Denture Injury and Associated Oral Tissue Changes: A Review

Neema Balan[1], Roshin C.N[2], Selvamani. M[3], Ceena Denny. E[4], Bastian T.S[5], Raj A.C[6]

[1]PG Student, [2]Senior Lecturer, Department of Oral Pathology and Microbiology, [3]Professor, Department of Oral Pathology and Microbiology, Mahe Institute of Dental Sciences and Hospital, Mahe, [4]Associate Professor, Department of Oral Medicine & Radiology, Manipal College of Dental Sciences, Mangalore, Karnataka, [5]Professor and HOD, Department of Oral Pathology and Microbiology, Mahe Institute of Dental Sciences and Hospital, Mahe, [6]Professor, Department of Oral Medicine & Radiology, Mahe Institute of Dental Sciences and Hospital, Mahe

Abstract

Much more than an aesthetic or functional restoration of missing teeth, a 'Prosthesis' or a 'Denture' plays an inevitable role in maintaining an individual's self-confidence. Though there are many psychological reasons for acceptance or reluctance of dentures, there are certain real physical injuries and pathologies that can occur post denture insertion. Oral changes in such injuries will be discussed here in this review.

Key words: *Denture Stomatitis, Denture Sore Mouth, Epulis Fissuratum, Palatal Papillomatosis, Denture Base Intolerance.*

Introduction

Oral mucosa may be subjected to a variety of injuries on wearing removable dentures. They manifest in the oral mucosa as traumatic ulcers, inflammation and hyperplasia[1]. Of these the most common is the traumatic ulcers[2]. Mucosal inflammation is also seen commonly in denture wearers; can be broadly categorized into local, generalized, papillomatous types. Inflammatory lesions are often associated with microbial plaque and *Candida albicans*. Poor retention of denture, lack of mucosal resistance, systemic or endocrine disorders, poor denture hygiene, prolonged and day and night wearing of dentures and even poor nutrition plays a key role in the development of inflammation[3].Acrylic intolerance and allergy to denture adhesives are also frequently reported[1,4].

Corresponding Author:
Dr. Neema Balan
Third year PG student, Department of oral pathology & microbiology, Mahe Institute of Dental Sciences and Hospital, Mahe(U.T of Pondicherry). Pin- 673310.
Mob: 9562536050
email-ullasneema80@gmail.com

Traumatic Ulcers: Traumatic ulcers generally occur one or two days after the insertion of a new denture[1,2]. They results from a 'high spot' at the denture base, over extended flanges or due to a bony spicule under the denture[1]. **Clinically**, traumatic ulcers of denture injury exhibit small, irregularly shaped painful ulcers with a delicate grey necrotic covering. This is usually surrounded by red inflammatory halo. **Microscopically** traumatic ulcers show loss of continuity in the surface epithelium. Epithelium at the ulcer borders shows proliferation. Underlying connective tissue shows increased number of fibroblasts and blood capillaries. Dense inflammatory infiltrate of neutrophils is present which in chronic stages are replaced by lymphocytes and plasma cells[1]. Identification and correction of the underlying cause helps in the healing of ulcer [1,2].

Denture Stomatitis or Denture Sore Mouth

Generalized inflammation in denture injuries are commonly known as Denture Stomatitis or Denture Sore Mouth. It is associated with poor denture hygiene, prolonged denture wearing, trauma from the denture and other systemic and nutritional factors.

Majority of the cases presents with *candida albicans* infection[1]. Candida albicans is a usual commensal present in the oral cavity and turn to be pathogenic under the presence of risk factors[5].

Figure 1: Denture sore mouth

Clinically the lesion presents with extremely red, swollen mucosa underlying the denture with a smooth or granular surface. Inflammation involving maxilla may exhibit multiple pinpoint foci of hyperaemia[1](figure:1).

Based on the severity of the lesions, Newton (1962) classified denture stomatitis into three classes[6,7].

1. 2. Class I/ Punctiform Hyperemia- early stage of the denture stomatitis characterized by localized or pinpoint hyperemia.

3. Class II / Diffuse Hyperemia -Diffuse hyperaemia of the denture-supporting tissues. It is considered the most common aspect of Candida Associated Denture Stomatitis

4. Class III / Granular Hyperemia -more common indentures with suction chambers. Affect the central region of the palate, with rough and nodular appearance of the mucosa (papillary hyperplasia[6,7].

