Effective Patient Dentist Communication : Key to Successful Complete Denture Treatment

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ABSTRACT

Good Communication has a powerful therapeutic effect in all forms of treatment the dentist renders. Special emphasis needs to be given when treating Complete Denture patients. The present article will review why and how communication skills can improve prognosis of a complete denture.

INTRODUCTION

Devan's statement, "The dentist should meet the mind of the patient before he meets the mouth of the patient"[1], emphasizes the need for careful assessment of the patient's problems to reach a correct diagnosis. Psychological evaluation, careful examination, accurate diagnosis and clinical expertise can treat most of the problems in Complete Denture Prosthodontics. The first need in assessment is good communication and understanding of the patient's behaviour, which greatly influences the success.

As students, training we receive is mostly directed towards acquisition of clinical and technical skill based on the background of physical, biological and material sciences. Natural sciences, have always been emphasized at the expense of behavioral sciences[2]. Therefore there is a need to lay greater emphasis in developing our communication skills, as we know that the best results and good patient relationship can be achieved only when treating co-operative and informed patients.

NEED FOR COMMUNICATION : ITS RELEVANCE IN COMPLETE DENTURE PROSTHODONTICS

Losing one's teeth and having Complete Dentures is a stressful event. For patient's unfortunate to lose their teeth the importance of comfortable, efficient, complete dentures cannot be overemphaszed. Unlike other disciplines, where treatment and success is clear-cut, success in Complete Denture Prosthodontics is best defined as partial or relative, depending on the existing oral condition and patient's adaptability and expectancy. A patient's initial certainty that treatment will be successful, can end in disappointment unless their expectations are tempered by education through adequate communication.

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APPLICABILITY OF COMMUNICATION IN COMPLETE DENTURE PROSTHODONTICS

Having stressed on the importance of Communication skills its applicability in Complete Denture Prosthodontics may be considered under three headings:

1) For a patient wearing the denture for the first time.
2) For an unsatisfied Denture wearer.
3) For a satisfied Denture Wearer whose dentures need replacement.

I. FOR A NEW DENTURE WEARER

The expectations of a new denture wearer have to be tempered down to the realities of denture wear.

Prior to treatment, it is imperative to inform all new denture wearers that efficiency of dentures can never equal that of natural teeth. Routine problems associated with new dentures and their solutions must be elaborated. Regular maintenance and periodic replacement of non-serviceable dentures must be stressed upon. Majority of the educated new denture wearer would then attend with a specific identifiable fault, which may be pain, looseness, functional problems or appearance. Most of these problems can be corrected to ensure patient satisfaction if the personal details are adequately reviewed and patient sufficiently informed.

II. FOR AN UNSATISFIED DENTURE WEARER

The importance of adequate patient communication cannot be overemphasized while treating an unsatisfied denture wearer. It is good practice to believe that most of the problems faced by these patient's are real and not psychosomatic, but all too often these problems may not be of dental origin, but may be associated with a period of crisis in their life or an unwillingness to face the realities of denture wear without understanding its limitation. Treatment is frustrating unless this is recognised. The patient needs to be reassured that everything possible for his well being is being done, and referral for psychotherapy may be the only recourse[2].

III. FOR A SATISFIED DENTURE WEARER WHOSE DENTURE NEEDS REPLACEMENT

Another patient who needs careful assessment is the one who has worn his present dentures for some years

and although they are still functional, feels his dentures are old enough to require replacement. The clinical situation may also warrant change in dentures, as assessed by the change in the topography of alveolar ridges bearing no resemblance to the tissue bearing surfaces of the denture, severe wear of the prosthetic teeth, contributing to the reduced vertical dimension of occlusion, redundant, inflamed alveolar mucosa demonstrating body's reaction to ill-fitting and poorly maintained dentures. When the clinical situation warrants change in dentures, it often necessitates redesigning of the patients existing dentures including modification in the patient's vertical dimension, centric occlusion and aesthetic features. Patients must unlearn habits that they developed to overcome deficiencies in their old dentures while simultaneously acquiring skills to use their new dentures[3]. Such dramatic adjustments physically, functionally and emotionally would be a challenge for any patient regardless of the age[3]. Only an adequately informed patient is capable of appreciating the transitional nature of the new dentures, the need for periodic checkups enabling them to preserve the integrity of the new dentures.

In the other category, where the dentures are still functional, but the patient feels that the dentures are old enough to require replacement communication skills are also important. Although the patient may not complain if little or no improvement is made in the new dentures, they will help as "Practise-builders", by wholeheartedly advocating us in future, if after discussion, minor improvements can be made at moderate expense by reline or addition[2].

BENEFITS OF EFFECTIVE COMMUNICATION

The benefit of effective communication needs to be emphasized.

According to a study conducted by Collet [1982], over a five year period 25% patients are lost due to poor dentist - patient communication.

When communication is good patients communicate better and faster with instructions, display greater confidence in the dentist's skills. Information provided by such a patient promotes better understanding of the patient's problems enabling the dentist to solve the problem with ease. Patients who walk out satisfied will benefit the dentist in the long run, though there was time spent initially in educating the patient. Better results are thus achieved when treating an informed and cooperative patient. However, it must be remembered that good communication skills is no substitute for poor clinical work, and in such a situation the dentist is morally responsible to refer the case to the appropriate competent clinical hands.

METHODS TO IMPROVE PATIENT - DENTIST COMMUNICATION

1. The greatest obstacle to effective communication is on the dentist's side. The dentist must temper down his dominating attitude, attempt to control the situation and to save clinical time[2]. It is good to remember that though clinical time is at a premium, patient time is also valuable. Our interest in our profession, professional abilities, and patient will make acquisition of this habit easier[2].
2. Having understood this, seat the patient at ease and sitting opposite attempt to overcome by word and manner impediments to free communication.
3. Use simple language. No patient likes to admit to ignorance, but unwillingness to ask the meaning of a word might prevent important details being provided, and thus prevent compliance[2].
4. Speak slowly, clearly and lucidly. Special problems are encountered when treating elderly complete denture patients. Deafness is one common ailment. The dentist must therefore speak slowly for maximum comprehension. At the same time avoid giving a childish, oversimplistic explanation which might create a negative attitude and act as a communication barrier[2].
5. Lastly, it must be remembered that communication is an ongoing process. It is through this process that education is imparted to the patient from the first appointment and continues thoughout the treatment schedule. Even following treatment, the flow of information must continue verbally and reinforced by written instructions.
6. Finally, it is good to interpret the patient's dental problems not as their own but rather the problems we dentists are going to face, with the advantage that patient willingness and good intention will help us to solve the problem.

