ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 12, Issue, 07, pp.12200-12204, July, 2020

DOI: https://doi.org/10.24941/ijcr.38966.07.2020

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

RE ESTABLISHING FACIAL ESTHETICS OF A BURNS' PATIENT USING MAXILLOFACIAL PROSTHETICS

Dr. Jay R. Dondani[1,*], Dr. Jyoti Tembhurne[2], Dr. Arti Gangurde[3] and Dr. Vikrant Pardeshi[4]

[1]Postgraduate student, Department of Prosthodontics, GDC Mumbai, India
[2]Professor and Head, Department of Prosthodontics, GDC Mumbai, India
[3]Associate Professor, Department of Prosthodontics, GDC Mumbai, India
[4] Postgraduate student, Department of Prosthodontics, GDC Mumbai, India

ARTICLE INFO

Article History:
Received 20th April, 2020
Received in revised form
29th May, 2020
Accepted 27th June, 2020
Published online 25th July, 2020

Key Words:
Silicone, Ocular, Auricular, Maxillofacial.

ABSTRACT

Purpose: The case report highlights the fabrication of an auricular and ocular prostheses of a burns' patient establishing it as a primary treatment modality in similar cases. **Method:** After thorough case history, an auricular and an ocular prostheses were planned for the patient. Conventional impression making with a few alterations were undertaken. Wax patterns were fabricated with the help of indexing from the contralateral auricle and eye respectively. After a thorough try-in the patterns were processed in RTV silicone and heat cure acrylic respectively. The prostheses were delivered and the patient was recalled periodically. **Result:** The rehabilitation of the patient using the auricular and ocular prostheses respectively resulted in considerable improvement in the esthetics of the patient. **Conclusion**: Patients with a history of thermal injury often undergo severe disfigurement of the face. Even with advancements in plastic surgery the contracture of the skin and underlying connective tissue renders it inadequate for optimal esthetics. In such cases maxillofacial prosthetics can play a primary role in facial rehabilitation. Such prostheses result in increase in the patients' confidence and ease in resocialization resulting in improvement in their quality of life.

Citation: ***Dr. Jay R. Dondani, Dr. Jyoti Tembhurne, Dr. Arti Gangurde, Dr. Vikrant Pardeshi*. 2020.** "Re establishing facial esthetics of a burns patient using maxillofacial prosthetics", *International Journal of Current Research*, 12, (07), 12200-12204.

INTRODUCTION

Obturators as well as facial prostheses are imperative for improving the esthetics and for the patients' re-integration into the society. The degree of resocialization is directly proportional to the level of acceptance of the prostheses. Hence the prosthodontist should emphasize of the patients' acceptance of the treatment (Goiato, 2007). A surgical reconstruction is usually very cumbersome and fails to give satisfactory results (Brent, 1981; Furnas, 1978; Tanzer, 1974). Extra oral prostheses boast of advantage of improving not only the patient's appearance, but also enablingearly rehabilitation, making it easy for the examination of the area affected, limiting surgery and time of hospitalization, lowering management cost and enabling the patient to integrate psychosocially (Brenner, 1992). However, hindrances accompany facial prostheses due to connective tissue layer with varying levels of mobility, retention of prosthesis, colour change and compatibility of the skin with the adhesives (Goiato, 2007; Mancuso).

Corresponding author: **Dr. Jay R. Dondani,**
Postgraduate student, Department of Prosthodontics, GDC Mumbai, India.

Similarly, a primary objective whilst rehabilitating an anophthalmic socket with a prosthesisis to help the patient adjust to the process of social rehabilitation (Mancuso, 1997). The disfigurement which is associated with loss of an eye can cause emotional trauma (Lubkin, 1990). Most patients are inconvenienced due to the functional problems associated with the loss of the organ and traumatized due to the reactions of the society (Artopoulou, 2006). Ocular prostheses may be ready-made or customized (Erpf, 1953). However a customized ocular prosthesis made with a stock iris is also an option. Hereby following is a case which entails the prosthetic rehabilitation of a burns' patient with partial right auricle and right anophthalmic socket.

