

Garstang Dental Referral Practice Open Evening 2021

Getting the teeth in the right place for complete dentures

The 6 secrets to carving the wax rim

Finlay Sutton – Handout

To be able prescribe the new tooth positions the wax rims must be retentive and stable. Excellent working impressions contribute to this. The working casts are poured with a land area to enable waxing of the rims to the same extension as the working impression – this increases their retention, stability and support.

Upper wax rim size

The wax rim is overbuilt to allow for trimming of the rim because it is easier to remove wax than add to it. The more resorption of the upper ridge the larger the rim needs since there will be more missing tissue (gum and tooth) to replace.

Class III - IV ridge: 7 mm forward of the incisal papillae
Labial flange – 11 mm high

Class VI - V ridge: 13mm forward of the incisal papillae
Labial flange – 20mm high

Procedure

The upper wax rim is tried in the mouth. If it has poor retention a post dam is added. I find this is necessary for most flat maxillae - Class V and VI.

Cutting the post dam

The working cast is soaked in water for 5 minutes to soften the cast. The fovea palatini are identified in the mouth and their positions are transferred with a pencil mark to the working cast. A pencil line is drawn on the working cast behind the right and left tuberosities crossing the palatal midline at the fovea palatini. A “cupids” bow design is drawn on the right and left side of the palatal midline with the apex extending 1 cm onto the soft area of the palate (over the soft connective tissue grafts areas). Using a Lecron carver the most distal line is carved out. This is approximately 1mm deep from the tuberosities towards the midline. The depth is reduced to approximately 0.5mm over the thin tissues of the palatal midline. In cases with a midline fissure the fissure is scored out, ensuring a posterior palatal seal. The posterior palatal wax of the upper record rim is warmed in the Bunsen burner. A posterior palatal seal is produced on the wax rim by reseating it on the working cast and using a thumb to push into the carved post dam.

Sometimes the patient cannot tolerate this extension as it makes them heave or feel sick. This will normally occur at the registration rim stage or denture try in stage. I explain to the patient that this normally resolves itself once the denture is finished and worn. Adaptation to the extension normally occurs. Occasionally though, this does not happen. In these cases I bring the posterior border forward by approximately 10mm at the midline keeping the extension around the tuberosities into the hamular notches. A post dam is added along this border to form a posterior seal.

The retention is often not quite as good as a fully extended posterior border, but it generally is sufficient for the patient to manage well with the new denture. It is particularly important that the other denture parameters are correct, such as sulci extension, tooth positions and the occlusion.

The purpose of the upper wax rim

The upper wax rim is carved so that the patient's facial appearance resembles the lip support of the patient when they were dentate. The clinician and nurse need to imagine what the patient would look like if they had their natural teeth. The wax rim is tried in the mouth. A photograph of the patient with their natural dentition is viewed on the screen during this process. Different photographs when smiling and with the lips together from various angles are used during the appointment. Wedding photographs are often best. The patient may sometimes be reluctant to search for them, but they must be encouraged to do their "homework". The resulting dentures not only look beautifully natural, they also function well because the denture teeth are more likely to be positioned in the neutral zone – zone of minimal conflict.

The recipe for shaping the upper wax rim

The following steps are performed – with the patient sitting upright with their head positioned in their everyday "social" position. The upper wax rim is placed in the patient's mouth. The dentist (clinician) and the dental nurse look at the patient from all angles and try to imagine the patient if they had their natural teeth. Adding the dental technician into the mix helps even more. The upper rim is trimmed step by step to achieve good aesthetics and future teeth positions. The following steps are performed in the following order. Mixing up the order will result in an incorrectly carved waxed rim.

