
Anterior teeth

10

VITA shade, VITA made.

VITA

10.1 Positioning of the anterior teeth

It can generally be assumed that in a normal occlusal situation the upper anteriors are situated at a distance of about 7 mm anteriorly of the incisal papilla (Fig. 1).

With a close bite the distance is about 6 mm and a protrusive bite about 9 mm.

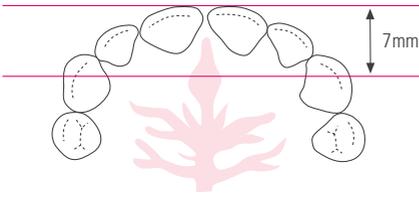


Fig. 1

The anterior teeth are positioned according to anatomical, functional, aesthetic, and phonetic requirements.

The following points should be heeded:

- The denture teeth should be incorporated in the wax rim in such a way that they continue the contour of the wax rim.
- Both mesial interdental surfaces of the upper central incisors and the mesial interdental surfaces of the lower central incisors should correspond to the midline markings on the model (Refer to diagram in section 5.2.)
- The midlines of the upper canines correspond to the position of the canine line markings on the model (Refer to diagram in section 5.2.)

- The length of the upper anteriors corresponds to the distance between the lip closure line and the smile line.
- The line connecting the tips of both upper canines runs through the centre of the incisal Papilla (CPC line).

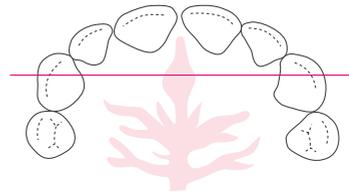


Fig. 2: CPC line (canine, papilla, canine).

10.1.1 Tooth length

The incisal edge of the maxillary central incisors should be approx., 0.5 – 1.00 mm longer than the lower edge of the upper lip, when the upper lip is passive (for men, 1.0 mm longer and for women, 2.0 mm longer).

These values concerning anterior tooth length are approximate and serve as a starting point. If followed, they will often deliver satisfactory results.

10.2 Setting the anterior teeth.

10.2.1 Standard setup methods

The anterior teeth, as explained following, can be set according to a standardised method. This is intended only as a guideline which can and should be modified to suit the individual patient case.

Upper

- The incisal edge of both upper central incisors are situated +/- 1 mm above the occlusal plane.
- The incisal edge of each lateral incisors is situated +/- 0.5 mm above the occlusal plane.
- The incisal edge of each incisor runs approximately parallel with the occlusal plane.
- The tips of both canines are positioned approximately at the level of the occlusal plane.
- The tips of both canines are situated at an approximate distance of 10 mm from the end of the first pair of palatal ridges (Fig. 3).

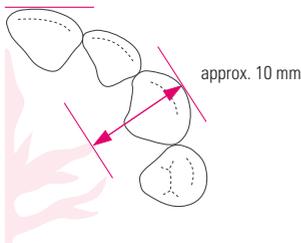


Fig. 3

Lower

- The incisal edge of each lower central incisor corresponds precisely to the contour of the occlusal plane.

- The incisal edge of each lower lateral incisor runs approximately parallel with the occlusal plane.
- The tips of both canines are positioned slightly above the occlusal plane.

The labial surfaces of the upper anteriors support the upper and lower lips (Fig. 4).

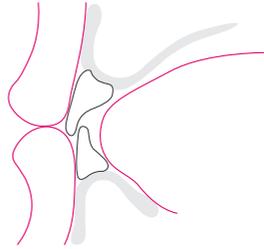


Fig. 4

A standard positioning of the upper anteriors is achieved as follows (Fig. 5 / labial view).

- The central incisors are straight and upright.
- The lateral incisors are inclined cervically and slightly laterally.
- The canines are more upright with the neck slightly towards the labial.

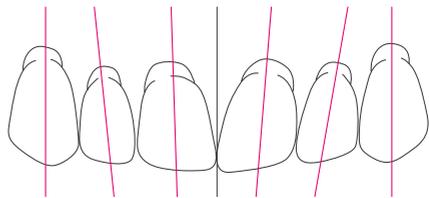


Fig. 5

- The central incisors and canines are parallel to the pupil line and correspond to the positive smile line in the arch.

A standard lower anterior setup viewed from the labial perspective is as follows (Fig. 6).

- The central incisors are straight and upright.
- The lateral incisors are slightly mesially inclined.
- The canines are also mesially inclined and the distal facet inclined in the direction of the molars.