Case report: A 38 year old male patient reported to the Department of Prosthodontics with a chief complaint of missing part of the right auricle and right eye. History revealed partial burns of the right side of the face in an accident 10 years back. Due to the possibility of sepsis of the right eye,it was enucleated. The patient had not undergone any surgical or prosthetic rehabilitation of the ear or eye. Clinical examination of the right orbit revealed loss of space of the orbital bed with intact activity of the extraocular muscles. The conjunctiva was healthy with no signs of inflammation or infection covering the

posterior wall of the anophthalmic socket. The conjunctiva showed synchronous movements. A semi customized ocular prosthesis with stock iris and custom made sclera was planned for the patient.Clinical examination of the right auricle revealed part of the pinna of the ear was missing without any associated hearing defect. The patient was educated about the prosthesis and detailed consent form was obtained.

Auricular Prosthesis: Three lines were drawn on the face taking the superior, middle and inferior border of the natural ear on the left side as reference. The outline was drawn with a marker pen on the defect side and these markings were transferred on the working cast [Figure 1]. The lines were used to orient the prosthesis properly. A preliminary impression was made for both ears using irreversible hydrocolloid impression material (Tropicalgin, Zhermack) after fabrication of a custom enclosure for each individual ear using base plate wax [Figure 2]. A layer of irreversible hydrocolloid was first applied to the ear following which stapler pins were incorporated into the set material which was then supported with a layer of quick setting plaster. While making the impression, facial skin and hair surrounding the ear was protected with petroleum jelly, and auditory canal was blocked with a gauze piece. The impression was then poured with Type III Gypsum product [Figure 3]. The prosthesis can be sculpted from the beginning or 'Donor technique'may be used. For this patient, due to disproportionate remnant of the right ear, the prosthesis was sculpted from the beginning. It was done by dividing the cast of the normal ear into equal sections so that the contours are more easily verified [Figure 4]. The wax prosthesis was tried on the patient and examined for correct fit on the tissue, alignment of the prosthesis in the horizontal and vertical plane and the conspicuousness of the margins during head movements . The pattern was then invested in the denture flask using Type II Gypsum product. The flask was then dewaxed [Figure 5]. Before packing, shade selection was done. Basic stains of vulcanizing silicone were added to base gel of Room Temperature Vulcanizing Silicone (Silastic MDX 4210) and were matched with the affected and contralateral side till the nearest possible match. Separate shades were selected for different parts of the ear. After final shade selection catalyst gel of the RTV silicone was added and packing was done. After curing, the flask was opened, and the prosthesis was critically evaluated for any defect before trimming the excess.

The final prosthesis was tried on the patient [Figure 6,7]. Medical grade silicone adhesive was used to attach a prosthesis to the remaining part of the ear. The patient was instructed regarding the usage of the prosthesis. Application of the adhesive after every 24 hours, regular cleaning of the prosthesis with lauryl sulfate solution and to limit the sun exposure to avoid discoloration of the prosthesis.

Ocular Prosthesis: An impression of the anophthalmic socket was made. In this method a stock clear scleral blank and a heavy gauge syringe was used. A hole was gauged in the scleral blank which was approximately the same diameter as the bore of the syringe. The bore was then mechanically inserted in the orifice of the scleral blank so as to create a pathway for the impression material. A thin mix of irreversible hydrocolloid (Tropicalgin, Zhermack) was then injected through the syringe to obtain the impression of the socket [Figure 8]. Impressions were then reverse beaded with Type II Gypsum product and then poured to obtain a two piece mold.

By using base plate wax and a two piece mold, a wax conformer was poured and retrieved. It was inserted in the ocular cavity and esthetics and stability were evaluated [Figure 9]. It was then sculpted on the anterior surface to mimic and conform to the contours of the contralateral eye. This conformer was then used to fabricate the final acrylic resin ocular prosthesis. The contralateral natural eye was used as a guide to select the shade and size of the iris. Most closely matching iris was selected from the stock eyes (American Optical Corp, Southbridge, Mass). The scleral portion of the eye was trimmed off. The residual iris was placed on the wax conformer and sealed. The position of the iris was confirmed by using contralateral eye. Shade selection for the sclera was done using the natural eye as a guide. The pattern was removed and washed under tap water. An applicator tip for bonding agent was taken and the tip was cut off. To stabilize the stock iris within the mold, this portion of the applicator tip was attached to the center of the stock iris [Figure 10]. Flasking and dewaxing were done in a conventional manner [Figure 11]. Selected shade of the heat cure acrylic resin was manipulated and packed into the prepared mold. Acrylization was done by following a long curing cycle. Resin sclera with the iris attached over it was obtained after deflasking. The portion of the applicator tip got separated from the iris. The flash from the prosthesis was trimmed off, finished and polished and inserted into the socket. The stability of prosthesis, position of the iris and scleral contour was confirmed.