CONCLUSION

Good Communication has a powerful therapeutic effect in all forms of treatment we dentist render. Special emphasis to this aspect of behavioral science in the field of Complete Denture Prosthodontics as compared to other branches of Prosthodontics needs to be given primarily for two reasons.

1. Difference in nature of support the prosthesis derives.
2. Psychological and emotional adaptations these elderly patients undergo.

Although good communication skills need to be stressed, they are in no way a substitute for poor

clinical work. In such a situation, the dentist has a moral obligation to refer the case to the appropriate competent hands. Good communication coupled up with good clinical skills can lead to better treatment and satisfaction for both the dentist and the patient making our professional work truly pleasurable.

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Abstract

COMPUTER BASED EVALUATION OF GENDER IDENTIFICATION AND MORPHOLOGIC CLASSIFICATION OF TOOTH, FACE AND ARCH FORMS

This study evaluated whether anterior tooth form reflected gender and questioned if there was a correlation among face, arch and tooth forms based on prosthodontics opinions. Digital photographs of full face, dental arch and anterior teeth images of 60 dental students were made. Thirteen prosthodontists (minimum 10 years of experience) evaluated the images to identify the gender of the subjects by observing the images of anterior teeth. In the second session, they were asked to classify the forms of face, dental arch and tooth correlations among face, arch and tooth forms were also evaluated. Intra and inter observes agreement were evaluated using the kappa statistic.

The mean correct identifications in females and males were 53% and 58% respectively the ratio of male and female subjects who were identified correctly and completely the same in both evaluations were 41% and 36% respectively. The prosthodontists observed that face to arch form and face to tooth form correlations (54% and 51% respectively) were higher than the tooth to arch form correlation. The prosthodontists were in fair agreement on tooth form dentition.

The results of this study indicated that the prosthodontists were unsuccessful in distinguishing gender by visual evaluation of anterior teeth. There were also significant inter and intra observer differences in classifying face, arch and especially tooth forms. This study confirmed that sex-related differences in tooth forms are arbitrary and could be biased.

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A Clinical Evaluation of Speech between A Fixed and A Meatal Type of Obturators

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Pharyngeal obturator prosthesis can be used for speech objectives in patients with congenital and acquired soft palate defects. Most pharyngeal obturators are used to separate the nasopharynx and oropharynx during speech and deglutition. The prosthesis consists of a partial or complete denture base unit & pharyngeal extension that will not only physically modify the pharyngeal airway but also provide an object against which the surrounding structures can function to provide a seal between oropharynx and nasopharynx. A patient in this study had an acquired hard and soft palate defect due to surgical removal of a nasopharyngeal tumor. His chief complaint was phonation & to attain a close to normal speech after surgery. He was treated with both horizontal and meatus type speech bulb Obturators. The speech was evaluated after the patient wore each prosthesis individually for a period of ten days. The results indicated that the fixed (Horizontal) obturator was more effective in refinement of speech than the meatus, which can be advantageous only for improved prosthesis retention and stability.

INTRODUCTION

Speech is a learning process and develops over an extended period. Most master the normal articulation of speech by 6 years of age, whereas some require an additional year of maturation for speech. Speech is easily disturbed by ablative surgery and congenital malformations. A cleft palate by definition is a congenital tissue or] elongated opening in the soft and /or hard palate. It may be congenital or acquired. The basic disability of the cleft palate is that the individual is unable to close the nasopharynx from the oropharynx. In the normal individuals this closure is effected by the complete hard palate and by the raising of the soft palate into intimate contact with the posterior and lateral pharyngeal walls. This airtight separation of the two cavities is essential for the functions of swallowing and speech[1].

Key Words : Cleft Palate, Horizontal type obturator, Metal type Obturator, Articulation, Resonation, Hypernasality, Hyponasality, Speech unintelligibility, Nasal Emission, Compensatory Error Patterns.

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CLASSIFICATION OF CLEFT PALATES [VEAUS 1931][2]:

Class I - Clefts involving soft palate only.
Class II - Clefts involving soft and hard palates but not the alveolus.
Class III - Clefts involving the soft and hard palates and continuing through the alveolus on one side of the premaxillary area.
Class IV - Clefts involving soft and hard palates and continuing through the alveolus on both side leaving a free premaxilla.

TYPES OF OBTURATORS :

1. Hinged Obturator Or Artificial Velum :-

It was first reported by Delabarre and Snell in the early 1820's. Modifications by Stearn and Kingsley and later by Baker made the hinged obturator the prosthesis of choice in the later half of the 19th century.

This obturator relies on the activity of the superior pharyngeal constrictor muscles and the residual soft palate muscles to move the obturator into position during function. The success of this obturator requires residual soft palate muscle activity as well as a stable retentive prosthesis base to support the additional weight of the hinge and the mobile obturator section. In addition, the size at rest to the size in function is likely to be different because of the change in shape of the nasopharynx resulting in an inefficient palatopharyngeal closure[3].

2. FIXED OR HORIZONTAL OBTURATOR :-

In 1868 Suersen first published and Fitzgibbon reported on its usefulness in the 1920's.

The obturator is placed in a fixed position within the pharynx at the site of maximum muscle activity or approximately at the level of the palatal plane.

During physiologic function, the obturator is contacted by the posterior pharyngeal wall and the lateral pharyngeal musculature, creating a separation between the oropharynx and the nasopharynx[3].

3. MEATUS OBTURATOR :-

In 1946 it was first described by Sehalit.

It provides a static obturation and is not dependent on the surrounding muscle activity to provide a more physiologic seperation between the oral and nasal structures[3].

AIM AND OBJECTIVE :-

To evaluate the effectiveness in refinement of speech for a patient wearing a meatus or a horizontal pharyngeal obturator.

CASE HISTORY :-

A 32 year old male patient residing at Chengelpattu, Tamilnadu reported to the department of prosthetics at Sri Ramachandra Dental College with the chief complaint of difficulty in speech (fig.1).

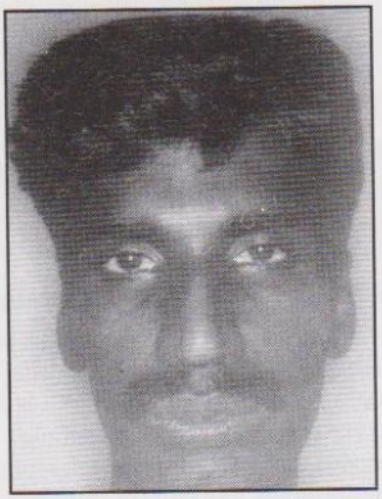

Fig. 1 : Case Report: Patient with a nasopharyngeal carcinoma. (Extra-Oral view)

HISTORY & EXAMINATION:

Relevant history revealed that the patient had nasopharyngeal carcinoma 5 years before and has been surgically treated 2years prior to this visit and his only need was to attain a more normal speech (fig.2). Intra-oral examination revealed class II cleft palate with a class II molar relationship.

