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REVIEW PAPER

Etiology and Management of Inflammatory Papillary Hyperplasia in Completely Edentulous Patients - A Review

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Abstract

Oral mucosa of complete denture wearing patients is subjected to varying amount of stresses as compared to patient having natural teeth. This can leads to different type of oral mucosal lesions like denture stomatitis, epulis fissuratum, angular cheilitis, traumatic ulcers, inflammatory papillary hyperplasia (IPH) etc. IPH is a type of chronic inflammatory proliferative lesion characterized by numerous small, wart like edematous red papillary growth most commonly seen in deepest part of the palate. Review of literature suggest denture associated widely distributed etiology for IPH like over accentuation of palatal relief and vacuum chamber in upper denture, old ill fitting dentures, poor denture hygiene, continuous denture wearing habit, faulty occlusion, skidding of instable denture etc. Treatment for IPH varies with the severity of the condition and may range from conservative to surgical depending on clinical presentation. Conservative approach include discontinuing use of ill fitting denture, correction of faulty prostheses, improving the oral and denture hygiene and antifungal drugs. However, the surgical approach is used when the lesion is more aggressive and this include supraperiosteal excision, resesctive surgery, cryotherapy, and electrosurgery, blade-loop surgery, fulguration, and mucoabrasion or laser surgery. As a method of prevention patient should be advised to avoid continuous day and night wearing of denture. Additionally, avoid providing excessive relief in the palatal region, as these areas become site for bacterial and fungal colonization. Patients should be well motivated for proper care and maintenance of denture hygiene and also for the importance of periodic dental visits and follow-ups.

Keywords: Inflammatory papillary hyperplasia, Denture hygiene, Relief areas, Vacuum chamber, Suction disc, Cryotherapy, Laser surgery.

1 | INTRODUCTION

Due to the increasing elderly population worldwide, many edentulous and partially dentulous patients are seeking to prosthodontic treatment. As these patients are denture wearers, a variety of changes are seen in their oral mucosa as compared to the patients bearing natural dentition. Their tissues are subjected to varying amounts of stresses which they are not designed to bear. This leads to various proliferative changes in the oral mucosa like inflammatory papillary hyperplasia, epulis fissuratum, traumatic fibroma etc. The presence of dentures creates a new changed environment for the oral microflora due to the presence of plaque on the denture surface and also between the mucosa and denture surface.

Oral mucosal lesions associated with dentures can be chronic reactions like inflammatory papillary hyperplasia (IPH). (1) It is a characterized by one or more nodular lesions, mostly involving the hard palate and rarely seen in the mandible. (2) This review article explains about such lesions occurring in the oral cavity, associated with the complete dentures.

2 | CLINICAL FEATURES

Clinically IPH may be seen under an upper or lower partial or complete denture, but in majority of cases it is seen on the hard palate and is associated with complete dentures. (3) On the hard palate, there is predilection for the involvement of the deepest portion of the palate. The area of tissue involvement corresponds to the area of palatal portion covered by the denture base. (4) The lesion is characterized by development of numerous small, wart like, edematous, red papillary growths and it is usually asymptomatic.

3 | HISTOPATHOLOGIC FEATURES

The microscopic features of inflammatory papillary hyperplasia show numerous papillary growth of the oral mucosa, with or without chronic inflammation. They are usually covered by parakeratotic stratified squamous epithelium. The deeper aspects of the epithelium show pseudoepitheliomatous hyperplasias or the formation of keratin pearls and microcysts. The keratin pearls may also develop calcification. The epithelium is supported by hyperplastic central cores of well vascularized connective tissue which shows edema, myxomatous degeneration, plasma cells and lymphocytic infiltration. Rarely, polymorphonuclear lymphocytes, cartilage or calcification is seen in the connective tissue. (3)

4 | PREVALANCE

Guernsey in a series of 5,892 dental patients, reported an incidence of 0.8% to 4% of inflammatory papillary hyperplasia in denture wearers in all age groups with an average of 2.9%. In non-denture wearers it was only 0.2%. (5) However, Bhaskar and his associates have stated that approximately 20% of the patients who wore dentures 24 hours a day show papillary hyperplasia, while the prevalence is 10% among all denture wearers. (3) Ettinger in his study of etiology of inflammatory papillary hyperplasia in 700 patients, reported a similar occurrence in 97 affected patients with the prevalence rate of 13.9%. (6)

