

An innovative metal base denture design for a 55-year-old menopausal woman

Vishwas Bhatia, Garima Bhatia, Nitul Jain¹, Ashwani Kumar Jadon²

Departments of Prosthodontics and Crown Bridge, ¹Oral Pathology, ²Orthodontics, Eklavya Dental College and Hospital, Delhi-Jaipur Highway, Rajasthan, India

Address for correspondence:

Dr. Vishwas Bhatia, Department of Prosthodontics and Crown Bridge, Eklavya Dental College and Hospital, Delhi-Jaipur Highway, Rajasthan, India. E-mail: drvishprotho@gmail.com

Abstract

Menopause is a normal developmental stage in a woman's life, marking the permanent cessation of menstruation resulting from irreversible changes in the hormonal and reproductive functions of the ovaries and is associated with a large number of symptoms ranging from physical to psychological. Some of the common oral manifestations are oral burning sensation with associated mucosal infections, pain, altered taste perception, and alveolar bone loss. These symptoms may unfavorably affect oral health and treatment needs requiring dentists to devise newer methods that would add along to the treatment modalities advised by gynecologists in relieving menopausal women from above symptoms. The present case report describes an innovative method of fabricating a metal base denture in an edentulous female that would help perimenopausal/menopausal/post-menopausal

edentulous women feel hot/cold sensations of food/liquids, thereby giving them relief from pain, better taste perception, and relief from associated allergic and candidal infections that are common with conventional acrylic base dentures.

Key words: *Burning sensation, denture, innovative, menopause, metal base*

INTRODUCTION

Menopause refers to the permanent cessation of menstruation owing to loss of the ovarian follicular activity.^[1] A diagnosis of natural menopause is made retrospectively following 12 months of amenorrhea with no pathological association.^[1,2] However, menopause may be artificially induced by radiation, surgery, and chemotherapy.^[2]

Menopause usually occurs in the fifth decade of life in women.^[3] Factors that affect the age at onset of menopause include the body mass index, family history, ethnic origin, menarche, and previous oral contraceptive use.^[2] Obese or overweight women experience menopause later in life with fewer climacteric symptoms than thin women due to availability of estrogen in adipose tissues.^[3-5]

Menopause is accompanied by a number of characteristic physical changes; some of which occur in the oral cavity.^[6] Some of the common oral manifestations include burning sensation all over the oral cavity predominantly in anterior two-thirds of tongue and anterior hard palate region,^[7] pain and altered taste perception, alveolar bone loss, and recurrent allergic and microbial infections.

This article apart from giving an insight into some of the common oral symptoms of menopause, describes the fabrication of a unique metal base denture that markedly relieves the patient from such symptoms. Construction of a denture using different material, such as metal alloy

- Markedly reduces the burning on intake of cold foods and liquids as metal being good thermal conductor
- Eliminates the allergic response to denture base materials like methyl-methacrylate, thereby reducing burning as studies have attributed burning to an allergic response to methyl-methacrylate monomer^[8]
- Avoids bacterial colonization and denture-induced candidiasis associated with methyl-methacrylate denture base resins
- Results in partial or even total relief of symptoms.^[9]

COMMON ORAL CHANGES AT MENOPAUSE AND PROSTHODONTIC ASPECTS

Burning sensations

Burning mouth, also known as glossodynia, stomatodynia,

glossopyrosis, and glossalgia, represents a common oral abnormality that manifests as intense pain and spontaneous burning sensation affecting various areas of the oral cavity chiefly the anterior portion of tongue, anterior part of hard palate, gingival, and areas of denture support. Marked relief in burning sensations occurs in metal denture base wearers on having cold liquids.

Mucosal changes

The oral mucosa is in several ways akin to the vaginal mucosa.^[10] The oral mucosal changes may thus range from a condition referred to as “*menopausal gingivostomatitis*” characterized by gingiva that bleeds readily, with an abnormally pale dry/shiny erythematous appearance, to an atrophic pale appearing mucosa.^[4,10] Other oral mucosal disorders include acrylic denture-induced candidiasis, pemphigus vulgaris, lichen planus, and oral ulcerations following mechanical trauma due to abnormal oral habits and chronic methyl-methacrylate denture-induced irritation.^[3,4,10] Owing to these changes, a prosthodontist should fabricate denture as smooth as possible with a good fit. The kind of metal denture base made in the present case eliminates the acrylic denture-induced allergic reactions and avoids microbial colonization that usually occurs under acrylic denture bases.

Osteoporosis and periodontitis

The susceptibility to progressive periodontitis and osteoporosis enhances following menopause.^[11,12] The exact pathogenesis remains unclear although increased accumulation of bacterial plaque and estrogen/serum osteocalcin deficiency has been suggested as etiological factors.^[3,6,11] Systemic osteoporosis leading to generalized bone loss may make the jaws susceptible to advanced alveolar bone loss.