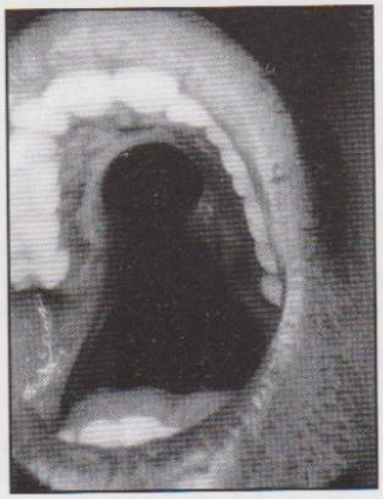

Fig. 2 : Pretreatment photograph showing class-II cleft palate after surgery. (Intraoral-view)

PROSTHETIC REHABILITATION :

Since phonation was the priority, the treatment plan was to construct both meatus and the fixed speech obturators and to clinically evaluate which type could produce a better quality of speech.

FABRICATION OF A MEATUS SPEECH BULB[3]: -

Preliminary impression was taken in two pieces with putty and impression compound (fig.3). A Special tray was constructed and an 18-gauge wire loop was added to the posterior border of the tray with autopolymerizing acrylic resin. The loop was extended horizontally without contacting the remnants of the soft palate and then extended vertically into the area of the posterior nasal orifice. A primary modeling compound impression was made by adapting the softened low-fusing impression compound to the supporting loop.

Fig. 3 : Preliminary impression in two pieces. (putty& impression compound)

The primary compound impression was then border moulded using additional low-fusing compound and border seal would be evident when the posterior choanae are obturated as noted by positive tissue contact and the patient's inability to inhale or exhale through the nose.

The Anatomic Land marks recognized in the impression are two lobes denoting the right and left nasal cavities project anteriorly divided by a groove caused by the posterior margin of the vomer bone. The lateral depressions are caused by the inferior turbinates. Posterior to the turbinates outlines of the orifices of the Eustachian tubes are evident. Finally a wash impression is taken after the mouth preparation (fig.4). The Mouth Preparation was planned to accommodate six embrasure clasps. The cast was made after which the meatus obturator was processed and two vent holes were placed at the superior third of the anterior surface and angled downward at a 45-degree to the posterior surface (fig.5). The vents are

enlarged gradually until breathing through the nose is comfortable (fig.6).

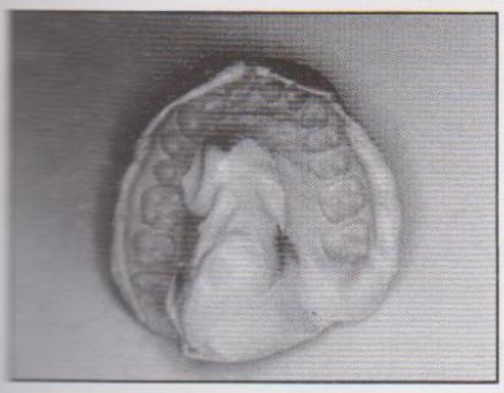

Fig. 4 : Master impression.

Fig. 5 : Meatus obturator with six embrassure clasps.

Fig. 6 : Meatus obturator showing vent holes (arrow).

FABRICATION OF HORIZONTAL SPEECH BULB[2] :-

At first a piece of a palatal plate is constructed with six embrassure clasps in the master cast prepared for meatus obturator and a 'U' shaped wire loop is attached to the first piece (fig.7 & 8). The horizontal plane location of the obturator was made with impression compound :

- By asking the patient to tilt the head so that his chin rests on his chest.
- By asking the patient to swallow so that the inferior border of the obturator is in contact with the tongue during swallowing and simulating normal physiologic movements.

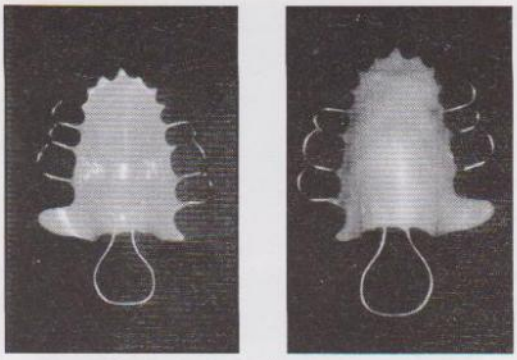

Fig. 7, 8 : First piece of horizontal obturator.

- By tilting or flexing the neck side-to-side and then swallowing (fig.9).

Fig. 9 : Horizontal plane location.

Then the second piece was beaded and boxed (fig.10). Master cast made and second piece processed with self-cure resin attached to the first piece (fig.11, 12, & 13).

Fig. 10 : Beading & boxing of the second piece.

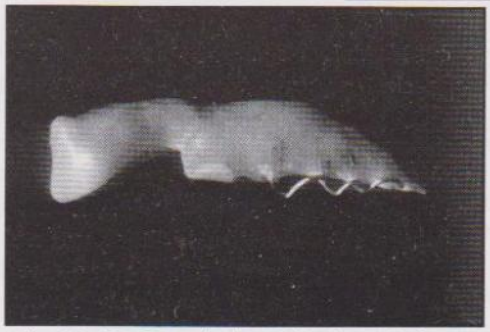

Fig. 11, 12 : Second piece of horizontal obturator processed.

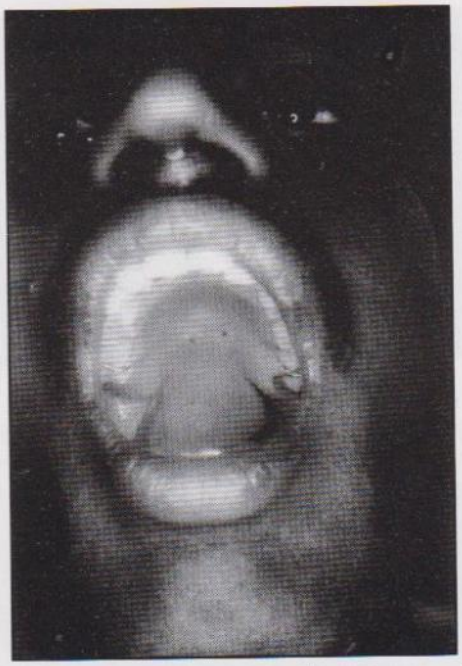

Fig. 13 : Horizontal obturator in the patients mouth.

