Dental surveyor

It is an instrument used to determine the relative parallelism of two or more surfaces of the teeth or other parts of the cast of a dental arch.

DESCRIPTION OF DENTAL SURVEYOR

The most widely used surveyors are the Ney and the Jelenko.

The major difference between them is the horizontal arm in the Nye type is fix while in the Jelenko is movable.

Parts of the surveyor

1- Platform on which the base is moved.
2- Vertical arm that supports superstructure.
3- Horizontal arm from which surveying tool suspends.
4- Surveying arm : it is carries the mandrel.
5- Locking device
6- Surveying instruments.
7- Mandrel for holding special tools.

The tools which are used for surveying are:

A- Analyzing rod
It is a rigid metal rod used for diagnostic purposes in the
selection of the path of placement and to determine the undercut areas prior to scribing the height of contour with the carbon marker.

B- Carbon marker
it is used for the actual marking of the survey line on the cast. A metal shield is used to protect it from breakage.

C- Undercut gauge
they are used to measure the extent of the undercut on abutment teeth that are being used for clasp retention.

D- Wax trimmer
it is used to trim excess wax that may be inserted into those undercut area which are to be obliterated to obtain the proper form of the wax pattern.

OBJECTIVES OF SURVEYING
1- To determine the most desirable path of placement that will eliminate or minimize interference to placement and removal.
2- To identify proximal tooth surfaces those are made parallel
to act as guiding planes during placement and removal.
3- To locate and measure areas of the teeth that may be used for retention.
4- To determine whether tooth and bony areas of interference will need to be eliminated surgically or by selecting a different path of placement.
5- To determine the most suitable path of placement that will permit locating retainers and artificial teeth to the best esthetic advantage.
6- To permit an accurate charting of the mouth preparation to be made.
7- To delineate the height of contour on abutment teeth and to locate areas of undesirable tooth undercuts, to be avoided, eliminated, or blocked out.
8- To record the cast position in relation to the selected path of placement for future reference.

The effect of tilting a cast on the surveyor will be:
1- Redistribution of undercuts to the desired areas.
2- Allow more favorable path of insertion.
3- Allow the use of a desired type of clasp for better function and esthetic.
4- Allow the use of a design to minimize food impaction, food entrapment and plaque accumulation.

RULES OF SURVEYING
1- The undercut areas cannot be created or produced by tilting the cast.
2- All casts are originally surveyed with the occlusal plane is parallel to the base of surveyor; this is what we called zero tilt.
Most patients will tend to seat the partial denture under force of occlusion. If the path of insertion is other than vertical to the occlusal plane such seating may deform the clasps.

3- The retentive tip of the clasp must engage the undercut area, which are present when the cast is surveyed in certain position.

4- Wherever possible, the undesirable undercut and area of interference are removed during mouth preparation by recontouring teeth or making necessary restoration.

5- Anteroposterior tilt: anterior tilt will increase the mesial undercut, while the posterior tilt will increase the distal undercut. Such as in free end extension partial denture. Tilting the cast anteriorly will decrease or eliminate the distal undercut where the path of insertion will be changed, thus getting rid of undesirable undercut located distally, therefore the tilting of the cast is to minimize or equalize the undesirable undercut.

6- Lateral tilt: dealing with retentive undercut situated buccally or lingually on posterior teeth.

NOTE
A partial denture should have a single path of insertion, this is only possible for dentures with bounded saddle, for dentures with free end saddles two or more paths of insertion will be possible.
Types of undercuts established by surveyor
1- Contour: due to natural contour of the tooth.
2- Positional: due to tilting of cast on surveyor.
3- Desirable undercut: used for retaining the removable partial denture against the dislodging forces by incorporating retentive flexible clasp arm.
4- Undesirable undercut: undercuts other than those used for retention are considered undesirable.

The undesirable undercut can be avoided by

A- Tooth recontouring.
B- Placing properly contoured crown restoration on the tooth.
C- Tilting the cast and change the path of insertion.
D- Blocking out the undercut with wax on the master cast.