The sclera was characterized for life like appearance of the prosthesis. The original mold obtained by flasking the wax conformer is preserved. The scleral portion of the uncharacterized prosthesis was trimmed to a universal depth of 1mm. The characterization of the sclera was done as following. Monomer of the heat polymerizing clear acrylic and polymer of self polymerizing clear acrylic were mixed in the ratio of 10:1. Acrylic color painting of the sclera was done using soft color tones of yellow, brown, red and gray after dipping the painting brush in the solution created. The painted prosthesis is packed in the flask previously mentioned with clear heat polymerizing acrylic which will replace the trimmed portion. Processing of the prosthesis was done in the usually manner. The prosthesis was then tried in the socket and evaluated for stability and contour [Figure 12]. Post insertion instructions were given to the patient regarding the limitations, precautions and maintenance of the prosthesis. Due to burns, the right eyelashes were also frayed and sparce. adhesive false eyelashes were applied on both the upper eyelids. The patient was instructed to clean them daily and reapply them with the adhesive provided for the auricular prosthesis.

DISCUSSION

A vast array of modern materials have been utilized for the fabrication of an auricular prosthesis. Silicone elastomers are the materials of choice because of their chemical inertness, strength and durability (Andres *et al*., 1992). However, silicone elastomers are not colour stable (Gary, 1998). Mckinstry found that after 3 years of service the patient satisfaction declines (McKinstry, 1995). This phenomenon may be accounted to the fact that according to the patient colour change is the most significant parameter to be considered when gauging the success of the prosthesis (Jani, 1978; Chen, 1981; Watson, 1995). Traditionally retention of the prosthesis have involved the use of medical skin grade adhesives, solvents, eyeglasses, the use of hard and soft tissue undercuts and other modalities (Beumer, 1996).

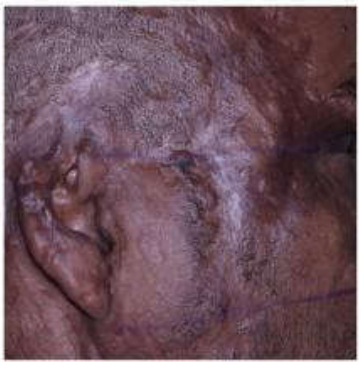
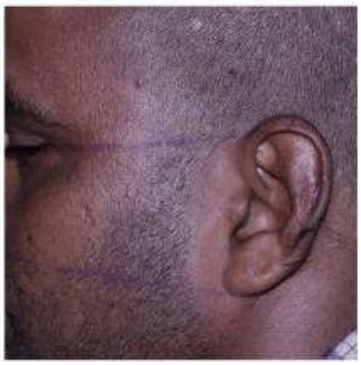

Figure 1: Markings drawn on both sides for orientation of the prosthesis

Figure 2 : Customised enclosure for the auricle


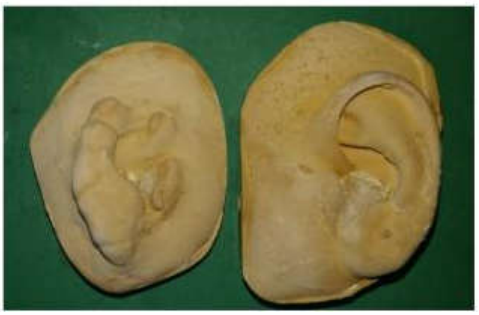

Figure 3: Impressions of the defect and normal auricle and their respective models

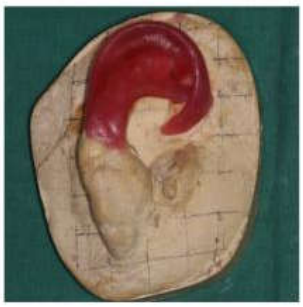
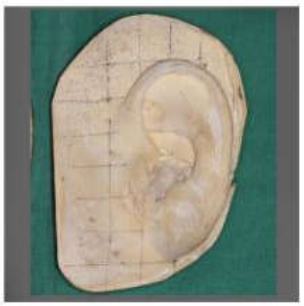

Figure 4 : Wax up of the prosthesis with reference from the grid transferred from the markings on the skin

