

# EFFECT OF WEARING COMPLETE DENTURES ON THE CANDIDAL COUNT IN THE ORAL CAVITY

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## ABSTRACT

**Background:** After the loss of natural teeth, dental prosthesis is of vital importance for the functional and esthetic restoration. Denture wearing is accepted as a pre disposing factor for oral candidiasis. **Objective:** To compare the candidal growth before and after the insertion of complete dentures. **Materials and Methods:** A total of forty patients wearing complete denture were included in this cross-sectional study. This study was conducted from 15<sup>th</sup> January, 2009 to 15<sup>th</sup> January, 2010 at department of Prosthodontics Lahore Medical & Dental College, Lahore. They were asked to rinse their mouth with 10ml of saline in fasting condition. The rinse was centrifuged and the deposit was sent to the Microbiology Laboratory for evaluation. The data was entered and analyzed in SPSS version 13. **Results:** At the time of insertion the candidal count zero in all patients and after one month of wearing denture 35% of the patients showed oral candidal growth. (P= 0.000). **Conclusion:** The results of present study revealed that there is a significant quantitative increase in on the candidal count after complete denture wearing.

**Key words:** Dentures, Candida, Oral Cavity

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## INTRODUCTION

Dental prosthesis is indispensable for the functional and esthetic rehabilitation after the loss of natural teeth. Need for dentures are expected to rise to 37.2 million in adults by 2020.<sup>1</sup> Denture related stomatitis affecting the palatal mucosa is quite common. Plaque is defined as a dense microbial layer on teeth, with their metabolites. Denture prosthesis has the same microbial combination as that of dental plaque present on natural teeth except for an increase in number of candida species.<sup>2</sup>

*Candida albicans* is a diploid fungus with dimorphic morphology. It is a human commensal inhabiting the oral cavity, gastrointestinal tract, female genital tract and skin. *Candida albicans* is the most frequent fungal opportunistic pathogen in humans.<sup>3,4</sup>

Dentures can give rise to oral candidiasis like oral thrush or stomatitis. They can also cause caries. Microorganisms present in the dental plaque serve as a reservoir for disseminated infection.<sup>5,6</sup> *Candida* species can also cause gastrointestinal pleuro-pulmonary infections.<sup>7</sup> Denture stomatitis is pathological reaction of denture bearing mucosa as a result of either trauma to it or wearing an ill-fitting denture. If candida is found in this lesion it is known as candida associated denture stomatitis'

pathological lesion. Denture wearing is accepted as a pre disposing factor for oral candidiasis. The surface irregularities and roughness of the denture enhance the microorganism to stay-on denture even after cleaning and so continuous reinfection of the palate occurs.<sup>8,9</sup> Failure to maintain satisfactory prosthesis hygiene is related with a high level of oral candidal colonization.<sup>10</sup> An important factor is the high candidal counts in oral cavity after complete denture provision which may lead to candida induced denture stomatitis. The objective of present study was to compare the candidal growth before and after the insertion of complete denture.

## MATERIAL AND METHODS

In this cross-sectional study, forty edentulous patients who full filled the inclusion criteria were provided with complete denture. This study was conducted from 15<sup>th</sup> January, 2009 to 15<sup>th</sup> January, 2010 at department of Prosthodontics Lahore Medical & Dental College, Lahore. **Inclusion criteria:** First time denture wearers between 50-65 years of age. **Exclusion criteria:** Patients with history of treatment with chemotherapy or radio therapy in the head and neck region. In addition, patients having history of use of broad spectrum antibiotics or steroids in the past six months, smokers and diabetics were also excluded. **Data collection procedure:** Patients were selected by purposive non-probability sampling technique. Oral rinse technique was used to take samples. A volume of 10 ml of sterile saline in sterile container was provided to the patients. The patients were sampled between 9-10 am in fasting condition of two hours. The patients were advised to rinse their mouth for 60 seconds. Later

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oral rinse was centrifuged at 1700g for 10 minutes. The supernatant was discarded and 1 ml of saline was added to the deposit. Laboratory procedure included direct microscopy, centrifugation, and the specimens were cultured on Sabouraud's media. The growth was identified and the colonies were counted. Later Gram's staining and microscopy were also done. *Candida albicans* was further confirmed by germ-tube test. After instructions on how to clean their denture, patient was recalled after one month and same sampling procedure repeated. **Data analysis procedure:** Data was entered in SPSS version 13 for analysis. Non parametric sign test was applied to compare candidal out come at the time of insertion and after one month of wearing complete dentures. The p-value = 0.05 was considered as significant.

## RESULTS

A total of 40 edentulous patients who were provided with first time complete dentures were included in this study. Most (60%) of the patients were between 50-65 years of age. Average age was  $58.90 \pm 4.37$  years.