MATERIALS & METHODS :

Speech Evaluation :-

The patient was asked to wear both the obturators separately for more than ten days before his speech were evaluated. Three judges who are qualified speech pathologists perceptually analyzed the subject's speech and the speech recording was done in an audiocassette using a unidirectional microphone held at 5cm from the subject's mouth and the recording process was carried out in a sound-treated room to enhance the quality of recording.

The speech recording was done on the following conditions: -

- Before the insertion of the obturators.
- After the insertion of the meatus type obturator.
- After the insertion of the horizontal type obturator.

The spontaneous speech of the subject, Pittsburg sentences like 'mama made lemon jam', the ship goes on shallow water' and a standard tamil articulation test was recorded to analyze the art and resonance of the subjects speech. The judges were instructed to rate the

- Articulation : Mild / Moderate/Severe
- Resonation:
  Hypernasality: Mild/Moderate/Severe
- Speech intelligibility: Intelligible/Occasional/ Listener's attention needed.
- Nasal emission: Mild/moderate/ severe.
- Compensatory error pattern: Present/Absent.

RESULTS :

The analysis of the results of 3 judges revealed the following :

Comparision of Speech Patterns

Parameters	Before Wearing An Obturator	Meatus Type	Fixed / Horizontal
Articulation	Severe distortion errors	Severe distortion errors	Mild distortion error
Hyper Nasality Hypo Nasality	Moderate Nasality Absent	No Nasality Present	Mild Nasality Absent
Speech Intelligibility	Occasional repetition of words	Listeners attention needed	Intelligible
Nasal Emmision	Mild	Mild emission	No emission
Compensatory Error Patterns	Absent	Absent	Absent

There are 4 components of speech, namely

- Resonation
- Articulation
- Respiration
- Phonation

Of the four components the resonation and articulation are only components influenced by maxillofacial prosthodontic rehabilitation1.

RESONATION :-

The sounds produced at the level of vocal folds are augmented and modified by the chambers and structures above the level of the glottis. The pharynx, the oral cavity and nasal cavity act as resonating chambers by amplifying some frequencies and muting others thus refining tonal quality. The velopharyngeal mechanism propotions the sound and /or air stream between the oral and nasal cavities and influences voice quality that is perceived by the listener[1].

Resonance disturbances manifests as

- Excessive nasal resonance (hypernasality)
- Inefficient nasal resonance (hyponasality)

ARTICULATION :-

Amplified resonated sound is formulated into a meaningful speech by articulators namely the lips, tongue, cheeks and palate. The tongue is considered to be the single most important articulator of speech, which may impede, selectively restrict and channel the air stream with precise contact against the teeth and palatal areas[1].

ERRORS IN ARTICULATION :-

- Distortion: A sound distorted from normal production.
- Substitution: One sound is substituted for other in a word. Eg: (k) for (t) cap for tap
- Omission: completely omitting a sound in a word. Eg: 'sool' for 'school'.

DISCUSSION :

The Fixed pharyngeal obturator is the most common type of pharyngeal obturator in use today and is the most effective in refinement of speech for many patients. It provides a more physiologic separation between the oral and nasal structures and is located in a region of muscle activity; therefore speech therapy is effective in refinement of speech.

It has reduced retention and stability in edentulous patients because it creates a long lever arm that encourages dislodgement of the denture base. The Meatus type obturator improves retention and stability of a prosthesis if used in edentulous patients but it's not effective in refinement of speech like fixed obturator. It may be difficult to obtain a vent size that permits good speech, without interfering with nasal respiration. It's contraindicated for use in patient's whose soft palate defect is narrower than the nasopharynx in the region of the posterior choanae & when the path of insertion of any prosthesis is different from the vertical path of insertion. It also interferes with the normal physiologic flow of mucous posteriorly from the nose to pharynx & causes irritation and trauma since it is in constant contact with the sensitive nasal mucosa.

CONCLUSION :-

Within the limitations of the study, it is evident that the fixed pharyngeal obturator was more effective in refinement of speech and comfort for the patient than the meatus type obturator because it does not provide a physiologic seperation between the oral and nasal structures and is not dependent on the surrounding muscle activity. However the need for improved retention and stability of a prosthesis for use in edentulous patients may suggest the use of meatus type obturator in some patients.

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Abstract

CYTOTOXICITY OF DENTAL CASTING ALLOYS AFTER CONDITIONING IN DISTILLED WATER

Purpose : This study investigated the cytotoxicity of various types of dental casting allows after they had been conditioned in distilled water.

Materials & Methods : The casting alloy investigated included one high-noble alloy Bioherador N six base metal alloys, including four. Ni-Cr alloys (Remanium Cs, Heranium Na, Wiron 99, CB Soft), one co-cr alloy (Wirobond C) & one CU based alloy (Thermobond). Ten disks from each alloy were conditioned in distilled water at 37°C for either 72 or 168 hours. The cytotoxicity of the alloys was ten tested on balb/c373 fibroblasts, which were exposed to the alloys for 3 days at 37°C cell viability was determined by the MTT method. The data were analyzed by Anova & Follow-up comparison between the groups was carried out using turkey & tests.

Results : Anova revealed a significant effect of alloy type & conditioning time ($P<0.007$). Bisherador N was significantly less toxic than all the other alloys in the 72-hour conditioned group. After 168 hours of conditioning, its cytotoxicity was not different ($P>0.05$) from that of Remanium CS, Wiron 99 & Wirobond C. Thermobond & CB Soft were significantly more toxic than the other alloys at both conditioning times.

Conclusion : Conditioning of base-metal alloys, other than those containing CU for 168 hours in distilled water makes their cytotoxicity levels comparable to that of high noble alloy.

- Ahmad S. Al-Hiyasal, Homa Darmani, Omar M. Bashabsheh
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Rehabilitation of an Ophthalmic Socket by an Ocular Prosthesis

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ABSTRACT

When an anophthalmic socket is restored with an ocular prosthesis it should help the patient to cope better with the difficult process of rehabilitation after an enucleation or evisceration. Prosthesis for orbital defects can be made to be quite natural in appearance. Margins can be hidden in natural skin folds or behind the eyeglass rims. Additionally the use of tinted lenses can mask the slight color and differences in light reflection between the patient's skin and the prosthesis.

INTRODUCTION

When trauma or disease causes a loss of an eye, the combined efforts of the ophthalmologist and the maxillofacial prosthodontist are needed to provide a satisfactory ocular prosthesis.