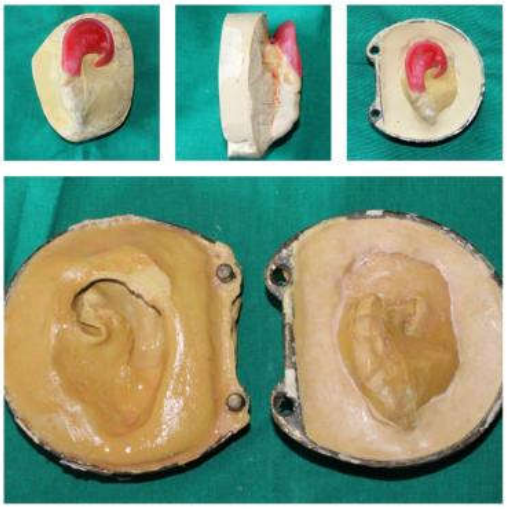

Figure 5 : Flasking and dewaxing of the pattern

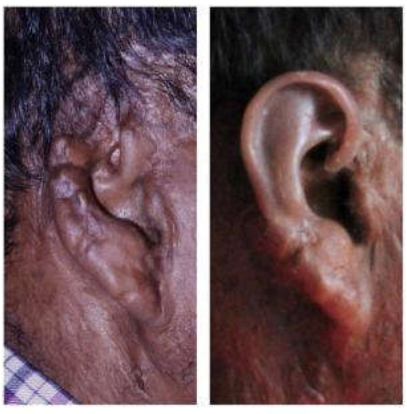

Figure 6:Try-in of the prosthesis

Figure 7: Final prosthesis

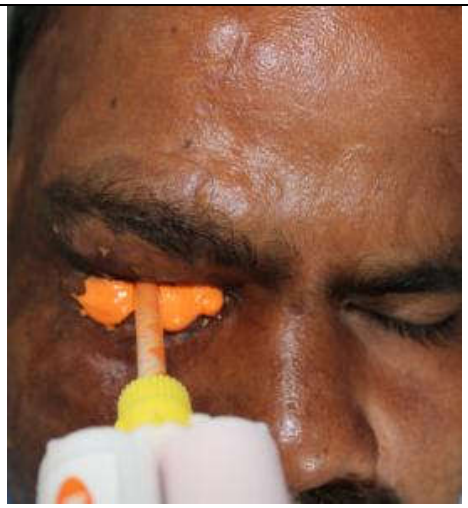

Figure 8 :Impression of the anopthalmic socket

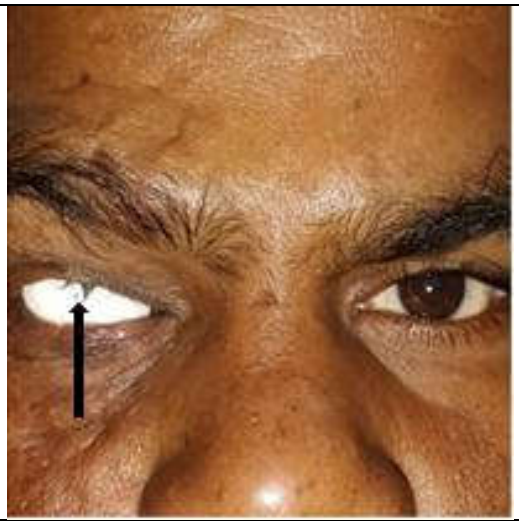

Figure 9: Try in of the contour of the pattern and location of the pupil

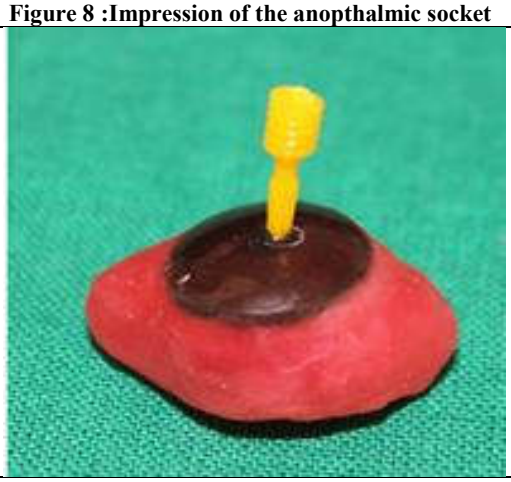

Figure 10: Attachment of the applicator tip to the pattern

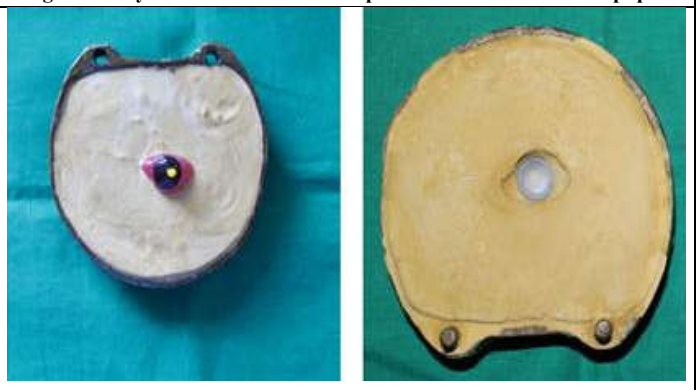

Figure 11: Flasking and dewaxing of the pattern

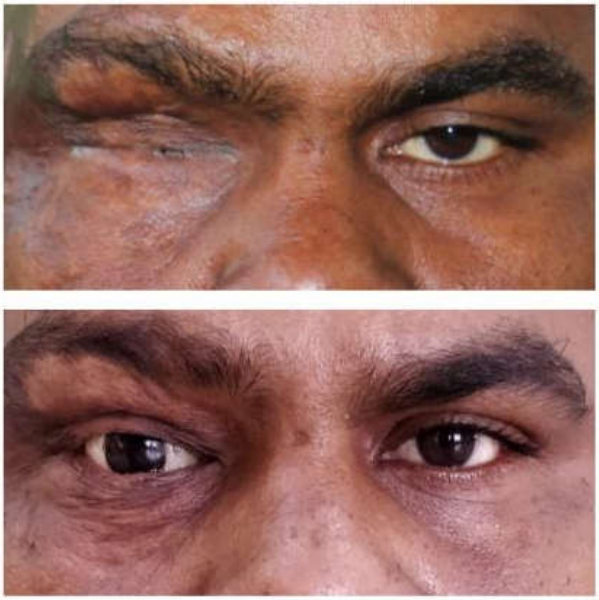

Figure 12: Patient without and with the ocular prosthesis respectively

Unfortunately, these modalities are often riddled with difficulties associated with stability, adverse skin reactions, discoloration and prosthesis deterioration, inconvenience of use or application, retention, discomfort or lack of acceptance (Jani, 1978; Chen, 1981). There was a paucity of techniques deployed to evaluate the level of patient satisfaction and the problems encountered by the patient in handling the prosthesis. The need for a prosthetic eye can sometimes be satisfied by stock prostheses that come in standard sizes, shapes and colors (Rahn, 1970; Chalian, 1979; Sykes, 1996).