Based on Newton's classification, Budtz–Jorgensen and Bertram in 1970 and Bergendal and Isacson in 1983 proposed other classifications of denture stomatitis. Budtz-Jorgensen & Bertram (1970) classified denture stomatis as (1) simple localized inflammation, (2) simple diffuse (generalized) inflammation, and (3) granular inflammation. Bergendal (1982) classified them as(1) atrophic denture stomatitis and (2) hyperplastic denture stomatitis[7].

Denture stomatis is frequently(33-82.6%cases) associated with angular chelitis[7].

Treatment includes topical antifungal application[8]. Nystatin tablets (500,000 units) are made to dissolve in the mouth thrice a day for 14 days duration. Old dentures can be sterilized overnight in Nystatin solution during this period. Proper denture hygiene instructions, advice for new dentures in pronged denture wearers and rebasing of denture bases with soft- tissue are also useful[1]. Other antifungal agents are also equally effective. Use of Chlorhexidine digluconate mouthwash (0.12%) is also found effective in eliminating *Candida albicans* from the dentures of patients with denture stomatitis[8]. In case the treatment fails, systemic conditions should be considered[9].

Inflammatory Fibrous Hyperplasia

Inflammatory fibrous hyperplasia is also known by the names; Denture Injury Tumor, Epulis Fissuratum or Redundant Tissue. They present in the oral mucosa as hyperplasia, in response to tissue injuries from chronic ill-fitting dentures. Hyperplasia are often seen in the areas of chronic irritation such as gingival, buccal mucosa and angle of mouth[1].

Clinically they appear as single or multiple folds of hyperplastic tissue, lying in the alveolar vestibule. These folds are normal in colour, firm in consistency with a smooth surface texture. They may ulcerate and inflammation can be seen in deeper areas[1,10].

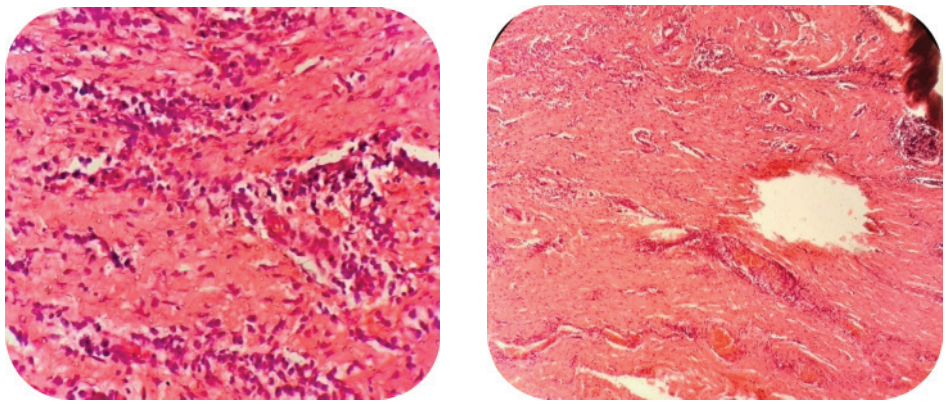

Figure: 2, INFLAMMATORY FIBROUS HYPERPLASIA: Hyperplastic mass composed of excessive bulk of connective tissue coarse collagen bundles, fibroblasts, blood capillaries and chronic inflammatory cells. H&E;10x,40x.

Microscopically, a hyperplastic mass of tissue composed of excessive bulk of connective tissue covered by epithelial lining can be seen. The epithelium is stratified squamous epithelium which may sometimes exhibit acanthosis. Pseudoepi the liomatous hyperplasia and hyperkeratosis are also frequently noted. Connective tissue consists of coarse collagen bundles with few fibroblasts or blood capillaries[1](figure:2).

Treatment includes surgical excision of hyperplastic tissue followed by new denture construction[1]

Inflammatory Papillary Hyperplasia (Palatal Papillomatosis)

Inflammatory papillary hyperplasia is an inflammatory hyperplasia associated with ill-fitting dentures, commonly seen in palatal mucosa. It is often associated with chronic hyperplastic candidiasis[1].

