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Posterior Teeth Selection

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Abstract
Dental esthetics and the beauty of the smile are of main importance in today's civilization. The edentulous patient is no exception, yet creating a natural-appearing smile for this patient is very hard to achieve. This article discuss about selection and various types of posterior teeth.

Keywords - *Teeth, Posterior teeth*

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I. Introduction

Teeth selection is not simple a mechanical procedure, but requires skill and understanding. Selection of teeth forms a main step before teeth arrangement[1]. In the mid-1920s, dentists started trial with tooth forms that were designed for anexactuseful purpose rather than justcopying natural forms. Thus developed a number of nonanatomical denture teeth. The occlusal surfaces of these teeth are not duplicated from the natural form but are given form from the tooth carver intended to meet exact patient needs, such as denture base stability and improvements in mastication. Some nonanatomical posterior denture teeth were designed completely without cusp, whereas other were mechanical in design, having metal cutters to increase masticatory efficacy.[3]

II. History Of Posterior Teeth Form

Anatomic teeth

Gysi in 1914 designed the Trubyte teeth. These were the first anatomic posterior teeth to be developed. They were made of porcelain and resembled natural teeth with transverse ridges intended for tight interdigitation. Crossbite situations were difficult to treat with these teeth[3].

Modified anatomic teeth

In 1927 Gysi designed Gysi crossbite teeth. Maxillary buccal cusp was eliminated. Palatal cusp occluded with anatomic lower posterior. Occlusal surfaces of all posterior teeth were reduced and these were used for crossbite cases[3].

In 1927 sears designed channel tooth. In this the maxillary occlusal surfaces had a deep channel running mesiodistally along all four posterior teeth. Lower posteriors were like a single ridge, half the buccolingual width of the normal anatomic teeth,which articulated with upper channel. They permitted unlimited protrusive glide[3].

In 1930 Avery brothers designed the Scissor bite teeth. In this design, the posterior occlusal surfaces were ground – like steps with the angle determined by condylar guidance. There was freedom in lateral excursion[3].

In 1932 Pilkington and Turner designed a tooth which resembled natural occlusal forms but had angle of 30°. Provided a small degree of freedom in protrusive and excursions, but were interlocked in lateral excursions[3].

In 1935 French introduced Modified posteriors. In this designed, the upper posterior teeth were similar to ‘channel teeth’ but with shallow buccolingual inclines. Lower teeth had a sloping buccal surfaces that was placed below the occlusion. Only the lingual cusp contacted the grove in the upper. This was claimed to direct the forces lingually stabilizing the lower denture[3].

In 1937 Max Pleasure designed the Pleasure scheme. In this designed the lower posterior occlusal surfaces were modified to produce a reverse curve by tilting the tooth buccally. This was also claimed to stabilize the lower denture by directing the forces lingually[3].

In 1942 John Vincent designed the Metal insert in resin. In this designed, circles of gold solder wire or stainless steel wire were inserted in the maxillary posterior resin occlusal surfaces. They were set opposing French’s mandibular posterior. It was claimed that as the resin wore, the chewing force was concentrated in centre of the denture[3].

In 1961 Sosin designed Crossblades. In this designed the occlusal surface of the upper second premolar and first and second molars were covered with vitallium. During try-in, the lower posteriors were removed and

denture is processed. During insertion of denture, wax was placed on the lower permanent record base and the patient was asked to produce chewing movements. The lower occlusal pattern was converted to gold and processed onto lower denture[3].

In 1977, Levin modified these teeth by placing the vitallium only on the maxillary palatal cusps for esthetic reasons[3].

Non – anatomic teeth

In 1929 Hall designed the Inverted cusp tooth. This was the first non - anatomic designs. The occlusal surface of the teeth was flat with sharp concentric ridges around cup – like depression (inverted cusp). Efficient mastication was claimed with this type[3].

In 1929 Myerson designed True – cusp teeth. This was also a cusp-less posterior that had a series of buccal-lingual ridges[3].

In 1934 Nelson designed the Chopping block teeth. This is flat occlusal surface with ridges. Mandibular ridges were placed transversely, while maxillary ridges were placed mesiodistally. The perpendicular contact made by the ridges was claimed to have an efficient shredding and mechanism[3].

In 1939 Swenson designed the Non-Lock teeth. Flat occlusal surface with sluiceways for shredding and allowing food to escape from the occlusal table. They also provide some balancing contact as mild buccal and lingual incline was provided[3].

In 1946 Hardy designed Vitallium occlusal 'VO'. These were non-anatomic teeth, which contained metal inserts in occlusal surface. The two premolars and first molar were joined together but with separation evident buccally. Vitallium ribbon was embedded on occlusal surface in a zigzag manner, slightly raised from the resin surface. The contact of the upper and lower teeth was on this metal ribbon and this improved the cutting efficiency[3].

