

A CASE REPORT

An instrument for measuring the ear axis in the fabrication of Auricular Prosthesis

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ABSTRACT

Success of auricular prosthesis depends on various factors, of which, symmetry of the prosthesis with the natural ear is very important. The orientation of the prosthetic ear is assessed by visual perception. An Instrument to measure the symmetry will be of clinical importance and the job of the prosthodontist will be easy. An instrument was designed to assess the symmetry and it will be a very useful tool.

Key words: Auricular prosthesis, Ear axis

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INTRODUCTION

Defects occur in body parts either by birth (Congenital) or by trauma. Such defects which lead to loss of body parts have direct impact on the affected individual. When the defects occur in the facial structure the impact is doubled. Among them, defects of the ear are worth mentioning. Ear loss is due to congenital defects, trauma, and carcinoma.¹ The prevalence of ear defects from 1987 to 2017 was analysed in a literature survey. It was found that 794 patients reported for ear loss, of which the major cause was due to congenital defect followed by carcinoma and trauma.² Epidemiology of congenital malformations of the external ear in Hunan province China from 2016 to 2020 was assessed using the data from birth defect surveillance system. A total of 185 microtia/anotia were identified and the prevalence is 17.06%.³ The rehabilitation of the ear defects can be done by autogenous tissue reconstruction and alloplastic ear reconstruction. Prosthodontic rehabilitation of patient with ear loss is a challenging task.

The shape of the natural ear is a defining feature of the face. Its shape and size is influenced by age, sex and ethnic origin. Ear appearance and symmetry contribute to facial aesthetics. Success in the field of maxillofacial prosthodontics depends greatly on having the right knowledge of the associated dental material sciences, just like it does in any other dental specialty.⁴ Patient acceptance of the prosthetic ear is decided by the shade matching, correct size, position and symmetry and correct axis with the opposite ear. An instrument was designed to measure the ear axis. This article discusses about the clinical tip for measuring the ear axis.

Instrument for measuring the ear axis:

1. The axis of the ear is measured using a device shown in Fig. 1.
2. Ear axis is measured by the angle between the long axis of the ear and the other line in front of tragus and external acoustic meatus (Fig 2).

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Fig 1 – Ear axis measurement on human individuals

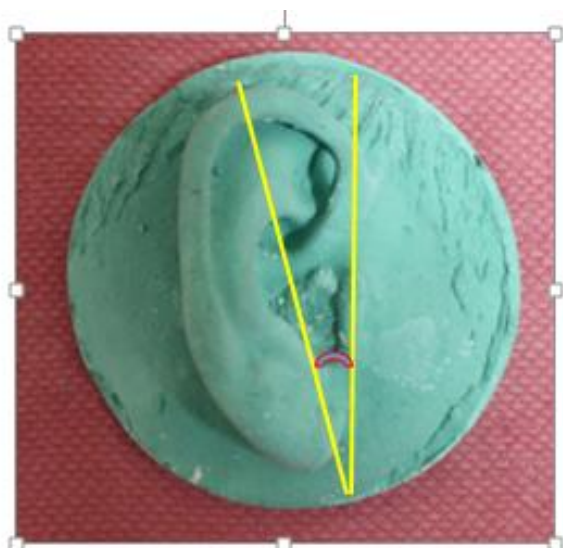


Fig 2 – Angel between the two line is the axis of the ear

3. The device has two vertical rods attached to the protractor at the bottom. The solid rod is firmly fixed to the protractor and the thin rod is movable.
4. The thicker rod is rigid and fixed to the protector and not moveable. Thick rod is oriented in front of the external acoustic meatus and tragus as reference landmark. The entire assembly is fixed to the head using a strap shown in (Fig.1)
5. Once the thicker rod is oriented to the anatomical landmark as specified above, the thinner rod is adjusted parallel to the long axis of the ear. The angle formed between the

thicker rod and thinner rod is noted over the protractor (Fig 3)



Fig 3 – Procedure for measuring the ear axis

5. This angle on the normal side can be used to orient the prosthetic ear.
6. Ear wax pattern can be positioned on the defective side. The instrument for measuring the ear axis is oriented using the anatomical landmark and the angle is measured on the normal side.

DISCUSSION

The success of the implant supported prosthesis is not only the placement of the implant but the prosthesis in the correct form position and color decide the success. Tolleth et al.⁵ proposed three criteria for the positioning of the ear - level, Distance from the orbit and axis of the ear . The upper level of the ear should be at that of the eyebrow and the lowest part of the lobule should be at the level of columella or below⁵ The distance from lateral orbital ear to the position of the ear is one ear length or 6.5 to 7.5cm.⁵ The ideal ear axis is measured and reported as 20 degree.⁵ The axis is measured between two vertical lines, one vertical line parallel to the bridge of the nose and the other axis is to the long axis of the ear .The intersection of the two gives the axis. The ideal axis is 20 degree.⁶ Skaria et al.⁵ conducted morphometric measurement of ear in which he measured ear length, width, axis, lobule length and width on 420 volunteers. The shape of the ear is decided by the individual preference and choice .This instrument for measuring the ear axis is first of its kind. A similar design with protractor was used to measure the angle of multiunit abutment ⁷.This ear axis measuring device will be help full for the prosthodontist to position the artificial ear at the

correct axis and can maintain the symmetry with the adjacent ear.

CONCLUSION

The instrument for measuring the ear axis is first of its kind. The design of the instrument does not require any complicated armamentarium and can be used to get predictable result. Copying of ear axis from the natural ear and replicate to the prosthetic ear can provide the patient more satisfactory prosthesis.

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