5 | ETIOLOGY

The etiology of inflammatory papillary hyperplasia is widely distributed and yet unclear, even though investigated upon both clinically and histopathologically. The following have been suggested as the most probable causes of IPH: (1) over accentuation of palatal relief area (6), as the size and extent of

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the lesion corresponds to the configuration of palatal relief areas. Fairchild said that in high percentage of patients in whom a void existed between denture and palatal tissue, can be a significant factor in the development of inflammatory papillary hyperplasia. He also said that it can be postulated, that denture base resins and metals create their own void between palate and the denture base material and the irritation caused by the presence of this void between the palate and denture, promotes the development of inflammatory papillary hyperplasia in a similar manner as relief chamber does (6, 7). (2) 'Incorrect bite' and 'malocclusion' existing in the denture, which causes excessive movement of dentures when in function (6, 8) (3) ill-fitting dentures (poor retention and stability of the dentures) and poorly adapted tongue to the denture base. Canger et al concluded that ill- fitting dentures for more than 10 years to be a most significant risk factor for IPH (9). Robinson and Schmitz have mentioned that continuous rubbing of ill-fitting denture against the denture bearing mucosa to be a cause of IPH (10) (4) irritation due to sharp outlines of the vacuum chamber and negative pressure created by the suction discs placed on the palatal mucosal surface, which reduces the blood circulation and produces hypoxic effects which predisposes to fungal infection. Atashrazam et al studied 2011 complete denture patients of which 31 cases had IPH and all maxillary dentures had presence of suction discs. (11) (5) skidding of the denture bases due to the 'lateral stresses', or frictional movement of the denture (6) poor denture hygiene and the presence of denture plaque, calculus and stains (6) (7) use of proprietary solutions to clean dentures which cause chemical irritation. Fisher et al and Koissioni noted that the frequency of denture cleaning was related to IPH (2) (8) number of years patient has worn the denture (9) continuous wearing of the dentures both day and night, or "round the clock wearing" of the dentures (10) irritation of the palatal salivary glands which can lead to decreased salivary flow. (6) Predisposing factors like, smoking, use of tobacco, alcohol consumption, Candidal infection, patients wearing a maxillary complete denture against a mandibular distal extension partial denture, sex of the patient and various systemic diseases like diabetes mellitus are considered to be responsible for IPH. Dos Santos et al observed that patients with IPH were 70 years or more older, were smokers and lived in rural areas. Al-Dwairi suggested a close relationship between smoking and IPH. (2)

6 | MANAGEMENT

IPH is an irreversible condition. However, the condition can be prevented if, the patients avoid continuous wearing of the dentures and leave the dentures out for some period of time, especially during night, maintain proper denture hygiene by cleaning them with water and brush and soap. Clean dentures regularly by soaking them in denture cleansers like 2% sodium hypochlorite or 2% chlorhexidine gluconate or alkaline peroxide solutions like Efferdent and Polident. (12) Additionally, the dentists should avoid providing excessive relief in the palatal region, as these areas become site for bacterial and fungal colonization. They should also educate the patient for proper maintenance of denture hygiene and the importance of periodic dental visits and follow-ups. Also they should take the appropriate treatment if such lesions are encountered.

The type of treatment for IPH varies with the severity of the condition. It can be either conservative or surgical, depending on the clinical presentation. Small localized lesion can be treated by antifungal medication, mouth rinses and gels or conservative surgery. The local (like Amphotericin B, 2% miconazole gel) or systemic (like Fluconazole) method of delivery did not make much difference (13) Salonen in his study to determine the effects of local and systemic antifungal treatment accompanied with renewal of dentures on 49 subjects found that 64% of subjects showed positive healing and the results were commoner in women than in men. (13) However, the surgical approach is used when the lesion is more aggressive and large papillary growth is present. These include supraperiosteal excision, resesctive surgery, cryotherapy, and electrosurgery, blade-loop surgery, fulguration, and mucoabrasion or laser surgery. (14)

