

Ocular impressions: An overview

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The making of an ocular prosthesis after enucleation of the eye or the making of a cover shell prosthesis following evisceration requires an impression of the remaining ocular tissues. An accurate impression of these tissues facilitates a close adaptation of the custom prosthesis to the tissue bed, resulting in better potential for movement. This article reviews various ocular impression techniques as proposed by various authors.

Key words: Custom tray ocular impressions, eye impression technique, impression materials in ocular impressions

CLINICAL RELEVANCE

This paper aims to guide and give choices for ocular impressions, which is a very important step in fabrication of an ocular prosthesis depending on the operator's experience, patient's presentation and the material and equipment available.

Sensory organs play a significant role in our daily lives. The most tragic yet, unfortunately, the most commonly occurring loss of these sensory organs is that of the eyes. Eyes are generally the first features of the face to be noticed and the presence of a pair of eyes is quite essential to maintain the balance and the esthetics of a face. The goal of any ocular prosthetic procedure is to enable rehabilitation of the patient in society with a normal appearance and reasonable mobility of the prosthetic eye.

The indications^[1] for the surgical removal of an eye are irreparable trauma like bomb explosions, fights, infection, tumor, blindness, pain in the eye, the need for histological confirmation of a suspected diagnosis, possible prevention of sympathetic ophthalmia and cosmetic reasons. Surgical procedures adopted for the removal of an eye are classified into three general categories: evisceration, enucleation and exenteration. Ocular prostheses can be given to patients who have lost ocular structures through orbital evisceration or orbital enucleation.^[2]

Ocular prostheses can be either readymade (stock) or custom-made. Stock eyes have some advantages including better mobility, even distribution of pressure due to equal movement thereby reducing incidence of ulceration, improved fit, comfort and adaptation,

improved facial contours and esthetics. Stock eyes enhance tissue health by reducing potential stagnation spaces at the prosthesis-tissue interface.

One of the most important steps in making accurate impressions is the close adaptation of the mucosal surface of the ocular prosthesis to the posterior wall of the eye socket.

While going through the available literature, we came across numerous ocular impression techniques. This article reviews the various ocular impression techniques proposed by different authors based on impression materials used by them.

The different impression materials which can be used for ocular impressions are irreversible hydrocolloids, ophthalmic alginates, tissue conditioners, polyvinyl siloxane impression materials and dental impression waxes like korecta wax no,4 and Iowa wax.

IRREVERSIBLE HYDROCOLLOIDS

Barlett and Moore^[3] advocate mixing alginate impression material with excess water until it is very free flowing, sacrificing strength to avoid tissue distortion and fill the mix in a disposable plastic syringe. Later the eyelids are drawn gently apart and the impression material is introduced at the inner side of the palpebral opening. Excess material is to be ejected from the syringe over and around the lids. During this procedure, the patient is asked to gaze at a fixed point so that the pupil is well-centered.

Taylor^[2] recommends a similar technique and calls it the external tray impression technique. He advocates placing a perforated acrylic resin backing!

tray for reinforcement. As a result, the anatomy of the anophthalmic socket and overlying tissues is obtained. A stone mold is made from the impression and wax is poured into this mould. The wax form or scleral bank acts as a trial ocular prosthesis and it should be tried in the patient and adjusted to achieve proper tissue contours and fit before acrylisation. !

Welden and Nilranen^[4] also suggested alginate material as the impression material of choice but their technique involved selecting an esthetic stock eye. The peripheral borders of the stock eye are reduced according to the anophthalmic socket contours. A thin alginate mix is to be applied to the prepared posterior portion of the stock eye and gently inserted into the anophthalmic socket. The resulting impression is processed providing a customized stock prosthesis. In this technique, the stock eye itself acts as a tray for the impression material. !

OPHTHALMIC ALGINATE

Allen and Webster^[5] recommended a stock ocular tray which is perforated which helps in the retention of the alginate for making ocular impressions. They recommended using ophthalmic alginate. !

Cain^[6] recommended Allen and Webster's technique and called it the modified impression technique. He suggested using an impression tray with a hollow stem in the shape of the ocular prosthesis. He did not mention fabrication of the impression tray. He used ophthalmic alginate (Ophthalmic Moldite, Milton Roy Co, Sarasota, Fla.) and suggested mixing it with enough water so that it flows easily and asked to inject the mixed material in excess through the hollow stem of the impression tray with the help of a syringe. Once the impression material had set, he recommended making a two piece dental stone mold to make the wax conformer. !

Brown^[7] advocated an external impression tray technique in which the ophthalmic irreversible hydrocolloid is to be mixed in proper proportions specified by the manufacturer and then injected into the ocular defect by means of a syringe until excess material is ejected out over and around the eye lids. Later he recommended the use of an edentulous perforated tray with additional impression material over the eye region allowing the material to combine with the extruded material. !

Engelmeier^[8] suggested casting a set of stock trays in ticonium which is a nonprecious, removable partial denture alloy (Ticonium Co, Albany, NY) which can be sterilized in an autoclave for reuse. The impression material of his choice was ophthalmic alginate. !

Taicher, Steinberg, Tubiana^[9] also recommended a similar technique based on Welden and Niiranen's !

technique. They stated that the monoplex system (American optical corp, South Bridge, Mass) offered a variety of kits that adequately matched iris and scleral colors of most patients. They advised painting the alginate adhesive (Schein's tray adhesive, Henry Schein Inc, Portwash, NY) before injecting the ophthalmic irreversible hydrocolloid. When the impression material is thoroughly set, it is carefully removed and invested in a two piece mold with dental stone. !

POLYVINYL SILOXANE IMPRESSION MATERIAL

Sykes^[10] used medium viscosity polyvinyl siloxane impression material. A modification of the technique described by Taicher *et al.* was performed by the author. He used wax conformer instead of prefabricated eyes as a tray which is explained in his article. !

TISSUE CONDITIONERS

Ow and Amrith^[11] advocated the use of tissue conditioners as a relining material because of its biocompatibility and ease of manipulation. A suitable stock acrylic resin prosthesis was selected and is modified by trimming its periphery to fit the eye socket Visogel (Detrey Division, Dentsply Ltd., Surrey, England) is added and inserted for 20 minutes. Excess material is removed and ocular prosthesis is worn for 24-48 hours. If the esthetics and adaptation are acceptable, the prosthesis is relined with heat cure resin. !

DENTAL IMPRESSION WAXES

Schneider^[12] described a wax blank obtained by duplicating the patient's conformer. He stated that the surgical conformer would not provide ideal support or contour to the surrounding tissues. Therefore, he suggested modifying the wax conformer with body temperature impression Iowa wax (Sybron/Kerr, Romulus, Mich) to improve the orbital and palpebral contours. !

Smith^[13] described a relining procedure for an existing ocular prosthesis. The ocular prosthesis was reduced in size until it fit comfortably in the socket. Melted base plate wax was added to the borders until the ocular prosthesis was positioned correctly. A thin layer of Korrekta wax No: 4 (DR Miner Dental orinda, CA) was added to intaglio surface and borders. The prosthesis was then dipped into 123°F water bath, inserted and left for five minutes. When all dimensions of the ocular prosthesis appeared to be correct, it was left for 30 minutes while the patient intermittently moved his eyes in all directions. A laboratory relining procedure !

was performed in a traditional manner. !

SUMMARY

! This article reviews the various ocular impression ! techniques proposed by different authors based on ! impression materials used by them. Thus, this review ! provides a choice for the clinician to choose an ! impression technique depending on the availability ! of the impression material.

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