ROLE OF PROSTHODONTIST IN REHABILITATION

The different surgical procedures resulting in the loss of eye are evisceration, enucleation and exenteration[1]. Evisceration is the removal of the contents of the globe, leaving the sclera (and at times the cornea) intact. Enucleation is the removal of the entire eyeball after severing the muscles and optic nerve. Exenteration, the most radical, is the removal of the entire contents of the orbit.

Since every socket differs in size and shape, it is obvious that an individually designed prosthesis made from an impression of the socket is needed to offer maximum comfort to the patient. The placement of an ocular implant can also be considered which will provide additional anatomic support for the residual contents of the orbit, increases the mobility of the overlying ocular prosthesis and provides muscular stimulus for orbital growth in a growing child in particular[3-5].

When the orbital defect is combined with a large facial defect, there will be severe facial disfigurement which will put the patient in a state of anxiety, shame, self consciousness, inferiority and social inadequacy.[2] Maxillofacial reconstruction of the large defect can definitely offer a reduction of such feelings for the patient. Successful esthetic results of the prosthetic reconstruction are determined primarily by the nature of the defect, the skill of the prosthodontist and the properties of the materials used.

The most complicated defect is that resulting from an orbital exenteration for which the surgeon can do much to aid in the prosthetic rehabilitation[6]. The surgeon can create a firm inferior margin which will not sag later due to the weight of the restoration. The site for the orbital prosthesis can be improved by contouring the superior and lateral walls of the bony orbital rim to allow good skin coverage of these structures. This will facilitate the healing process and allow adequate space to position the prosthetic eye superiorly and posteriorly.

Presently three types of acrylic resin prosthesis are used. Stock eyes, stock eyes modified by various methods[7] and custom fitted eyes made from an impression of the socket.

Some success can be obtained with a stock prosthesis because the mucosa can be easily displaced. But the patient will experience some type of discomfort, and the mucosal surface will not fit snuggly enough to utilize the full potential to produce movement. Also potentially irritating mucus and debris can get collected in the voids[8].

An acrylic resin ocular prosthesis may be modified by using an appropriate dental impression material and get it adapted closely to the anophthalmic socket. But the limitation of the currently used dental impression materials is that the set material is not well tolerated when kept in prolonged contact with the intraocular soft tissues.[9] A viscoelastic tissue conditioner material as an impression material to modify a stock ocular prosthesis can also be used.[10]

The indication for a custom made ocular prosthesis includes a post surgical socket with a suitable tissue bed, the socket exhibiting a healthy and intact conjunctival epithelium, deep fornices and taut eyelids. The custom made ocular prosthesis may be contraindicated when an undue change in socket volume has taken place. A loss of socket volume may arise from conditions such as anophtalmos, microphthalmos, or tissue shrinkage due to noncompliance by the use of an ocular prosthesis by a growing child. Socket expansion, which uses prosthetic devices of progressively larger sizes over an extended period has demonstrated promising results in this situation.[11]

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An excessive increase in socket volume may arise as a postenucleation sequelae. These involve several characteristic features such as the presence of a deep superior fornix, superior lid ptosis, sagging of the inferior lid, and lateral canthus. Other features include posterior and inferior migration of an existing ocular prosthesis, loss of attachment, and migration of the ocular implant Surgical correction is needed to reduce excessive socket volume in these circumstances.[15]

FABRICATION OF A CUSTOM FITTED OCULAR PROSTHESIS

In the first appointment obtain a history of the missing eye. If the loss was caused by a pathologic condition, be alert for the evidence of recurrence. Examine the socket and note the palpebral tonicity. If scar tissue restricts normal pliability or frankly distorts the lids and surrounding tissues, the palpebral opening will not correspond to that of the normal eye. Eye loss in early childhood hinders normal growth processes and radiation treatment further retards development. Make the child's prosthesis as large as possible to stimulate normal development. The socket is fully developed at about 12 years of age.

SELECT A SUITABLE STOCK ACRYLIC RESIN OCULAR PROSTHESIS

The dimensions and color of the iris-pupil complex and the sclera should be closely similar to that of the contralateral eye. Match the size, shape and outline of the ocular prosthesis appropriately to the socket dimensions. Modify the stock ocular prosthesis by trimming its periphery to fit the eye socket. Always protect the central iris-pupil-corneal area when adjustments are made to the ocular prosthesis.

Take an impression of the stock acrylic prosthesis and make a special tray in cold cure acrylic for taking the impression of the socket. Make a hole in the middle portion of the special tray and fix a small plastic tube of 2 cm length and 4 mm diameter. Place the special tray in the socket and inject light body impression material through the tube into the socket. After the material is set, take out the impression. Trim the excess impression. Box the impression and pour stone plaster. Make small index on the stone plaster. After setting, the tube fixed to the special tray is removed, petroleum jelly applied on the outer surface and stone is poured over the outer surface of the special tray. After setting, the two halves are separated and the special tray and the impression are removed. The special tray is replaced by the stock eye shell. Free flowing molten modelling wax is poured on the other half and the two halves are kept closed for 30 minute. After the wax is set, the waxed eye shell is taken out and tried it on the patient's eye socket. Its position should match with the gaze of the normal eye when the patient is staring directly at a point at eye level at least 2 feet away when the patient is sitting upright. If a bright penlight is held at eye level and the patient looks directly at the light, a reflection of the light is visible in the centre of the pupil of the natural eye. The replaced eye should be positioned to provide the same reflection.

After try in of the prosthesis the patient is allowed to use it for 24-48 hours. After 48 hours review the orientation, comfort, hygiene and tissue health with the modified prosthesis. When the esthetics and adaptation are satisfactory, send the ocular prosthesis for laboratory conversion of the modelling wax into acrylic resin, preferably heat cure to complete the custom made prosthesis.

CONCLUSION

The method described affords convenient clinical control and evaluation during prosthetic modification of the stock ocular prosthesis. Careful preparation of the patient for acceptance of the prosthesis may be necessary to prevent psychologic problems and rejection of the prosthesis.

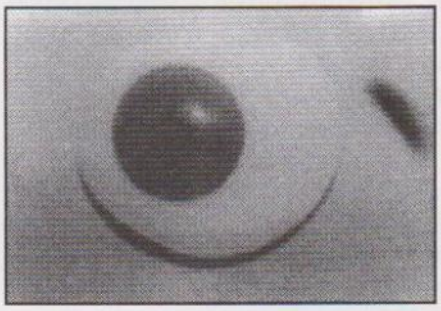

Fig. 1 : Stock acrylic resin eye prosthesis.

