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Diagnostic study on denture stomatitis, and its treatment

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Abstract
The current research includes a diagnostic study of stomatitis that occurs by dentures, mentioning the most important causes of inflammation and classifying them according to its type, severity, impact on the patient, and appropriate treatment methods. In order to treat this disease and maintain oral and dental health, some necessary steps must be followed. These steps are to clean the dentures and keep them in the liquid designated for them during bedtime at night. In addition, food and drink also have a direct effect that may lead to stomatitis, so the research included an accurate diagnosis of the disease in order to find out which of the treatments is appropriate for the condition that occurred and at what stage of the disease according to the development and severity of the condition. The morphological and microscopic diagnosis reveals to us the type of microorganisms that cause stomatitis, which is often fungal, represented by *Candida species*, which causes inflammation of the mucous membrane.

Keywords: denture stomatitis, candida species, treatment

Introduction

Since the oral cavity is considered the first stop of the digestive system, so many problems related to human teeth may occur in it, as it produces many activities and functionally different mechanisms in the process of digesting food entering the body through the mouth. On this basis, there are many reasons that lead to the occurrence of these problems that are related to the teeth. These reasons may be biological, caused by microbes that transform in their presence in the oral cavity from normal coexistence to pathogens that generate certain diseases that appear and become evident during diagnosis, or these may be the reasons are chemical, such as increasing the concentration of fluoride in water and food, or other reasons may be related to various matters, the most important of which is dentures. This case occurs among the elderly more than other groups of society, as they are the most layer wearing dentures, and for one reason or another, it may be the main cause of stomatitis. Denture stomatitis is a common case in dentistry, and it is a represented by an inflammation that accompanied by redness of the oral mucosa in the place under the dentures. Through many research studies it has been shown that about (90%) of cases of stomatitis are caused by *Candida species* [1], which is usually a harmless oral micro biome in many people. Denture-associated stomatitis is the most common infection of oral candidiasis (yeast infection in the mouth). It occurs more often in the elderly, especially those who have complete dentures. It may develop due to the denture being left in the mouth constantly, so it must be removed while sleeping, as well as when the denture is not cleaned in regular times. Maximum naturally occurring microbes grow on the external surfaces in the compose of biofilm, so the dental plaque is a clear example of this phenomenon. It is currently renowned as phenotype, this is of great clinical relevance, particularly due to the increase in biofilm resistance to antimicrobial agents [2, 3], which lead to inflammation around the teeth that called as stomatitis. Some patients suffer from obvious swelling and redness in the lining of the mouth, and painful ulcers may be generated. These ulcers form a hole in the lining of the mouth when the upper layer of its cells breaks. Many of the ulcers that occur are red in color, but some of them are white in color, due to dead cells and food waste that accumulate in their center. These symptoms lead to inflammation of the mouth and the tissues that surround the teeth in particular. Some ulcers are filled with fluid (in this case they are known as vesicles or bullae, varying in size). And in rare cases, in a few cases the mouth appears normal, but in most cases, patients show clear symptoms of inflammation in the mouth known as (burning mouth syndrome).

patients and clinical appearance

Diagnosis often depends on the clinical appearance of the patient with stomatitis, and swabs are taken from the surface of the dentures in order to examine them and verify the condition accurately to find out the main cause of the infection. In addition to investigations from the patient whether he has diabetes or any other disease or not, because it is necessary to treat and avoid other side diseases before treating denture stomatitis. However, epithelial evidence seen is the measure of proliferative or degenerative responses, and reduction of keratinization and epithelial atrophy, tissue biopsy is not usually indicated [1, 4] In addition to the clinical examination of the patient who suffers from stomatitis, the denture must be examined carefully and it should be noted whether it has been exposed to something that changes its specifications, or whether its quality is poor, so there are several methods and types through which dentures can be made. For example, the removable denture may be flexible and easy for the patient to wear. This quality is more efficient than others that are rigid. Stomatitis may occur due to the metallic material that makes up the wire used to fasten the denture. Although this condition is called (denture sore mouth), it is regarded as mostly painless and asymptomatic case. But the appearance of the involved mucosal layer is erythematous (red) and edematous (swollen)**.** It's sometimes related with petechial hemorrhage (pin points of bleeding) [3]. This is usually occurring directly beneath an upper denture. Sometimes

angular cheilitis can multiply, which is inflammation located on the corners of the mouth, and often after a microscopic-examinations, it shown associated with *Candida albicans*. But in some conditions, stomatitis is rarely developing in the position under a lower denture [2]. The affected mucosa is often severely defined, in the form of the covered denture.