Stock prostheses are relatively inexpensive and can be delivered quickly (Rahn, 1970; Welden, 1956; Cain, 1982; Smith, 1995). Often, however, a custom ocular prosthesis is indicated (Sykes, 1996; Welden, 1956; Cain, 1982; Smith, 1995; Bartlett, 1973; Taicher, 1985). Advantages include improved conformity to the recipient site, enhanced mobility of the entire complex and improved esthetics due to customization of the sclera and iris with respect to size and colour of the contralateral side (Cain, 1982; Smith, 1995;

Bartlett, 1973; Brown, 1970; Schneider, 1986; Ow, 1997). Nevertheless the expense involved and the multiple steps involved in the fabrication of the prosthesis renders it a very demanding procedure (Rahn, 1970; Welden, 1956; Schneider, 1986). A custom prosthesis constituting a shade and size matched iris from a stock scleral blank which is incorporated into a custom made sclera fabricated using the patient's measurements of the enucleated socket seems to be a viable option. A variety of techniques for impression and conforming the prosthesis to the socket have been presented. Most can be placed into one of several broad categories: direct impression/ external impression, impression with a stock ocular tray or modified stock ocular tray, impression with custom ocular tray, impression with stock ocular prosthesis, ocular prosthesis modification, and the wax scleral blank technique. The selection of the technique employed is subject to the operator's preference, anatomy of the receipient site and the financial willingness of the patient. The ultimate goal of the treatment modality is the replication of anatomy akin to the contralateral normal side.