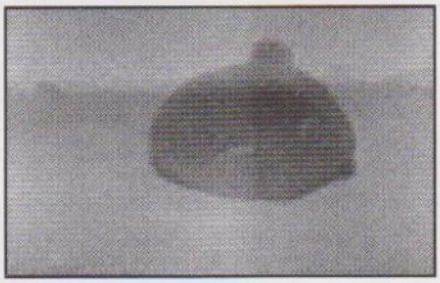

Fig. 2 : Special tray

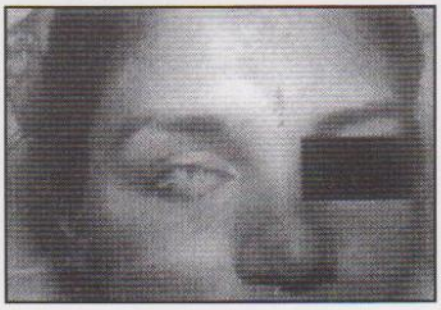

Fig. 3 : Special tray inside the socket.

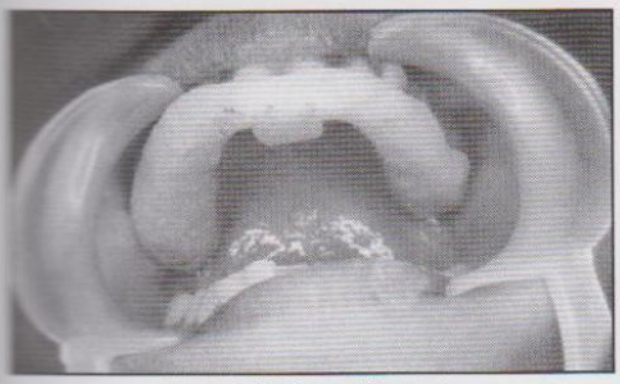

Fig. 1 : Splint in maxillary arch.

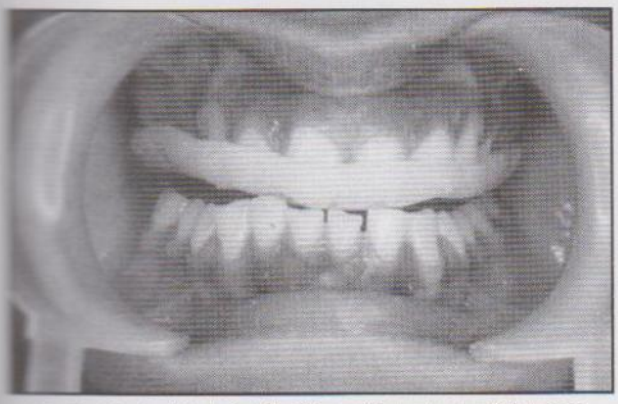

Fig. 2 : Marked Anterior Position with posterior Disclusion.

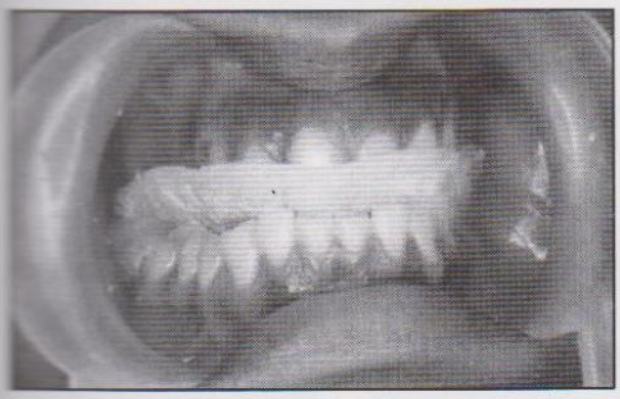

Fig. 3 : Posterior disclusion space closed with self Polymerizing acrylic resin.

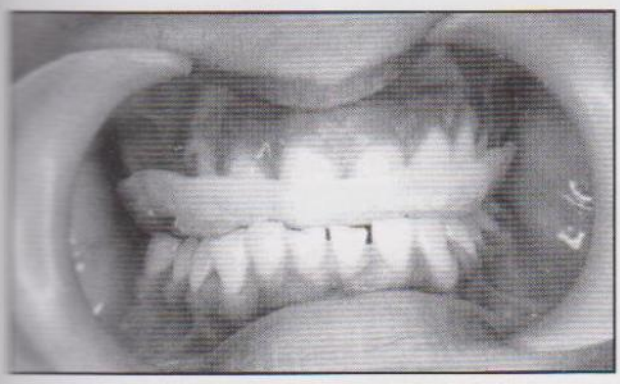

Fig. 4 : Uniform contact over the lower teeth.

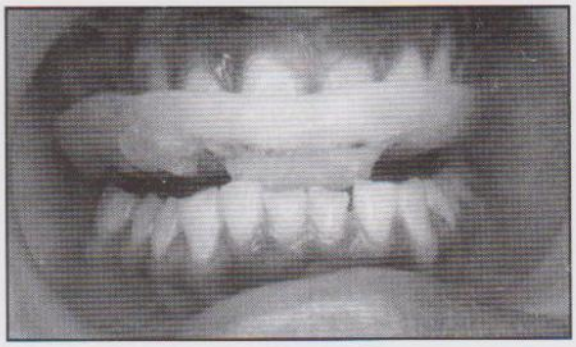

Fig. 5 : Anterior ramp to guide the mandible to repositioned place.

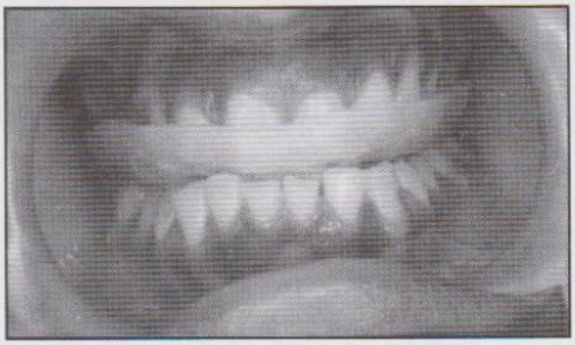

Fig. 6 : Completed Appliance and Anterior position of the mandible.

anywhere between 1,500 and 20,000 cycles/second [hertz(HZ)]. By definition, ultrasound uses vibratory frequencies in the range of 1 to 20MHZ.

As the ultrasonic beam passes through or interacts with tissues of different acoustic impedance it is attenuated by a combination of absorption, reflection, refraction and diffusion. Sonic waves that are reflected back (echoed) produces an electrical signal that is amplified, processed and ultimately displayed on a monitor. The fraction of the beam that is reflected back to the transducer depends on the acoustic impedence of the tissue, which is a product of its density and the beam's angle of incidence. By this changes in echo patterns, they delineate different tissues[3].