According to a study conducted by Kribbs, women with advanced osteoporosis were thrice more susceptible to be edentulous than healthy age-matched controls.^[12] Thus, the probability of a prosthodontist treating menopausal women would be high, making a knowledge of the oral and systemic symptoms in women of menopausal age imperative. Post-menopausal women endure greater residual ridge resorption following dental extractions than pre-menopausal women making construction of conventional dentures and placement of implants difficult.^[4] Thus, dentures should be constructed without delay after healing of ridges.

Xerostomia and Sjogren's syndrome

Dryness of mouth is frequently manifested by menopausal women.^[3] Though few studies conclude that salivary flow decreases in menopausal women with increase in salivary IgA and total proteins, others have not been able to delineate any alterations in salivary volume/composition.^[3] Sjogren's syndrome, an autoimmune disorder leading to xerostomia, keratoconjunctivitis sicca, vaginal dryness, and dyspareunia, occurs with a higher frequency in menopausal women.^[3,4,10] Management includes frequent sipping of water, artificial salivary substitutes, sugar-free gums/lozenges, xylitol tablets, and sialogogues.^[3]

CASE REPORT

A 55-year-old edentulous denture wearer female reported with the chief complaints of burning sensation in the oral cavity especially in anterior portion of mouth, frequent redness of mucosa, inability to sense temperature changes of food, and recurrent allergic and microbial infections with present acrylic dentures. Medical history revealed that the patient was undergoing treatment under a gynecologist for menopausal symptoms. Dental history revealed patient was edentulous since 2 years and had been experiencing above problems since 1 year.

So it was decided to fabricate a complete denture with a customized metal palate design that along with the ongoing treatment from gynecologist would relieve the patient from symptoms because contact sensitivity to denture base materials or to allergens and microbial antigens on the acrylic denture plate plays a greater role in burning sensation in edentulous persons.^[9]

The customized metal palate, apart from fulfilling the patient's needs, was designed in an innovative way with metal loops in specific directions and positions that would enhance interlocking with acrylic portion and also not to interfere with the teeth arrangement of artificial teeth.

Fabrication

The primary impression was made with irreversible hydrocolloid. Custom tray was fabricated and secondary impression was made with zinc oxide eugenol. The final cast derived from this impression was duplicated and refractory cast was formed. The refractory cast is used for the fabrication of the customized metal palate.

A sheet of green spacer wax was adapted on the palatal portion of the cast covering the crest of the ridge and extending 2-3 mm beyond it. Loops of 2-3 mm length made of wax were attached to the peripheral border of the previously adapted palatal spacer wax. It was taken

care that all these loops were 2-3 mm short of the sulcus as shown by straight arrow [Figure 1]. These loops would enhance the interlocking of acrylic. This was important because no loop should interfere with the acrylic border of the denture extending into the sulcus.

Tiny loops were placed slightly palatal to the crest as shown by the curved arrow [Figure 1]. The height of these loops was such that it would not interfere with the arrangement of artificial teeth but was sufficient enough for inflow of acrylic resin. A butt joint was created palatal to the crest at the junction of acrylic and metal that enhances the strength of the metal acrylic junction creates a smooth joining of acrylic with metal avoiding any step formation, thus making it comfortable for the patient.

For making the butt joint, a 2-mm cylindrical blue wax beading was adapted palatal to the crest of the ridge as shown by straight arrow [Figure 2]. A bard parker knife was run 45° to the border of the bead. Once the design of the palate in wax was done, wax sprues were attached and casting was done. The metal palate after finishing was placed now on the master cast [Figure 3] and maxillary rim was made for jaw relations [Figure 4]. The jaw relations were recorded and teeth arrangement was done. After curing, the maxillary metal denture was finished and polished [Figure 5]. The patient's pre-treatment [Figure 6] and post-treatment [Figure 7] photographs showed marked improvement in esthetics. After 3-month follow-up, patient reported drastic improvement in symptoms previously mentioned.

DISCUSSION

Menopause is associated with frequent symptoms such as burning mouth, atrophic mucosa, altered taste sensations, osteoporosis, periodontitis, and recurrent infections especially in denture wearing pre-menopausal/menopausal females. Our aim as a dentist is to provide a treatment that along with the treatment advised by gynecologists aids in providing relief.

Being able to make the patient aware of the hot and cold sensations, using a metal base instead of an acrylic base denture, markedly reduces burning sensations particularly over palatal region on intake of cold food or water. Moreover, previous studies also attribute the cause of burning mouth to an allergic response to the denture materials like methyl-methacrylate monomer. Other products used in denture fabrication have been shown to produce positive skin reactions to patch testing.^[9]

Such a metal palate design may be a boon for many



Figure 1: Straight arrow showing loops 2-3 mm short of sulcus; curved arrow showing loops placed slightly palatal to crest