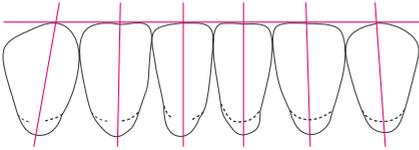


Fig. 6

Approximal inclinations:

- All anterior teeth are positioned with the body of the tooth on the centre of the alveola ridge.
- The central incisor is labially inclined.
- The lateral incisor is upright.
- The canine is lingually inclined.

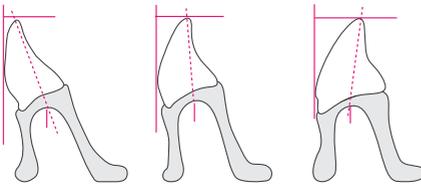


Fig. 7: Inclination of the central incisor, lateral incisor and canine.

At this point and as a general rule of thumb, the expression of, “on – at, -outside of” applies to the central and lateral incisors and canine. It concerns the position of the neck of

the tooth in relation to the alveola ridge and will generally produce an aesthetic setup. The lower canines have a slightly inward tilted position. It would be a disadvantage both functionally and aesthetically if the tips of the canines were positioned too far labially or the necks, too far towards the alveola ridge.

10.2.2 Individualised setups

Individualisation of the setup is best carried out at the try in. If for example the patients midline is off centre, the setup can be adjusted at the try in stage to avoid a lopsided appearance. Incisal edges can be harmonised with the nasal base line and individual teeth can be slightly rotated on their axis. These modifications to the setup can also be done in the absence of the patient but they are best completed and finalised at the try in stage with the agreement of the patient.

Examples of individual anterior setups



Fig. 8.1: VITA MFT T46 – the teeth are rotated slightly around their vertical axes, a labial view.



Fig. 8.2: ... and from an incisal viewpoint.



Fig. 9.1: VITA MFT S47 – the pronounced anterior positioning of the central incisors. The labial view ...



Fig. 9.2: ... and the incisal view shows this very nicely – note the slightly retruded lateral incisors.



Fig. 10.1: VITA MFT T46 – typical for class II/2, pronounced incisal retraction.



Fig. 10.2: The incisal view is a good example – the butterfly position of the central incisors in combination with the typical positioning of the lateral incisors.



Fig. 11.1: VITA MFT R42 – not too conspicuous in the labial view ...



Fig. 11.2: ... the slightly retruded central incisors and more conspicuously protruding lateral incisors.



Fig. 12.1: VITA MFT L37 – individual anterior positioning in the lower is a good aesthetic solution ...



Fig. 12.2: ... most clearly visible in the „broken arch“ form. Setups of this type are refined with correspondingly abraded facets caused by protrusive movements.



Fig. 13.1: VITA MFT L34 – Example of a moderately individualised setup.



Fig. 13.2: A rather even contour despite slight tooth rotation around the vertical axis.

10.2.3 Overbite – overjet

Overbite – sagittal (horizontal) overbite

An overbite is a vertical anterior overbite. This can have a dimension of up to 2 mm approx. The term overbite, refers to the sagittal anterior overbite, horizontally of up to 2 mm approx. As a general rule it is assumed that “overbite equals overjet” (Fig. 14).

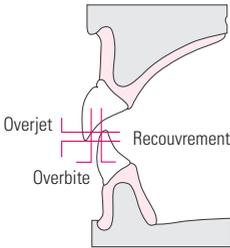


Fig. 14

This usually has a dimension of 1 mm which means that the overbite and overjet should correspond precisely if balancing of the mandibular movements is intended.

10.3 Phonetics

10.3.1 Problems and the appropriate solutions

To enable a complete denture patient to speak properly, consideration should be given to setting up in phonetic balance.

In order to be able to begin with the restoration of lost dentition, it is necessary to be aware of the function of the various oral segments (i.e.: tongue, palate, lips, etc. and their respective functions).

In this respect, nature itself shows the way. In nature, we can observe how the oral cavity is divided into sections in order to ensure faultless phonetics.

We also recognize the interconnection of dentition with speech and phonetic function. These develop during growth of the primary dentition and continue during development of the permanent dentition.

Once this speech / phonetic function has been learned during development, it is stored in the brain and will remain for life.

If the denture teeth are wrongly positioned, the patient will likely be able to reach only an approximation of their original speech pattern. However, every complete denture wearer develops phonetic tricks in order to overcome shortcomings and speak reasonably well.

If by comparison with the previously described example, the teeth are correctly positioned, the patient; even after wearing a denture with poor phonetics for 20 years, will regain phonetic function and revert to their original speech pattern.

How can this be achieved and how to correctly position the teeth in the first place?

It is necessary to explore the patient's, “stored phonetic speech pattern” and set the teeth phonetically (so to speak).