The surgical mode of intervention remains the standard in treating severe forms of IPH. In surgical treatment, two common modes of treatment are electrosurgery and use of razor-moved blade cutting,

referred to as "Uohara knife" and "Pacquette knife" or blade loop knife. (15) Rathofer et al in his study conducted on 21 patients, to compare healing and pain following electrosurgery and blade-loop knives, found that majority of subjects did not perceive a difference in discomfort with either of the technique on the day of electrosurgery or at any time during follow-up. (15) Cryosurgery is also an effective, non-anesthetic, painless method for removal of inflammatory papillary hyperplasia. Getter in his study on 12 patients of IPH, found that the technique has advantages like: intact oral mucosa at the end of surgery, minimal postoperative discomfort, no offensive odor or post-operative bleeding, no contamination of the operator and operating site with high-speed rotary instruments. (16) The advantages of CO_2 laser surgery are precise limits of the surgical field, minimal bleeding, and relative absence of post-operative pain and accelerated healing at the site. (17) When the surgical approach is used, it is necessary to include 2 to 5 mm of the surrounding area so all lesion is removed from the target area. Regardless of lesion severity, reline of previous prosthesis or construction of new dentures, should be employed.

7 | DISCUSSION

IPH is chronic inflammatory proliferative lesion most commonly seen in palatal oral mucosa with variety of clinic features. Generally the lesion can be described to have the appearance, as "scotch-grained," "grape-like cluster," "warty," or consisting of multiple lumps. Some areas of the lesion may be distinctly nodular and present large flattened elevations and other areas may be papillary resembling raspberry. (3) Another type of the papillary hyperplasia, is described to have mossy or velvet like appearance having minute elevations. The color of the lesion may vary from pink, as seen in normal mucosa, to various gradations of red. Clinically the lesion may show classical signs of inflammation, i.e. redness and swelling, seen in secondary infection by *C. Albicans*. (18) The mucous membrane surrounding the papillary growth may be red, spongy, boggy or flabby in appearance, but with little pain. Development of ulceration in the lesion is rare; however intense erythema at times may give the appearance of erosion.

The histological features of IPH show numerous papillary growth of oral mucosa, with or without secondary inflammation with parakeratotic stratified squamous epithelium covering. The underlying connective tissue may show cells of secondary inflammation like polymorphonuclear leukocytes, lymphocytes, and plasma cells. (4) However, when the lesion approaches the mucous palatal glands, secondary changes in the glandular parenchyma and stroma are seen. Such changes include atrophy of acini, interstitial fibrosis, squamous metaplasia of ducts, and accumulation of small pools of mucoid secretions. These secondary features may give the lesion, the appearance of mucoepidermoid tumor. (3)

Schmitz in his study found that IPH is seen in patients wearing complete dentures, partial dentures and in the mouths who have not worn the dentures with frictional irritation as the primary causative factor. (10) He also stated that IPH occurs even when the relief chambers were present or absent and also the lesion was not confined to the area covered by relief chamber. Lambson also in his study found that palatal relief failed to provide conclusive etiology. In the 301 patients, studied, he found that none of the lesion entirely to the relief area, but also extended beyond the borders. He also found that 144 (48 %) wore the dentures only during waking hours and none of these patients had the lesion and of the remaining 152 (52%) patients, 32 (20%) had IPH. (18, 19) Ettinger in his study found palatal vault as the site to have highest predilection. He also found that incidence of exostosis and continuous wearing of denture both day and night was significantly higher in patients with IPH. Peyton and Anthony, and Giglio and associates have shown that dimensional change in the palatal part of the heat cure acrylic denture, which occurs during processing, shows a significant discrepancy between the palatal crest and the denture base material.

Bhaskar in his study of evaluation of surgical report of 341 patients found that the lesion occurred had predilection for occurrence in men than in women with the patients in their third, fourth and fifth decade

of life. (3) However, Coelho et al found gender to be a significant factor with a high prevalence rate in females which can be attributed to, that females live longer than men, more women wear dentures and due to postmenopausal changes taking place in oral mucosa, predisposes to the development of IPH. (20) Orenstein reported a case of 10 year old female patient, with a single nodule appearing on the hard palate. The oral examination revealed, poor oral hygiene and the patient was the mouth breather (12)

8 | CONCLUSION

The etiology of IPH is widely distributed with a variety of factors involved. Chronic irritation, poor denture hygiene, continuous denture wearing, and many other factors play a significant role. As a method of prevention, patient should stop nocturnal wearing of denture and should be advised to stop continuing the use of old dentures. New dentures should be constructed and they must not be employed with suction discs or vacuum chambers. Surgical treatment is employed in extensive cases. All the specimen of the tissue should be tested to rule out whether the malignancy existed or not, regardless of type of treatment employed.

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