1. Lip support. None smiling photographs from different angles are needed for this step. If these are not available imagination is required when using the dentate smiling photographs. At first, as the rim is overbuilt, the lip will be pushed out with too much lip support. The rim is then removed from the mouth, placed back onto the working cast and is trimmed on the labial aspect using a wax knife. The rim is reinserted, and the patient observed by the clinician and nurse again. This process is repeated until the lip support looks like the none smiling dentate photos – or looks like we would imagine the patient to look like if they had their natural teeth present.
2. Incisal plane – viewed from the front this is usually parallel with the inter-pupillary line, unless the patient had a cant and wants this to be incorporated into the final denture (for example with an asymmetrical smile). The rim (supported by the working cast) is trimmed using a heated wallpaper scrapper to the incisal plane of choice with reference to the smiling dentate picture. A Foxes bite plane is placed on the occlusal surface of the rim in the mouth and shows the incisal plane and occlusal plane out of the mouth. The upper lip grows in humans over time, but the incisal edge position does not change. As a result, there is less upper teeth display with age. The incisal edge of the rim is trimmed to take this into account. Generally, slightly less upper tooth show is prescribed compared to younger dentate photos which are often from many years previously, unless the patient specifically wants more tooth show. Note: the prosthetic incisal plane and posterior occlusal plane are not necessarily related, just as the front teeth and back teeth are best considered to be independent of each other. An example would be

creating Class II/div 2 dentures with a deep overbite; the upper incisal plane would be well below the posterior occlusal plane, and the lower incisal plane quite possibly above it.

3. From the side view the occlusal plane is carved parallel with the ala-tragal line (Camper's plane) as this is approximately parallel with the occlusal plane in fully dentate people. This gives the denture a good appearance. Trimming the wax rim like this often makes the tuberosity area thin and can result in a hole through the wax rim. This is not a problem as the final denture will have acrylic covering the tuberosities to form a seal. The occlusal plane of the trimmed rim is assessed with the Foxes bite plane placed on the occlusal surface of the rim and a ruler placed on the ala tragus. When the rim is correctly trimmed the ruler and the Foxes bite plane should be parallel.
4. The buccal corridors are created by carving back (using a wax knife) the buccal walls of the rim with reference to the dentate photographs supplied.
5. The centre line is scribed clearly on the rim with the wax knife. If there is centre line discrepancy on the supplied photos this is copied – unless the patient wishes for this to be changed.

Assessing the occluding vertical dimension (OVD)

This is a crucial determinant of the aesthetic result since changing the OVD considerably affects the appearance of the face. The aim is to create an OVD which would be the same as if patient were still fully dentate. Yet there are no universally accepted or completely accurate method of determining the vertical dimension of occlusion in edentulous patients and it is famously prone to error. This is where experience comes in helpful, as the OVD of the rims is adjusted until the face 'looks right'. This apparently 'fuzzy' suggestion is surprisingly effective. Humans have evolved to be very good at pattern recognition, especially of the human face. Even untrained people can frequently distinguish between a face with the jaw at rest or in the occluding position, a difference of maybe only 2 mm intraorally.

A variety of methods have been advocated to determine the OVD. Interested readers are referred to an excellent review article by Fayz and Eslami (Determination of occlusal vertical dimension: A literature review. *J Pros Dent* 1988;59(3):321-323.), which describes many of them. One point should be stressed, however, which is not always mentioned: when assessing the rest (postural) position it is important that the patient should be sitting upright *without* contacting the headrest of the dental chair. The headrest can easily falsify the rest position – too far back and the strap muscles of the neck will pull the mandible downwards; too far forwards and the opposite can happen. Neither will permit a true postural position.

The lower wax rim – pivot (Manchester block)

The lower wax pivot is trimmed to a satisfactory OVD using a wax knife. Once the OVD has been finalised, the occlusal recording in centric relation is finalised – either by fixing the rims together or more accurately using a central bearing point.

It is important that the whole dental team are involved in shaping the occlusal rims. The dental nurse (and dental technician if present) should collaborate and participate in this

process, but only by assisting the patient in deciding about the lip and face support and the speech, not by automatically confirming the clinician's opinion.