10.3.2 Generally accepted principles.

The oral cavity forms a resonating cavity which, depending on the position and orientation of the tongue, the teeth, the various muscles involved and the lips, convert an air stream into phonetic sound. The same occurs when a musician playing a trumpet or trombone, reduces the volume of the resonance chamber in order to produce higher notes or enlarges it to produce lower notes. The smaller the aperture through which the air passes the more the air stream accelerates and the larger the aperture, the slower the flow of the airstream.

The phonetic articulation is limited to two basic types.

- **Fricative consonants.**
i.e.: produce a rubbing sound.
Fricatives are consonants produced by forcing air through a restricted opening.
e.g.: the letters “f and v” are formed by the lower lip against the upper incisors.
- **Explosive consonants.**
The respiratory stream is interrupted at one of the four places of formation and immediately released.

There are two categories of explosives.

- Unvoiced explosives such as p, t, k.
- Voiced explosives such as b, d, g.

Beginning with the fricative. These are called labio dental consonants such as f, v and w.

The tongue plays a passive role in the formation of these sounds. They are formed by the anterior incisors contacting the lower lip at the wet dry line.

In order to form these sounds, the upper incisors must be in the correct position.

To form the “s” fricative, the tongue touches the posterior teeth and part of the upper anteriors. The tongue does not contact the middle of the upper anterior as this channel remains open for the airstream. The tip of the tongue is generally in contact with the lower anteriors when forming the “s” sound.

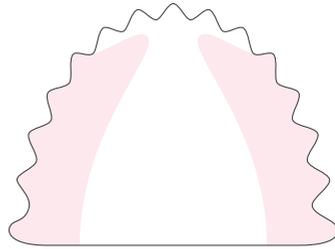


Fig. 15: Contact areas of the tongue when pronouncing the „s” sound.

In order to form these sounds, the lower incisors must be correctly positioned.

If they are situated too far lingually, the “s” sound will be distorted and become similar to the “th” sound of the English language. If the lower anteriors are positioned too far labially, the “s” sound will bear more resemblance to the “sh” sound.

In order to produce the “sh” fricatives, the tongue is supported in the palatal, dental and alveola directions.

The tongue presses against the palate and in this way controls the air stream.

In order to form these sounds, the patient requires tongue support from the oral structures in the palatal area.

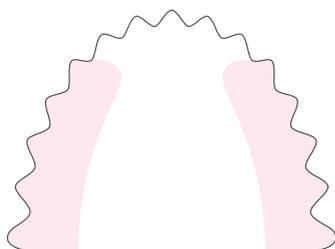


Fig. 16: Contact areas of the tongue when pronouncing the „sh“ sound.

Failing this, the patient can only improvise these sounds with difficulty by shifting the location of articulation posteriorly. The result will then be an approximation, similar to the Scottish pronunciation of the word, „loch.“

Explosive consonants p, t, k, b, d, g are formed when the air stream is sealed off anteriorly by the tongue, lips, or other parts of the mouth and then rapidly released.

The correct positioning of the upper incisors is essential for the formation of the consonants t and d and in the case of consonants k and g, the positioning of the posteriors and corresponding palatal support is important. Consonants b and p are formed purely labially.

Description of facial/oral positions and movements in formation of consonants m, b and p.

What can we see?

- When pronouncing „m“, complete lip closure can be observed.
- In the case of b, the lips are released slightly.
- With P, the lips move apart rapidly and the cheeks swell slightly.
- The chin does not move when m, is pronounced.

- The chin moves slightly downwards when b is pronounced.
- The chin shows a sudden downwards movement when p is formed.

What we cannot see

- The teeth have only a slight inter-occlusal separation (freeway space).
- The tip of the tongue lies on the lower incisors.
- The underside of the tongue lies flat as during the formation of the „a“ sound.

Classification according to place of articulation:

- **Labial (Latin: labium = lip)**
p, b, m, f, v, ph, w, pf
The lips form a more rounded-elongated aperture.
- **Dental (Latin: dens = tooth):**
sh, t, d, tz, s, z, n
The upper incisors articulate against the inner edge of the lower lip. The tip of the tongue articulates against the inner edge of the upper incisors.
- **Palatal (Latin: palatum = palate)**
n, l, „ch“ as in „chew“
The Palatal consonants result when the tip of the tongue articulates against the anterior palate.
- **Velar (Latin: velum = sail):**
k, g, ng, nk, q, ch, j, or ch as in the Scottish pronunciation of „loch.“
The place of articulation is between the posterior portion of the tongue and the soft palate.