Out of 40 patients 20 (50%) were male and 20 (50%) were females with 1:1 male to female ratio. At time of insertion, candidal count of the patients was zero for all patients while after one month of wearing complete dentures candidal count was zero (0) in 26 (65%) patients, 5 (12.5 %) have 200 to 3000 candidal count, 9 (22.5%) patients have more than 3000 count. Change in candidal count was significantly higher after one month of wearing complete dentures. (Table I)

**Table I: Comparison of presence of candidal at the time of insertion and after one month of wearing complete Dentures**

Candidal outcome	A time of Insertion	After one month of wearing complete dentures	P. Value
Negative	40 (100 %)	26 (65 %)	0.0001
Positive	0 (0 %)	14 (35 %)	

## DISCUSSION

For this study, the sampling method used for candida in oral cavity was oral rinse technique. This technique has been extensively used and it provides a count of the candidal carriage. Another study compared oral rinse technique to that of imprint culture for detection of oral

microorganisms and revealed that oral rinse technique is a better one for yeast isolation. This technique was verified to be the most sensitive and ideal technique to determine overall candidal carriage.

The result of our study showed that wearing complete dentures significantly increased the candidal carriage, which has also been observed in another study.<sup>1,2</sup> According to a study by Alkumru and Beydemir,<sup>13</sup> wearing denture or removable partial denture is as an important factor for increasing candidal carrier rate. This is in accordance with our study results. Coelho et al,<sup>14</sup> also showed significant association between denture type and candida colony forming unit count. Abu-Elteen and Abu Alteen,<sup>15</sup> determined the prevalence of *Candida albicans* in 230 complete denture wearers and found candidal presence to be high in 78.3 % complete denture patients.

## CONCLUSION

The results of present study revealed that there is a significant quantitative increase in the candidal count after complete denture wearing.

## REFERENCES

- Dhir G, BerzinsDrW, Dhuru V.B Peruatham by AR, Denti No. A. Physical properties of denture base resins potentially resistant to Candidal adhesion. *J.Prosthodont* 2007; 16:465-72
- Nikawa H, Hamada T, Yama moto T. Denture plaque past and recent concerns. *JDetn* 1998; 26:299-304
- Nikawa H, Egusa H, Makihara S, Yamashiro H, Fukushima HJ, NC Nishimara M Pudji R R, Hamada T. Alteration of coadharence of *Candida Alnicans* with oral bacteria by dietary sugars. *Oval Microbial MM UNOL* 2001;16:279-83
- Scnaviratne C J, Jim L, Samaranayake L P. Bio film life style of *Candida* ; amini review. *Oval Dis* 2008;14:582-90
- Hexy, Meurman 3 H, Kari K, Rautemaa R, Samaranayake L P. Invitro adhesion of candida species to denture base materials. *Mycosis* 2006;49:80-4
- Kulaky Y, Arikan A, Albak S, Okar I, Kazazoglu E. Scanning electron microscopic examination of dent cleaners. Surface Contaminant removal from dentures. *J Oval Rchabil* 1997;24:209-15
- Segal E. *Candida*, still number one-what to do we know and where are we going from there? *Mycoses* 2005;48:3-11
- HexyMeurman J H, Kavc K, Rautemaa R, Samaranayake L P. Invitro adhesion of *Candida* Species to denture base material. *Mycoses* 2006; 49:80-4
- Perezous L F, Slevenson G C, Flaitz C M, Goldschmidt ME, Engeimeier R L, Nicholas C M. The effect of complete dentures with a metal palate on candida

- species growth in HIV infected patients. *J Prothodont* 2006;15:306-15
10. Darwazeh A M, Al-Rafai S, Al Mojaiwel S. Isolation of Candida Species from the oral cavity and fingerprints of complete denture wearers. *J Prosthet Dent* 2001; 86:420-3
  11. Campisi G, Pizzo G, Millici M E, Mancuso S, Margiotta V. Candidal carriage in the oral cavity of human immunodeficiency virus infected subjects. *Oralsurg Oval Mid Oval Pathol Oval Radiol Endod* 2002; 93:281-612.
  12. Ikebe K, Moril K, Matsuda K, Hata K, Nokubi T. Association of candidal activity with denture use and salivary flow in symptom-free adults over 60 years. *J Oval Rehabil* 2006; 33:36-42
  13. Alkumru H N, Beydemier K. The prevalence of candida albicans in complete denture and removeable partial denture wearers. A comparative study. *J Marmara UnivdentFac* 1992; 1:218-22
  14. Coelho C M, Sousa Y T, Dare A M. Denture-related oral mucosal lesions in a Brazilian school of dentistry. *J Oval Rehabil* 2004; 31:135-9
  15. Abu-Elteen K H , Abu Alteen R M. The prevalence of Candida Albican populations in the months of complete denture wearers. *New Microbiol* 1998; 21:41-8