In 1951 Myerson Tooth Coperation designed Shear-cusp tooth. These were the first crosslinked acrylic non-anatomic teeth to be developed. These crosslinked resin teeth were documented to be at least 30% more wear resistant than normal acrylics[3].

In 1952 Cook designed Coe masticators. In this designed the mandibular premolar and first molar were flat stainless steel castings with diagonal holes on the occlusal surface that slopes buccally. These occlude with the flat upper porcelain teeth to grind the food[3].

In 1957 Bader designed Cutter-bars. Here the cobalt- chromium metal cutting bar was placed on the occlusal surface of the lower posteriors – second premolar, first and second molar. They opposed flat upper porcelain teeth[3].

In 1967 Frush designed Linear occlusal concept. In this concept the single mesiodistal ridge was placed on the lower posterior teeth opposing flat upper teeth[3].

SELECTION OF POSTERIOR TEETH

The cuspal inclines for posterior teeth depend on the plan / scheme of occlusion selected by the dentist. Commonly used posterior cuspal inclinations are 33°, 20° and 0°. The inclination is measured as the angle formed by the mesiobuccal cusp of lower molar with the horizontal.[2,5]

FACTORS FOR SELECTING POSTERIOR TEETH

1. Size of the teeth
2. Form of the teeth

Size of the teeth

Factors for selecting the size of the teeth

1. Buccolingual width of posterior teeth
2. Mesiodistal length of posterior teeth
3. Occlusogingival (vertical) height of the facial surfaces of posterior teeth

Buccolingual width of the posterior teeth –

a. The buccolingual width should be adequate to act as a table to hold food during trituration, to support cheeks and tongue and functional in harmony with the musculature during swallowing, speaking and mastication.
b. The buccolingual widths of artificial teeth should be less than the widths of the natural teeth they replace. But it should not be reduced such that support for cheeks is lost. It should also not be so large that it encroaches on tongue space and buccal corridor.
c. Artificial posterior teeth that are narrow enhance the development of the correct form of the polished surface of the denture by allowing the buccal and lingual denture flanges to slope away from their occlusal surfaces. This also permits forces the cheeks and tongue to stabilize the denture.
d. When the lower ridge is strong, well form and covered by the adequate thickness of attached masticatory mucosa, the entire buccolingual space available can be used to place the artificial teeth as the ridge has the capacity to tolerate the forces of the mastication.

e. When the ridge is weak, resorbed and covered only by thin lining mucosa, the size should be smaller. This will limit the forces directed to the ridge[1, 2]

Mesiodistal length of posterior teeth -

a. The length of the mandibular residual ridge from the distal to the canine to the retromolar pad will dictate the dimensions of the posterior teeth selected.
b. Artificial posterior teeth are manufactured with varying widths and length that easily accommodate the needs of the patients.
c. This is determined by the edentulous space available from the distal of the mandibular cuspids to the beginning of ascending area of mandible.
d. The ascending area is inclined and placing teeth here would direct forces at an inclined plane rather at right angles to support, which will cause the lower denture to slide forward.
e. Maxillary posterior teeth that extend too close to the posterior border of the maxillary denture may cause the patient to bite cheek.[2, 5]

Occlusogingival height (vertical) of the facial surfaces of the posterior teeth -

a. Posterior teeth should be selected corresponding to the interarch space and to the height of the anterior teeth.
b. Artificial posterior teeth are manufactured in varying occluso- cervical heights.
c. The height of the maxillary first premolar should be comparable with that of the maxillary of the maxillary canines to have that the proper esthetic effect.
d. Without this relationship, the denture base material will appear unnatural distal to the canines.
e. Ridge lapping the posterior teeth can be done without sacrificing leverage or esthetics[6].

Form of the teeth

Artificial posterior teeth are available in two forms –

1. Anatomic teeth
2. Non anatomic teeth

Anatomic teeth

Also called as 'cusp teeth'. It is designed to stimulate the occlusal surface of the natural tooth. Available in varying degree of inclinations – the standard is approximately 33°. The angle can be modified by grinding or purchased in a modified anatomic form. When the cusp incline is less than the conventional 33°, it is termed as modified anatomic or semi anatomic teeth[6]

Non- anatomic teeth

They are also called the 'cuspless', 'monoplane' or 'zero degree' teeth. The occlusal surface is essentially flat and has no cusp heights[6].

III. Conclusion

The dentist must perform this selection process because he or she is the only person who can gather, compare and evaluate the biomechanical information so that the artificial teeth will meet the specificrequirements of the patient.

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