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### RESEARCH ARTICLE

#### AN EVALUATION OF RELATIVE PARALLELISM OF OCCLUSAL PLANE TO ALA TRAGAL LINE IN YOUNGER AGE INDIVIDUALS.

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##### Key words:-

Occlusal plane, tragal line, complete denture, occlusion.

#### Abstract

**Background:** Complete denture construction is a product of biological sciences as well as sound mechanical principles. Correct orientation of the occlusal plane plays a vital role in achieving optimal aesthetics, occlusal balance and function of complete dentures. The occlusal plane is normally established anteriorly according to aesthetics of patient and posteriorly parallel to camper's plane. This study is done to establish the effect of age and ala-tragal line.

**Aim:** The purpose of this study is to evaluate relative parallelism of the occlusal plane to the different tragal levels of the ear

**Materials and method:** A total of 25 subjects with complete denture between the age group 18-25 years were selected. Fox plane was placed intraorally covered with dental wax, between their natural teeth, so that it touched incisal edges of upper incisors and cusps of left and right upper first molars and the subjects were asked to hold fox plane in this position. Left lateral profile photographs were taken with subjects in natural head position with their back straight.

**Result:** The relationship between the occlusal plane and the inferior border of ala-tragus was about 76%. The inferior border of the ala-tragus line was almost parallel to the occlusal plane when considered as posterior reference point in young adult age group.

**Conclusion:** The inferior border of the ala tragal line is suggested as the best posterior reference point in younger age individuals.

Keywords: complete denture, occlusal plane, posterior reference point, ala tragal line.

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#### Introduction:-

Orientation of the occlusal plane is one of the most important clinical procedures in prosthodontic rehabilitation of edentulous patients and because of its effect on aesthetics, function and denture stability, it should be reconstructed as identical as possible to the occlusal plane of missing natural teeth<sup>1,3</sup>

The glossary of prosthodontic terms-8 defines occlusal plane as "the average plane established by the incisal and

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occlusal surfaces of the teeth. Generally, it is not a plane but represents the planar mean of the curvature of these surfaces”<sup>2</sup>

Ghosn et al., Koller et al., Rostamkhani et al., and Sharifi and Rostamkhani, in their study found out that the occlusal plane had a stronger tendency to be parallel to the line joining the ala of the nose and inferior border of the tragus. Braun et al., in their study of the human dental arch form concluded that Camper’s plane was found to be parallel to the occlusal plane when the tragal reference point was situated between the superior border and the middle of the tragus.<sup>8</sup>

Various landmarks and techniques had been used over the years by clinicians and researchers for establishing this plane, which include: Orientating the occlusal plane with the buccinator grooves and the commissure of the lip. Terminating the occlusal plane posteriorly at the middle or upper third of the retromolar pad, positioning the occlusal plane on the same level as the lateral border of the tongue and many more concepts have been reported in literature.<sup>7</sup> To aid in rehabilitation of occlusal plane numerous reference planes and landmarks have been suggested. Out of these, Campers planes is the most commonly used reference plane.<sup>10</sup>

Relationship exists in between age groups and level of alatragus line. In young adult age group, occlusal plane was found to be more parallel to Ala-Tragus line when inferior border of tragus was considered as posterior reference point and hence should be used as a posterior reference point in establishing occlusal plane in completely edentulous patients in young age group. In middle age and old age group, both middle and superior border of tragus can be taken as posterior reference point while orienting the occlusal plane for these age groups.<sup>9</sup>

The aim of this study was to correlate the best posterior reference point of ala-tragus line for orientation of the occlusal plane in dentate individuals.

### Materials and Method:-

A total of 25 subjects with complete denture between the age group 18-25 years were selected. Exclusion criteria were as follows:

1. Previous orthodontic and prosthodontic treatment and history of aesthetic surgery.
2. Facial asymmetry and craniofacial anomaly.
3. Overjet and overbite over 2 mm.

