *cryptococcus.*[15] *Cryptococcus Laurentii* is a very rare human pathogen. Initially, this fungus was considered saprophytic and non-pathogenic to humans. However, *Cryptococcus Laurentii* in skin infections have been reported.[7] In this case, *Cryptococcus laurentii* did not manifest clinically and was identified during the culture examination.

One of the antifungal agents used during oral debridement was Chlorhexidine digluconate. It is a broad-spectrum antimicrobial belonging to the bisbiguanide family and is commonly used in its gluconate form. Chlorhexidine attacks gram-positive and negative bacteria, yeast bacteria, and fungi. Antifungals work by damaging the permeability of cell wall membranes and extracellular proteins of fungi, such as *Candida albicans*, protozoa, algae, and viruses.[9,10]

The chlorhexidine formula is considered the gold standard, composed of N1 and N5, a biguanide substitution bonded to hexamethylene and two chlorophenol rings at both ends. Chlorhexidine at low doses will interfere with cellular transport so that the formation of pores in the cellular membrane damages fungal cells. Chlorhexidine digluconate 0.2% is an antiseptic active against bacteria and fungi. Chlorhexidine digluconate 0.2% has been shown to reduce the growth of microorganisms significantly and has a very strong inhibition zone against several fungal species, especially Candida albicans.[9,10]

CONCLUSION

Appropriate oral lesion management is needed to prevent the increased risk of candidemia as a secondary infection, especially in hospitalised patients and the elderly. Oral hygiene procedures are also important to prevent the spread of Candida and Cryptococcus. Antiseptics like 0.2% chlorhexidine digluconate can be used to debride the oral lesion, and topical Nystatin can control the colonisation of *Candida albicans* and Cryptococcus.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

INFORMED CONSENT

Informed consent was obtained before the preparation of the case report, and the authors endeavoured all efforts to ensure anonymity.

ETHICAL STATEMENT

The ethical approval exemption was obtained from the Ethics Committee of The Hospital.

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