High - resolution B-mode sonography has improved in the past few years and has become a very valuable tool in the diagnosis of head and neck[4]. It provides valuable diagnostic information with a high degree of diagnostic accuracy[5,6].

INTERPRETATION OF ULTRASOUND :

Emshoff et al[5] used dynamic imaging for the full range of motion in the mandibular opening this was used to evaluate the presence or absence of disk displacement at closed mouth and maximal open-mouth positions.

With the patient in a supine position, the transducer was placed over the TMJ, parallel to the long axis of mandible ramus. The transducer was tilted

until the optimal visualization was obtained. On the sonograms, the disc is visualized as a thin homogenous, hypo to-isoechoic band lying adjacent to its inferior relation (overlying the mandibular condyle). The bony landmarks of the mandibular condyle and the articular eminence are visualized as hyperdense lines. The course of disk's motion was identified by having the patient slightly move the mandible. During dynamic evaluation, the sonographic beam must be kept in exactly the same orientation to the diskal surface to avoid artifactual changes in diskal echogenicity.

In evaluating findings of the closed mouth, the position of the disk is considered to be normal, if the intermediate zone of the disk was located between the anterosuperior aspect of the condyle and the posteroinferior aspect of the articular eminence. Disks with the intermediate zone located anterior to this position was considered displaced. In evaluating findings of the open mouth, the position of the disk was considered normal if the intermediate zone of the disk was located between the condyle and the articular eninence of the condyle.

The accuracy of prospective interpretation of high resolution sonograms of internal derangement, disk displacement with reduction and disk displacement without production was 95%, 92% and 90% respectively[5].

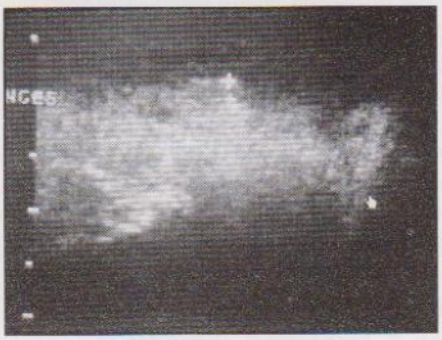

Fig. 7 : Ultrasound with Appliance.

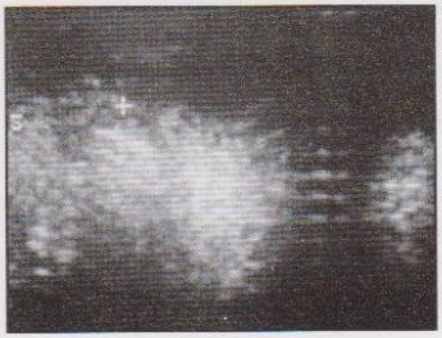

Fig. 8 : Ultrasound without Appliance.

In this case ultrasound was used to diagnose the condition based on the study by Rudiger Emshof et al. The ultrasound was also used with (Fig-7) and without occusal appliance (Fig-8) and the space was found to increase between articular eminence and condyle which shows one of the Primary purpose of occlusal appliance.

Patient was informed about the cause and prognosis of osteoarthritis. As the load in the TMJ was reduced the disease will become self limiting. Patient was instructed to wear APA and felt comfortable after a week and month of review.

Studies has shown that prolonged use of APA will cause posterior openbite and occlusal problems. So the patient should be followed closely for the effect and affect of the appliance therapy.

Because of its simplicity in treating the TMD's, the appliance therapy is not always indicated rather than treating, sometimes it will harm the existing situation due to its improper use. So selection and use of appliance must be based on accurate diagnosis and understanding of the disorder, which will go a long way in managing scores of patients with TMD's.

CONCLUSION :

Dynamic ultrasonography is an inexpensive and noninvasive diagnostic technique with relatively high specificity that could be used to supplement clinical evaluation in patients with TMJ disorders. It may help in the identification of normal disk position in subjects presenting with signs and symptoms of TMJ internal derangements. With additional interest and research in the potential uses and diagnostic capabilities of dynamic ultrasound, it may gain importance as a diagnostic aid in patients with TMD's.

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Cytotoxicity of Monomer Leached from Acrylic Resins (Indian Brands) - An in Vitro Study

Jain Reeta, M.D.S.*, Garhia Shobha, M.D.S.*, Seth P. K., Ph.D.**

ABSTRACT

This study examined the Cytotoxicity of monomer leached from acrylic resins of six different concentrations i.e. from 3.5 X 10-3 V/V % to 0.021 X 10-3 V/V % 900µl of cell suspension and 100µl of methylmethacrylate of various concentrations were added to a 24 well flat bottom cell culture plate with culture area of 2 cm² and incubated in 90% humidified atmosphere of 5% Co2 in air at 37° C ± 2° C for 2,3 and 5 days. Cytotoxicity was evaluated by determiniing the relative ratios of cell numbers to control values. It was observed that relative ratio (%) of cell numebrs to control was maximum in group VI (0.021 X 10-3) V/V %) on 2nd day (95%) and minimum in group I (3.5 X 10-3 V/V %) on 3rd day (36%).

INTRODUCTION

Data on biologic actions of monomeric and polymeric methylmethacrylate indicate that localized toxicity is caused primarily by the methylmethacrylate (MMA) released from denture base polymers and bone cements. Adverse effects caused by chemotoxic activity of dental polymers has been investigated by cell culture techniques in-vitro, animal studies in-vivo and by clinical observations on patients treated with removable dentures and fixed partial dentures.[1]

It has been shown that the potentially toxic substances that eluate from traditional denture base resins include formaladehyde, methylemethacrylate, methacrylic acid and benzoic acid.[2] The cytotoxicity of resins was postulated to be related to reaction by products or to unreacted components released from the materials.

This in vitro study examined the cytotoxicity of methylemethacrylate leached from four Indian brands of heat and auto polymerized resins by cell culture method.

METERIALS & METHOD

The equipments used for cytotoxicity were filter assembly, "millipore syringe filter, pipette aid, hemocytometer, CO2 incubator, microscopes (Inverted phase - contrast microscope and simple microscope), laminar flow hood, 24 well flat bottom cell culture plate, refrigerated centrifuge, disposable syringes and micropipettes (Fig. 1, 2, 3, and 4).

