A Modified Technique for Establishing the Occlusal Plane in Complete Denture Prosthesis

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Abstract
Occlusal plane position is considered to be the primary link between function and esthetics. Canted occlusal planes result from the canted interpupillary line if the latter issued as reference plane. Establishing this occlusal plane correctly by orienting is of prime importance. Bubble gauge mounted to the fox plane provides more accurate orientation of occlusal plane irrespective of reference planes. This modification can be used to achieve optimum result in facial asymmetries and canted interpupillary lines, since interpupillary line cannot be used as a guide in such cases.

Clinical Implications: If a clinician uses bubble gauge-fox plane approach for establishing occlusal plane, then the aesthetic outcome will be enhanced. This method is also of value since it reduces subjective variations.

Keywords: Occlusal cants, reference planes, complete denture esthetics, interpupillary line.

Introduction
Occlusal plane is the average plane established by the incisal and occlusal surfaces of the teeth. Generally, it is not a plane but represents the planar mean of the curvature of these surfaces. The orientation of the occlusal plane is lost in patients rendered edentulous and should be relocated if complete dentures are to be esthetic and to function satisfactorily. It is the most important plane to be determined in complete denture work, as it is a vital and important basis for tooth arrangement. Complete dentures are constructed to function in the mouth as an integral part of the masticatory system; therefore, they should be designed to conform to the patient’s physiologic jaw relations. The plane of occlusion forms one essential physiologic concept of jaw relation and occlusion. A well-contoured occlusal rim with occlusal plane parallel to ridge posteriorly and parallel to interpupillary line anteriorly stabilizes the denture.

During the maxillomandibular relations after forming the rim with the correct vertical heights, the plane of occlusion is modified until it is parallel with a line projected from ala of nose to the superior edge of the tragus of ear (Camper’s line). The incisal-canine esthetic line should be made parallel to the interpupillary line when the patient is looking straight ahead.

An occlusal plane indicator such as a Fox plane guide is used to achieve this goal. In practice, a metallic scale is used along with Fox plane. The Fox plane is placed inside the mouth touching the occlusal rim and is held by the operator, while the metal scale is held at the level of Camper’s line or interpupillary line. Conventional method have the following disadvantages:

- It is difficult to hold the scale steady. The scale position changes every time the operator checks the parallelism. Moreover, when checking with naked eye, the operator has to be at eye-level to check the parallelism as any change in angulation of eye leads to incorrect results. This not only increases the chances of error but also makes the procedure tedious and time-consuming. Trying to imagine the interpupillary line and

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comparing it with the Fox plane guide is quite difficult. It is difficult for the practitioner to compare between the fox plane guide and an instrument that represents the interpupillary line with a distance of several centimetres apart. It is difficult to fix or stabilize the pupils because the patient doesn’t understand the importance of stabilizing the pupils, nor does he/she know in which correct position to stabilize the pupils. In elderly subjects who receive the majority of the complete dentures the muscle coordination is poor.

A range of facial asymmetries can influence the choice of occlusal plane during prosthodontic treatment. Thus, an occlusal plane parallel to the ala tragus and interpupillary lines, as often supported by prosthodontists, may result in less than ideal esthetics in the final restoration. In the event that one eye is higher than the other (which often occurs), the incisal-canine line would be made slanted in relation to true horizontal when the patient’s head is erect. The interpupillary is not the best esthetic reference line and has advocated making the incisal-canine line parallel to horizontal when the patient’s head is perfectly erect regardless of the eyes or any other facial feature.

To overcome the above disadvantages a modification to the Fox plane in which, bubble gauge is mounted to the Fox plane (Fig 1). The bubble gauge consists of coloured liquid in a tube consisting of bubble and markings in the centre. The presence of the bubble in between the markings indicates that the surface is parallel to ground level or the true horizontal. Bubble gauge is used in automobile industry, water level monitoring etc. Applying the same principle to complete denture prosthodontics, it can be used in maxillomandibular relations procedure where the planes are of utmost significance.

Procedure for use of bubble gauge: The patient is made to sit erect looking straight ahead at horizon. The labial form of occlusal rim should provide adequate lip support and labial fullness. The vertical length of the maxillary occlusion rim is established. The occlusal plane is adjusted using the centralisation of bubble in between the markings as a guide (Fig 2). The procedure is carried out independent of the interpupillary line.

Fig 1: Mounted bubble gauge on fox plane

Discussion

Several method for the determination of occlusal plane have been proposed. Conventional method have their inherent demerits. This modification is simple and inexpensive. It is very easy to use for the beginners. Need to be at eye level is eliminated and hence the chances of change in the angle of operator eye level leading to incorrect plane of occlusion are nil. This method is of advantage in cases with facial asymmetries and canted interpupillary lines. The practitioner would not need to imagine or try to present the interpupillary line with any instrument. Posture of the patient can bring about changes in the position of bubble. So the patient is made to sit erect looking straight ahead at horizon. When mounting the bubble gauge to the Fox plane, it should be done on a flat base as any inclination in surface can lead to incorrect mountings.

Conclusion

Arranging the teeth in the correct plane of occlusion is important for the success of complete denture prosthesis. This modification is thus reliable alternative
method for the orientation of the occlusal plane and can be used with less subjective bias than that of the conventional method utilizing the interpupillary line

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**References**