Figure 3: Inflammatory papillary hyperplasia or Palatal papillomatosis

Clinically, the lesion presents as numerous closely arranged papillary projections which are edematous, involving almost the figure 3 whole of hard palate imparting a warty appearance[1]. individual papillae usually measures less than 2mm or less. In rare cases mandible may be involved. They are usually asymptomatic. The mucosa appears pink to red in colour, with varying degrees of inflammation and rarely exhibiting any ulceration[1,11].

Microscopically, numerous small vertical projections composed of epithelium and central core of connective can be seen. Epithelium is stratified squamous orthokeratinized or Para keratinized epithelium. They are often confused for epidermoid carcinoma and can be rule out on the basis of lack of dysplastic features. Connective tissue shows severe inflammatory infiltration[1,11]. **Treatment:** Discontinuing ill-fitting dentures, surgical removal of the lesion followed by new denture construction forms the best line of treatment[1].

Denture Base Intolerance or Allergy

Allergic reactions to acrylic are less common and are usually of delayed or contact allergy.The first case of acrylic hypersensitivity was reported in 1941. This is also called stomatitis venenata. Allergy to dental resin-based materials is due to reaction in the resin matrix like monomers (e.g. methyl methacrylate and triethylene glycol dimethacrylate).

Figure 4: Denture base allergy

The antigens from the denture base come in contact with the epithelial cells to form haptens that bind to Langerhans cells and present the antigen to T-lymphocytes, thereby initiating inflammatory reaction. Symptoms include 'burning mouth', inflamed mucosa, erythema, papules, edema and in severe cases weeping blisters also appear (figure:4).Soaking the polymerized denture in 55°C water bath for 1 hour will help to reduce the residual monomer. There are various low allergen-free denture materials available to be used in these situations[12].

Allergy to Denture Adhesives:

Denture adhesives are materials in creams, pastes, and powder formswhich are used to enhance the retention, stability and function of prosthesis. Some constituents included in the composition of adhesives are reported to have deleteriouseffects on oral mucosa[4].

Conclusion

Proper identification of the exact risk factors involved with denture injuries and their appropriate management along with denture hygiene instructions and better patient education will help the dental practitioners in successfully treating the denture injuries**.**

Conflicts of Interest: Nil

Source of Support: Nil

Ethical Clearance: Not required

References

1. Sivapathasundharam B. Shafer's Textbook of Oral Pathology-E Book. Elsevier India; 2016.
2. Anura A. Traumatic oral mucosal lesions: a mini review and clinical update. Oral Health Dent Manag. 2014 Jun;13(2):254-9.
3. Shah AA, Ahmad TJ. Oral mucosal lesions in complete denture wearers. Journal of Pakistan Association of Dermatology. 2016 Dec 22;21(3):170-3.
4. de Gomes PS, Figueiral MH, Fernandes MH, Scully C. Cytotoxicity of denture adhesives. Clinical oral investigations. 2011 Dec 1;15(6):885-93.
5. de Vasconcellos AA, Gonçalves LM, Cury AA, da Silva WJ. Candida-associated denture stomatitis: Clinical relevant aspects. InOral Candidosis 2015 (pp. 53-57). Springer, Berlin, Heidelberg.
6. Hasan S. Denture stomatitis: A literature review. Journal of Orofacial & Health Sciences. 2015;6(2):65-9.
7. Arendorf TM, Walker DM. Denture stomatitis: a review. Journal of oral rehabilitation. 1987 May;14(3):217-27.
8. Martins KV, de Lacerda Gontijo SM. Treatment of denture stomatitis: literature review. Rev Bras Odontol. 2017;74(3):215-20.
9. Pattanaik S, Vikas BV, Pattanaik B, Sahu S, Lodam S. Denture Stomatitis: A literature review. Journal of Indian Academy of Oral Medicine and Radiology. 2010 Jul 1;22(3):136.
10. Khan MW, Shah AA. A Massive Denture Induced Hyperplastic Lesion in Maxilla. JPDA. 2019 Jan;28(01):48.
11. Gual-Vaqués P, Jané-Salas E, Egido-Moreno S, Ayuso-Montero R, Marí-Roig A, López-López J. Inflammatory papillary hyperplasia: A systematic review. Medicina oral, patologia oral y cirugia bucal. 2017 Jan;22(1):e36.
12. Choudhary A, Devanarayanan AS, Bali P, Choudhary E, Vikram J. Contact Allergy to Denture Resins and Its Alternative Options. Int J Oral Implantol Clin Res 2016;7(2):40-44.