Four different brands of heat and auto polymerized denture base resins available in India were taken. Resins disks were immersed in artificial Saliva & water at an interval of 1 hour, 24 hrs., 48 hrs. and 120 hrs. Absorbencies of methylemethacrylate were determined by UV spectrophotometer at a wave length of 210 mm. It was found that maximum cone, of MMA was 3.5 X 10-3 V/V % for 24 hrs. & minimum was 0.021 X 10-3 V/V % for 120 hrs.[3]

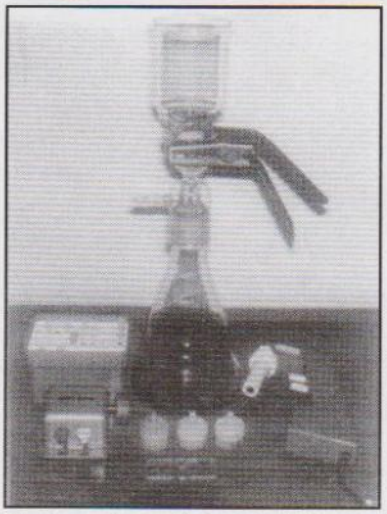

Fig. 1 : Equipments used for cytotoxicity experiment.

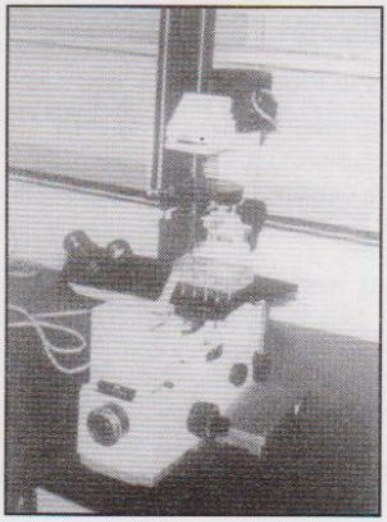

Fig. 2 : Inverted phase contrast microscope

Key Words : Cytotoxicity, methylmethacrylate, inverted phase contrast microscope.

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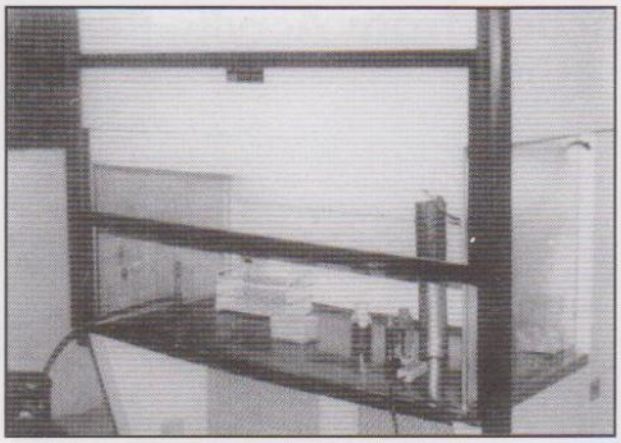

Fig. 3 : Laminar flow hood.

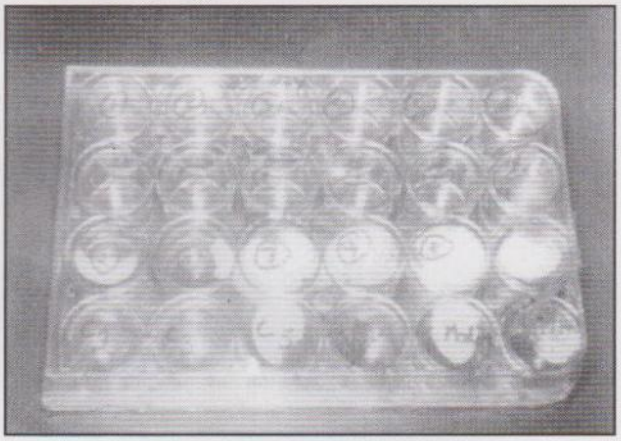

Fig. 4 : 24 well cell culture plate.

The cytotoxicity of methylemethacrylate was studied by cell-culture method.

STERILIZATION

Glasswares were sterilized in hot air oven at 162°C for 2 hrs. Other materials like pipette tips and filtration assembly were autoclaved at 120°C and 15 lb pressure.

MEDIUM PREPARATION

RPMI-1640 medium was prepared from sterile ingredients using aseptic techniques. RPMI-1640 was available in powder form. One litre of triple distilled water was added in a filter asembly containing RPMI-1640 medium.

Culture medium RPMI-1640 (CRPMI) was RPMI-1640 with 10% FCS and antibiotics (Penicillin: 100U/ml; Streptomycin: 10μg/ml). To ensure the sterility of culture medium, foetal calf serum (FCS) and antibiotics were added to RPMI-1640 medium and filtered through 0.22μ, filter membrane using syringe filter. During the use, pH of the culture medium was maintained, pH indicator (Phenol Red) which gave orange red color to the medium.

FREEZING

After getting the cell line from the NFATCC Pune, cells were stored under liquid nitrogen in the corresponding culture medium containing cryoprotectant-dimethyl sulphoxide (5% v/v).

THAWING

L929 cells from frozen stock cultures were taken and cryoprotectant (Dimethyl Sulphoxide) was removed by washing and centrifuging the cells at 1500 rpm for 15 minutes.

CELL LINE MAINTENANCE

Cells were then resuspended in fresh culture medium and subcultured (feeding the cells by changing medium when indicator dye turned yellow) minimum two times before use. Before starting the experiment, adherent monolayer of the cell was removed from the surface of the flask by trypsinization.

TRYPSINIZATON

Culture medium from the flask was removed using micropipettes and washed with RPMI-1640 to remove all traces fo FCS. 3ml of trypsin EDTA solution was added to the tissue culture flask and incubated at 37°C for 10 minutes to detach the cells from the surface of the flask. Then cells were flushed and washed with RPMI-1640 to remove trypsin EDTA followed by resuspension of the cells in culture medium to make a concentration of 5 x 10^4 cells/ml.

TEST PROCEDURE

900μl of the above cell suspension and 100μl of methylmethacrylate (0.021 X 10^{-3}, 0.218 X 10^{-3}, 0.437 X 10^{-3}, 0.875 X 10^{-3}, 1.75 X 10^{-3}, 3.5 X 10^{-3} v/v/ %) were added to a 24 well flat bottom cell culture plate with a culture area of 2 cm^2 and incubated in 90% humidified atmosphere of 5% CO_2 in air at 37° ± 2°C for 2, 3 and 5 days. The supernatant was discarded and 0.25 trypsin solution (500ml) was added to cell culture plate. After incubation for 5 minutes, at 37°C, the cells were suspended in medium (1ml) and counted in a hemocytometer. Mean values for cell number/cm^2 of culture area were obtained by counting five times per sample. Cytotoxicity was evaluated by determining the relative ratios of cell numbers to control values.

RESULTS

For evaluation of cytotoxicity of MMA cell numbers/cm^2/ml were calculated and the relative ratio (%) of cell numbers to control were determined by using the following formula.[2]