Conflict of interest: The authors declare no conflict of interest

REFERENCES

Andres CJ, Haug SP, Munoz CA, *et al*. Effects of environmental factors on maxillofacial elastomers: part I - literature review. J Prosthet Dent 1992;68:327-30.

Artopoulou II, Montogomery PC, Wesley PJ, Lemon JC. Digital imaging in the fabrication of ocular prostheses. J Prosthet Dent 2006; 95: 327–30.

Bartlett SO, Moore DJ. 1973. Ocular prosthesis: A physiologic system. *J Prosthet Dent.,* 29:450-9

Beumer J, Ma T, Marunick M, *et al*., 1996. Restoration of facial defects. In: Beumer J, editor. Maxillofacial rehabilitation prosthetic and surgical Considerations. St. Louis, MO: IshiyakuEuroAmerica; 1996: 377-453.

Brenner P, Berger A. 1992. Epitheses of the face. Handchir Mikrochir Plast Chir., 24:88-92.

Brent B. 1981. A personal approach to total auricular reconstruction: case study. *Clin Plast Surg.,* 8:211-21

Brown KE. 1970. Fabrication of an ocular prosthesis. *J Prosthet Dent.,* 24:225-35

Cain JR. 1982. Custom ocular prosthetics. *J Prosthet Dent.,* 48:690-4

Chalian VA. 1979. Treating the patient with facial defects, in Laney WB (ed): Maxillofacial Prosthetics. Littleton, MA, PSG Publishing Co 286

Chen S, Udagama A, Drane JB. Evaluation of facial prostheses for head and neck cancer patients. J Prosthet Dent 1981;46: 538-44.

Erpf SF. Comparative features of plastic and/or glass in artificial-eye construction. Arch Ophthalmol 1953; 50: 737.

Furnas DW. 1978. Symposium on deformities of the external ear. In: Furnas DW, editor. Clinical plastic surgery, vol. 8. Philadelphia: WB. Saunders Co: 315-498.

Gary JJ, Smith CT. Pigments and their application in maxillofacial elastomers: a literature review. J Prosthet Dent 1998; 80:204-8.

Goiato MC, AUR Fernandes, dos Santos DM, *et al*., 2007. Positioning magnets on a multiple/ sectional maxillofacial prosthesis. *J Contemp Dent Pract.,* 7:101-7.

Jani RM, Schaaf NG. An evaluation of facial prostheses. J Prosthet Dent 1978;39:546-50.

LubkinV,Sloan S. 1990. Enucleation and psychic trauma. *Adv Ophthalmic Plast Reconstr Surg.,* 8: 259–62.

Mancuso DN, Goiato MC, Dekon SFC. Evaluation visual of color stability after accelerated aging of pigmented and non pigmented silicones to be used in facial prostheses. Indian J Dent Res, in Press.

McKinstry RE. Fundamentals of facial prostheses. Clearwater (FL): ABI Professional Publications; 1995:198.

Ow RK, Amrith S. 1997. Ocular prosthetics: Use of a tissue conditioner material to modify a stock ocular prosthesis. *J Prosthet Dent.,* 78:218-22

Ow RKK, Amrith S. 1997. Ocular prosthetics: use of a tissue conditioner material to modify a stock ocular prosthesis. *J Prosthet Dent.,* 78: 218–22.

Rahn AO, Boucher LJ: Orbital and ocular prostheses, in Rahn AO, Boucher LJ. 1970. (eds): Maxillofacial Prosthetics: Principles and Concepts. Philadelphia, PA, Saunders,: 164-7

Schneider RL: Modified ocular prosthesis impression technique. J Prosthet Dent 1986;55:482-5

Smith RM. 1995. Relining an ocular prosthesis: A case report. *J Prosthodont.,* 4:160-3

Sykes LM. 1996. Custom made ocular prostheses: A clinical report. *J Prosthet Dent.,*75:1-3

Taicher S, Steinberg HM, Tubiana I, *et al*. 1985. Modified stockeye ocular prosthesis. *J Prosthet Dent.,* 54:95-8

Tanzer RC, Edgerton MT, 1974. editors. Symposium on reconstruction of the auricle. St. Louis: CV Mosby Co:47.

Watson RM, Coward TJ, Forman GH. Results of treatment of 20 patients with implant-retained auricular prostheses. Int J Oral Maxillofac Implants 1995;10:445-9.

Welden RB, Niiranen JV. 1956. Ocular prosthesis. *J Prosthet Dent.,* 6:272-8

****