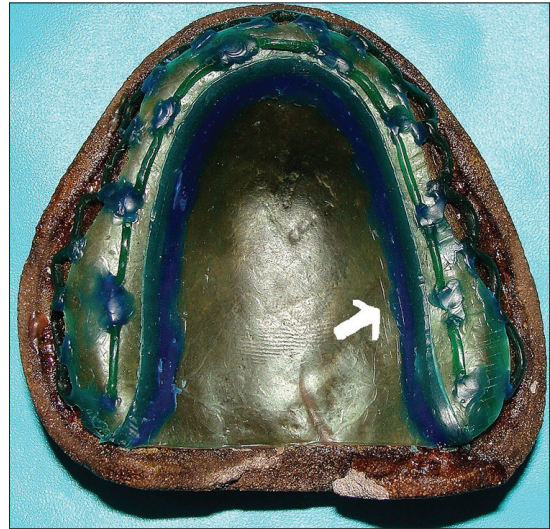


Figure 2: 2-mm cylindrical blue wax placed palatal to crest



Figure 3: Metal palate with loops placed on master cast

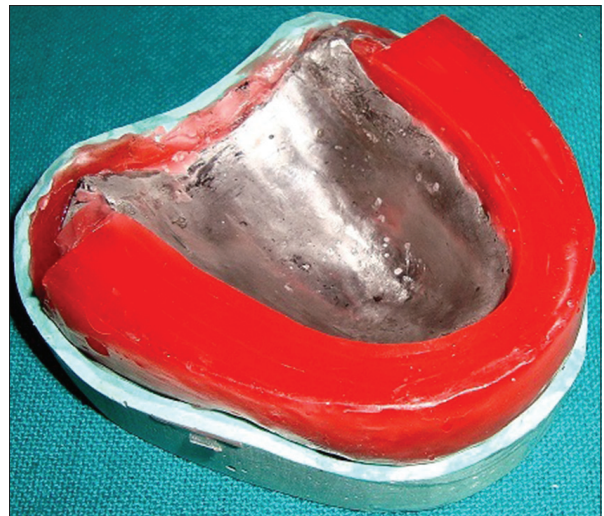


Figure 4: Finished occlusal rim with metal palate



Figure 5: Finished and polished looped metal palate acrylic denture



Figure 6: Pre-treatment photograph



Figure 7: Post-treatment photograph

completely edentulous menopausal patients as metal base also proves to be effective in decreasing the fungal growth typically present beneath acrylic base complete dentures.^[13] Studies have also demonstrated that the metal-palate dentures are perceived as being more comfortable than the acrylic resin dentures.^[14]

This case report adds an innovative metal palate design to the few previously mentioned reports on denture base designs. The looped metal design apart from markedly reducing burning sensation, allergic reactions, and eliminating microbial colonization is fracture resistant, thin, comfortable to the patient, and gives them a feeling of chewing food naturally. Such prosthesis would be a boon for a large number of menopausal women and be a small contribution from the field of prosthetic dentistry toward them, thereby providing them physical as well as psychological boost.

REFERENCES


1. Bruce D, Rymer J. Symptoms of the menopause. *Best Pract Res Clin*

- Obstet Gynaecol* 2009;23:25-32.
2. Nelson HD. Menopause. *Lancet* 2008;371:760-70.
3. Portillo GM. Oral manifestations and dental treatment in menopause. *Med Oral* 2002;7:31-5.
4. Friedlander AH. The physiology, medical management and oral implications of menopause. *J Am Dent Assoc* 2002;133:73-81.
5. Samsioe G. The menopause revisited. *Int J Gynecol Obstet* 1995;51:1-13.
6. Zachariassen RD. Oral manifestations of menopause. *Compendium* 1993;14:1586-91.
7. Ship JA, Grushka M, Lipton JA, Mott AE, Sessle BJ, Dionne RA. Burning mouth syndrome: An update. *J Am Dent Assoc* 1995;126:842-53.
8. Helton J, Storrs F. The burning mouth syndrome: Lack of a role for contact urticaria and contact dermatitis. *J Am Acad Dermatol* 1994;31:201-5.
9. Kaaber S, Thulin H, Nielsen E. Skin sensitivity to denture base materials in the burning mouth syndrome. *Contact Dermat* 1979;5:90-6.
10. Paganini-Hill A. Hormone therapy and oral health. *Menopause Manage* 2007. p. 31-40.
11. Buencamino MC, Palomo L, Thacker HL. How menopause affects oral health, and what we can do about it. *Cleve Clin J Med* 2009;76:467-75.
12. Kribbs PJ. Comparison of mandibular bone in normal and osteoporotic women. *J Prosthet Dent* 1990;63:218-22.
13. Perezous LF, Stevenson GC, Flaitz CM, Goldschmidt ME, Engelmeier RL, Nichols CM. The effect of complete dentures with a metal palate on candida species growth in HIV-infected patients. *J Prosthodont* 2006;15:306-15.
14. Hummel SK, Marker VA, Buschang P, DeVengencie J. A pilot study to evaluate different palate materials for maxillary complete dentures with xerostomic patients. *J Prosthodont* 1999;8:10-7.

How to cite this article: Bhatia V, Bhatia G, Jain N, Jadon AK. An innovative metal base denture design for a 55-year-old menopausal woman. *J Nat Sc Biol Med* 2013;4:468-72.

Source of Support: Nil. **Conflict of Interest:** None declared.

Access this article online

Quick Response Code:	Website: www.jnsbm.org
	DOI: 10.4103/0976-9668.116976