A statistical aspect and results

The statistics of ten clinics in Karbala city center are documented for the period from 10/1/2021 to 10/1/2022, after clinical and microscopic diagnosis in some cases, there is a significant difference between cases and stages of each case type according to the results that are recorded. According to Newton's classification, denture stomatitis is divided into three types according to the severity and its effect on the oral tissue. Therefore, the first type of stomatitis is the one that represents an early stage of the condition, while the second type is the most frequent and common, but the third type is the type that is mostly uncommon, they are:

The first type: It is represented by clearly visible local inflammation or specific hyperemia (hyperemia).

The second type: It is the one that is (erythema) or (redness), and it is the most common type that includes part or all of the mucous membrane covered by the denture.

Type third type: It is an inflammatory nodular inflammation, in which papillary hyperplasia (hyperplasia) is often evident, occurring in the central hard palate and the alveolar ridge.

Table 1: To shows the three types of stomatitis for the time period from (10/1/2021 to 10/1/2022), in ten dental clinics in Karbala city

Clinic no.	The first type	The second type	Type third type
1	105	250	17
2	120	168	67
3	106	174	59
4	75	142	13
5	52	215	53
6	109	73	16
7	92	97	48
8	58	204	34
9	140	250	71
10	158	194	36

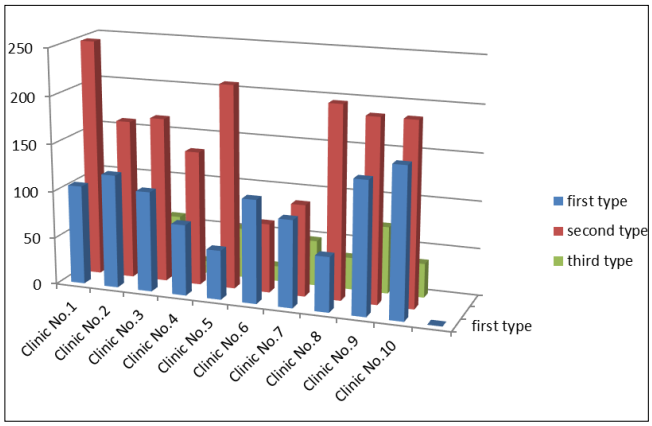

Fig1: To illustrate clinic numbers of stomatitis types for the time period from (10/1/2021 to 10/1/2022), in Karbala city:

Table No. 2: Test of Homogeneity of Variances for three Samples, to show non significant differences between them:

