

Saliva and its Prosthodontic Implications

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Abstract: The secretions of the major and minor salivary glands, together with gingival crevicular fluid constitute oral fluid which provides chemical milieu of the teeth and oral soft tissue. The environment of the oral cavity is to a large degree created and regulated by saliva. The fact that the teeth are in constant contact with and bathed by the saliva would suggest that this environmental agent could profoundly influence the state of oral health of a person. Saliva has manifold functions in protecting the integrity of the oral mucosa. Most often, the dentist is called upon to treat patients in whom he finds out a few of the symptoms and clinical signs of abnormal salivary secretions and function. Hence the knowledge of salivary glands, secretion and function is important in diagnosis, treatment planning and in predicting the prognosis.

Key words: Saliva • Oral Fluids • Glands • Dentures

INTRODUCTION

Saliva removes debris and damaging factors by transportation to oropharynx. Coats the soft tissues with film 0.1mm thick (Therefore to maximize physical retentive factors, any space between complete dentures and supporting tissues should not exceed this value). The rate of debris clearance depends on velocity of movement of film (0.8-8.0mm/minute, depending on salivary flow rate and environmental muscle activity [1]. Antimicrobial action most effective against non-commensal organisms [2]. Hydrophilic components lubricate, moisten and protect moving tissues in contact aided by pellicle formation. Especially important for denture wearers. Secretions of minor salivary glands are critical, senile dentures open onto all mucosal surfaces (Except anterior region of hard palate) [3].

Saliva plays an important role as a physical agent in the retention of complete dentures. The physical factors consist of: Adhesion, Cohesion, Surface tension, Capillary attraction and Atmospheric pressure.

- *Adhesion:* It is the physical molecular attraction of unlike surfaces in close contact. It acts when saliva wets and sticks to the basal surfaces of dentures and

at the same time to the mucous membrane of the basal seat. Effectiveness of adhesion depends upon close adaptation of denture base to the supporting tissues and fluidity of saliva [4].

- *Cohesion:* It is the molecular attraction between two similar surfaces in close contact. It occurs in the layer of saliva between the denture base and mucosa.
- *Interfacial surface tension:* It is the resistance to separation possessed by the film of liquid between two well adapted surfaces. It is found in the thin film of saliva between the denture base and the mucosa of basal seat.
- *Capillary attraction:* It is the force that causes the surface of liquid to become elevated or depressed when it is in contact with a solid. When the adaptation of denture base to mucosa on which its rests is sufficiently close, the space filled with a thin film of saliva acts like a capillary tube and helps retain the denture. Saliva as a physiological factor of retention affects the effectiveness of physical forces. The higher the viscosity occurring to the mucoid content, the lower the flow and greater is the fixation. Hence the mucous saliva provides better cohesion than serous saliva.

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Distribution of Saliva

Saliva May Be Distributed in One of the Three Ways:

- Saliva film covers all surfaces of the denture and the oral mucous membrane. With this distribution of saliva there is no meniscus and no contribution to retention by surface tension.
- The saliva film covers the oral mucous membrane but is incomplete over the polished surface of the denture. This distribution of saliva produces a meniscus and hence there is a retentive force due to surface tension.
- Saliva beneath the tissue basal surface of denture only. With this distribution of saliva, there is no meniscus and a considerable retentive force due to surface tension.

Excessive salivation particularly by maxillary and sublingual glands presents a problem in impression making. When this problem exists, atropin sulfate can be administered orally prior to impression making. The new dentures may feel like foreign bodies and stimulate the flow of saliva. The patient should be assured that the feeling and flow of saliva will decrease gradually. Excessive secretions of mucous from the palatal glands may distort the impression material in the posterior two thirds of the palate. To counteract this problem, the palate may be massaged to encourage the glands to empty, the mouth may be irrigated with an astringent mouthwash just prior to inserting impression material and the palate may be wiped with gauze [5].

Failure to counteract the thick and ropy saliva because of heavy secretions of mucous from palatal glands under maxillary denture will result in: Dislodgement of the denture, Presence of voids in the impression surface while the impression material sets, Forms a factor in causing the patient to gag while impressions are made and after placement of new dentures.

Ideally there should be a moderate flow of serous type saliva which seems to be the situation most frequently found. When it is determined that saliva is a problem, the cause should be investigated. If necessary, therapy should be instituted to correct the problem. When the cause is undetermined or there is no favourable response to therapy, the problem should be discussed with the patient prior to treatment so that by patients understanding, patient's cooperation is assured.

Xerostomia, presents some serious problems like the possibility of reduced retention increases, absence of saliva often causes cheeks and lips to stick the denture base in uncomfortable manner, intolerance to denture wear, problems in mastication, swallowing, speaking etc [6].

Management:

- The treatment will depend upon the nature of the disease and the cause should be detected and corrected.
- Adequate amount of saliva in the mouth is achieved by use of artificial saliva substitutes, such as saliva orthana, luborant and glandosane [7].
- Xerolube is also a salivary substitute.
- Drug related xerostomia can be minimized by lowering the dosage or changing the medication in consultation with the patients physician.
- Xerostomia associated burning is a complex management problem since patients with Sjogren's syndrome or those who have undergone radiation therapy are not able to regenerate salivary tissues. Salivary substitutes, transmucosal electro-stimulation and pilocarpine therapy may all be of some benefit.
- When all tests are negative, the diagnosis is idiopathic xerostomia. Psychosomatic origin must be considered and discussed with the patient. He or she must be assured that no organic disease is present.
- Chewing sugarless gum and sucking sugarless candies stimulate flow of residual function.
- Frequent sips of water and sucking ice chips diminish the discomfort.
- Aggressive use of oral hygiene measures, fluoride and antibacterial agents are essential to reduce the associated risks.

Prosthodontic Implications:

- The mechanical protection of the denture supporting tissues by the saliva film will be lost predisposing then to irritation. This dryness of the mucosa renders it more susceptible to frictional irritation from denture movement and may interfere with patients ability to wear the dentures [8].
- A decrease in salivary flow will interfere with denture retention since the saliva contributes to adhesion, cohesion, interfacial surface tension and capillarity.
- Difficulty in mastication and deglutition.

- The denture use should be limited to short periods.
- Restrict the diet to nutritious moist food that are soft or liquid.
- Good denture hygiene should be encouraged since xerostomia predisposes to candidiasis [9].

REFERENCES

1. Blahova Zora and Rolf Walstrom, 1971. Physical factors in retention of complete dentures. *J. Prosthet Dent*, 25: 230-5.
2. Boucher O. Carl, 2010. Bouchers prosthodontic treatment for edentulous patients, ed., (9): 45-8.
3. Edgar W.M. Saliva, 1992. Its secretion, composition and functions. *British Dental Journal* April, 25: 305-2.
4. Kristi Sydney and Chang Wue, 1992. Saliva: Its role in health and disease. *International Dental Journal*, 42: 291-304.
5. Heartwell M. Charles, 1992. Syllabus of complete dentures ed., (4): 89-92.
6. Lindstrom, R.E., 1979. Physical chemical aspects of denture retention and stability: A review of literature. *J. Prosthet Dent*, 42: 371-5.
7. Mardel, 1989. The role of saliva in maintaining oral haemostasis. *JADA*, 119: 298-304.
8. Niedermeier and U. Wilhelm, 1998. Salivary secretion and denture retention. *J. Prosthet Dent*, 67: 211-6.
9. Winkler Sheldon, 1996. Essentials of complete denture prosthodontics, ed., (2): 134-7.