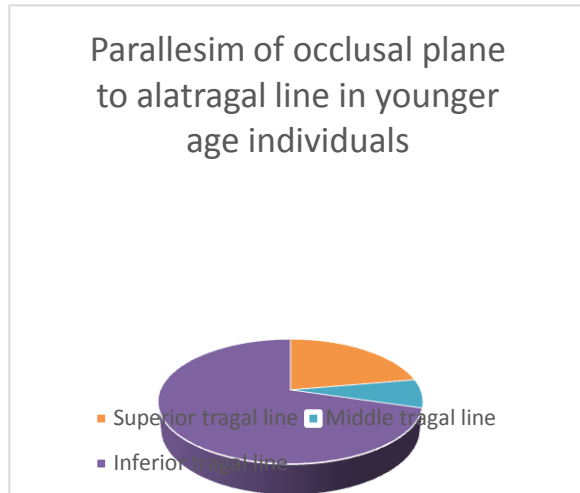
In this study, iPad Pro with a resolution of 5 mega pixels was used. Fox plane was placed intraorally, so that it touched incisal edges of upper incisors and cusps of left and right upper first molars and the subjects were asked to hold fox plane, covered with dental wax, between their natural teeth. Left lateral profile photographs were taken with subjects in natural head position with their back straight. Then the photographs were traced. After tracing the photographs, the angle between fox plane and superior border of alatragal line, angle between fox plane and middle border of alatragal line and angle between fox plane and inferior border of alatragal line was measured and was statistically analysed.<sup>7</sup>

**Figure 1:-**



**Result:-**

After statistical analysis, the results were tabulated and assessed. Out of 25 subjects, 19 subjects had parallelism between fox plane and inferior border of alartragal line while 3 subjects had parallelism between fox plane and superior border of alartragal line and 2 subjects had parallelism between fox plane and middle border of alartragal line. Thus the results show that inferior border of alartragal line shows stronger tendency to be parallel to the fox plane.



**Figure 2:-** Parallesim of occlusal plane to alatragal line in younger age individuals.

**Discussion:-**

There is a controversy for the orientation of the occlusal plane during complete denture fabrication. Some of the existing concepts regarding orientation of the occlusal plane in the edentulous patients are of the opinion that the occlusal plane has relation with Camper's line. It is the oldest, simplest and most commonly used method.<sup>7</sup> Camper's plane is not parallel to natural occlusal plane in Indians and if it is taken as a reference for orientation of occlusal plane in edentulous patients its inclination should also be given a consideration for prosthodontic rehabilitation.<sup>4</sup> According to Boucher<sup>6</sup>, "It seems to be obvious that if the soft tissue surrounding the denture is to work around as they did around natural teeth, occlusal plane should be oriented exactly as it was when the natural teeth were present". As the prosthodontic intervention imposes most of its influence on the denture stability, due importance must be given in analyzing the occlusal plane level, which is the main contributing factor in denture stability. The position of the occlusal plane of orientation also forms the basis for ideal tooth arrangement and fulfills the necessary mechanical, esthetic and phonetic requirements and aid respiration and deglutition.<sup>5</sup>

According to the result of the present study, there is no parallelism between the occlusal plane and the ala-tragus line with three different posterior ends. The relationship between the occlusal plane and the ala-superior border of tragus was about 16%; the relationship between the occlusal plane and the middle of ala-tragus was about 8%; and the relationship between the occlusal plane and the inferior border of ala-tragus was about 76%. The inferior border of the ala-tragus line is almost parallel to the occlusal plane.

When occlusal plane is established such that it is high posteriorly, it follows the curvature of ramus and enables teeth to be set in such a way that there are least interferences during protrusive movements. These interferences if ignored can significantly decrease stability of dentures. It must be constantly kept in mind that occlusal plane is determined by dynamics of function and not by any particular static relationship.<sup>11</sup>

**Conclusion:-**

This study concludes that the inferior border of alartragal line as the posterior reference point in younger age individuals. This study is useful in choosing the occlusal plane in various situations such as in partially edentulous patients due to trauma or accident, congenitally missing teeth, hypodontia is the most frequent human malformation. Hypodontia is from a single missing tooth to the absence of all permanent teeth called anodontia.

Oligodontia is usually defined as the absence of six or more permanent teeth. Further studies can be conducted to determine the exact cause and relationship between age and level of occlusal plane.

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