Levene Statistic	df1	df2	Sig.
3.686	2	27	.038

Means Plots

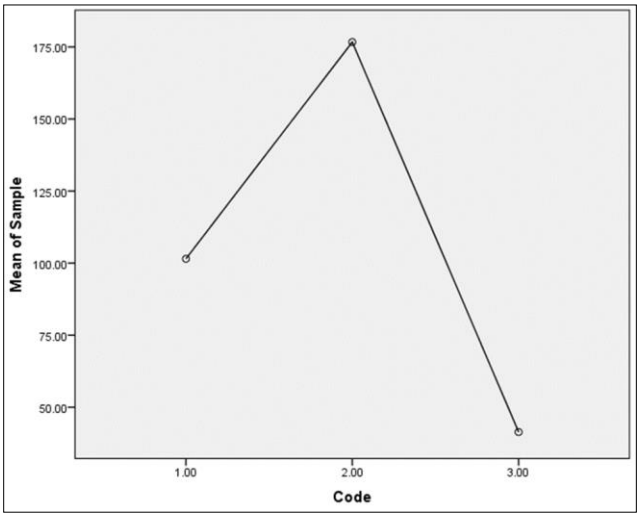

Fig 2: To illustrate the means plots of three sample types of clinic numbers

Discussion

The important thing that must be mentioned in relation to stomatitis and teeth is the presence of a group of different types of microorganisms inside the mouth, including yeasts, the most prominent of which is *Candida albicans*, as they are naturally present in the oral cavity. Patients who suffer from a weakened immune system, as in patients with AIDS, and other conditions such as a defect in the health of the mouth and teeth. In certain circumstances, *Candida* can be pathogenic and cause the appearance of white spots that scrape it to destroy the surface layer of the lining of the mouth. The severity of this disease depends upon microbial plaque formation, and periodontal pocket [5, 6], this is lead to tooth loss. The severity and type of disease stage may be influenced by the anatomy of the tooth, in addition to the restorative or endodontic condition in each case [7]. The comparison shown in (table no. 1) of cases of stomatitis of the three types, in 10 specialized dental clinics, as shown in (figure no. 1), is in order to show the correlation between the three types of stomatitis. It has been proven that there are no significant differences for these species according to the statistical study that we carried out as in (table no. 2), that is, there is no correlation between each of them. Evidence for this is also shown in (figure no. 2) through the graph that shows the means plots of the samples to each type of stomatitis. In many cases, some infection with syphilis leads to the appearance of a red, but painless sore of the mouth, lips, or teeth, during the early stages of the infection. There are some unknown pathogens, which are believed to be due to trauma and improper hygiene. There are also physiological factors, as in hormonal factors (8). Ulcers generated due to a certain defect in the oral cavity or teeth usually heal after several weeks, but if the defect leads to inflammation around the teeth, then this needs an accurate diagnosis to find out the cause of the defect and treat it. In the event that the disease is neglected and not treated, then approximately (4 to 10 weeks) later, a clear

white area (mucosa) will appear on the lip or inside the mouth, which may develop into a more complex stage. Both ulcers and mucous plaque formed as a result of stomatitis are highly contagious, and kissing can easily transmit the disease at this stage. It is possible for any kind of damage or injury to the tissue of the mouth and teeth, for example, accidentally biting the insides of the cheeks or the dentures not fitting properly within the mouth, to cause the appearance of wounds or ulcers, and thus vesicles within the mouth. In many cases, the membrane covering the bulla ruptures, leaving an ulcer in its place. There is a significant development of the microbial film more severe in smokers than in non-smokers, so stomatitis may occur and be worse due to the smoking habit [9]. There are many types of diagnostic methods for the detection of stomatitis represented by radiography, vitality test, and other tests [10]. Various foods or chemicals can trigger an allergic reaction, which leads to mouth ulcers. Acidic foods, irritating flavors, and astringent substances can cause stomatitis in particular, as is the case for commonly used materials, such as toothpaste, mouthwash, and some types of candy and chewing gum.

Treatment

Among the most important aspect of the denture stomatitis treatment is improving denture hygiene (because the nature and type of food directly affects the health of the mouth and teeth.), and removing the denture at the time of night, as well as its (cleaning, and disinfecting), and store it in an antiseptic solution overnight. This is very important because of the present of *C. albicans* with the denture which will cause reinfection when it isn't removed and cleaned. The main substances which must be used includes some solutions of alkaline peroxides, alkaline hypochlorites, such as: (hypochlorite), acids such as: (benzoic acid), yeast lytic enzymes and proteolytic enzymes such as: (alcalase protease). The other aspect of the stomatitis treatment is involved the resolution of the infection which occur in mucosal layer, for which topical anti-fungal medications are utilized, such as: (nystatin amphotericin, fluconazole\itraconazole, miconazole). Usually an anti-microbial mouth wash used, such as: (chlorhexidine) is concurrently used when needed. Possible under lying disease (diabetes, and\or HIV) should be treated as a step of stomatitis treated [1].

Conclusions

Through our research, it is concluded that there are many causes of stomatitis, and these causes are subject to the conditions that the mouth is exposed to, such as foods, general health and hygiene, in addition to the traumas that the oral cavity and teeth are exposed to physiological and hormonal factors also have a role in the occurrence of the disease, oral infection sometimes. It is also concluded through our study that the number and type of pathological condition represented by stomatitis does not affect the correlation between each dental clinic, and there are also no significant differences between each of the three types of cases. It is also concluded through our study that the number and type of pathological condition represented by stomatitis does not affect the correlation between each dental clinic, as well as there are no significant differences between each of the three types of cases, and there is an appropriate treatment for each case according to its kind.

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