

SHORTENED DENTAL ARCH- ITS EFFECT ON MASTICATION

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ABSTRACT

A shortened dental arch is defined as a dentition where the most posterior teeth are missing. This condition is frequently seen as molars are often lost by caries and periodontal disease as a result of which their chewing platform area is reduced. It has been well established that chewing performance as measured by chewing tests, declines linearly with decrease of chewing platform area. It can therefore be anticipated that the reduction in the number of posterior teeth as in SDAs will lead to difficulties with chewing. However a number of studies indicate that majority of the people with a reduced number of posterior teeth report their chewing ability to be satisfactory as long as 20 well distributed teeth are present. In case of SDA this was observed with at least 3-4 occluding pairs of teeth are present, preferably in a symmetrical position.

KEYWORDS: Shortened dental arch; mastication;

INTRODUCTION

The more traditional view of restorative dentistry concerns the necessity of a complete morphological repair. Since this approach has its limitations towards the high risk groups in the community, a different way of planning in dental care has been proposed. Its main characteristic is functional repair, a problem oriented approach in which it is considered sufficient to restore or replace only the strategic part of the dental arch. This study deals with the question whether a shortened dental arch without molars can meet the masticatory function in general. The teeth specially adapted for chewing, the molars, are often lost relatively early in the course of life. The question is whether they have to be replaced in

every case to fulfil the minimum demands. The perception of the consistency of the food during chewing may be changed as a result of the reduction of the masticatory function. The subject may compensate the consequences of the absence of molars by chewing longer or by swallowing less well-chewed food. Also the subject may develop a preference for soft and easy to chew food. Besides the risk of a one-sided diet such food may be harmful to dental health. The aim of the study is to find answers to the following questions:

- i. Do subjects with a shortened dental arch (SDA) have a higher risk of getting chewing problems?
- ii. Do subjects with a SDA have to adapt their chewing habits?
- iii. Do subjects with a SDA show a difference in food perception, food selection and change their diet?

MATERIAL AND METHOD

The investigated subjects consisted of a control group having a complete set of natural teeth and a group in which the molars were missing, the SDA group. To increase the number of the SDA group, also subjects with a tooth-unit more or less were included. All the subjects were selected from the patients who came to MR Ambedkar dental college, Bangalore.

The criteria for selection were:

- i. Age (between 21 and 50 years);
- ii. Oral health (the teeth and periodontal tissues had to be in a healthy condition, only in the SDA group the molars, and some premolars were missing);
- iii. Restorative treatment (subjects with extensive restorative treatment and prosthesis were excluded).

After matching on age, sex, health and diet the

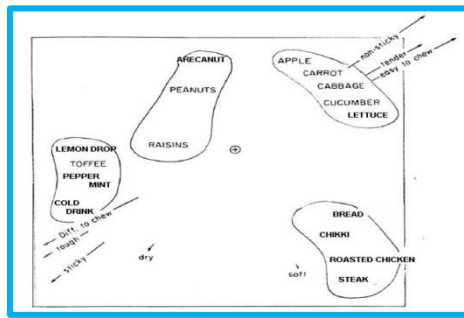


Fig. 1

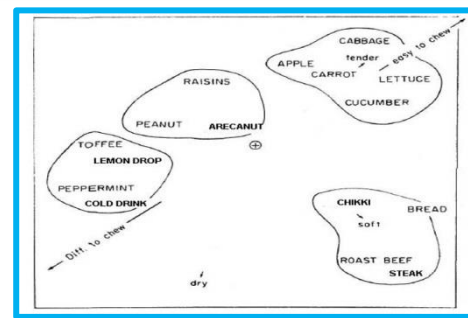


Fig. 2

Control Group				SDA Group		
Age	Female	Male	Total	Female	Male	Total
20-40	26	30	56	18	18	36
35-45	8	7	15	15	12	27
Total	34	37	71	33	30	63

total number of subjects was one thirty four: seventy one subjects with a complete dentition and sixty three subjects with SDA. The data were collected by interview. The interview consisted of questions about socio-structural background characteristics, some aspects of certain foods and the masticatory function of the subject. The investigated aspects are: the subjects' determination of the similarities of sixteen food products, the judgements of texture properties of these foods, preference for the foods and the frequency with which the subject actually consumed the foods. The sixteen foods were aricanut, apple, peppermint, chikki, cold drink, steak, lime drops, raw carrot, peanut, lettuce, roast chicken, raisins, toffee, cabbage, bread and cucumber. The analysed background characteristics referred to were: civil status, situation of the respondent in the family, presence of a denture wearer in the family, which member of the family prepared the food, and type of health insurance. It was concluded that in a socio-structural view both groups of subjects may be considered as equal.

RESULTS

A check was made to find out if there were differences in texture judgements, preferences and actual consumption of sixteen foods between the SDA and control groups. On the whole no significant differences were found. The similarity and texture judgements were investigated by means of the multidimensional scale analysis. No differences were found between both groups. Based on the similarity judgements the foods can

be clustered in groups of different function. For the subjects with SDA the dimension on which the judgements appeared to be made was the ease of chewing. For the control groups the dimensions were toughness, stickiness as well as ease of chewing (Fig. 1 & Fig. 2). Finally, the masticatory function of the subject concerned was analysed. The answers in the interviews indicate that in the group of the younger subjects those with SDA could be expected to have more chewing problems. Eight of subjects with SDA (19%) often had chewing difficulty, they had to chew for a longer time than before losing their molars and some of them (7%) had to change food preparation as a consequence.

DISCUSSION

The reliability of multidimensional scale analysis is confirmed by the resemblance with the results of Green & Rao (1972). As to the results of the chewing function, it seems to be in contradiction with those from Wayler & Chauncey (1983). They found that subjects with an incomplete dentition had a lower perceived ease of chewing than subjects with a complete dentition in relation to the thirteen tested foods. They described their incomplete dentition group as compromised, meaning ten to thirteen teeth bilaterally (twenty to twenty-six). They gave no information about the number of antagonistic pairs and their location. This may be of importance and could explain their results. Lost molars resulting in incomplete dental arches with tooth bounded spaces give more chewing discomfort than missing molars resulting in SDA (Kayser, 1981). In the study of

Kayser (1981) 21% of the subjects appeared to have chewing problems, which is comparable to the results of this study.

CONCLUSION

In view of the results of this investigation it may be stated that for subjects with a shortened dental arch the chewing function, the food perception, the food choice and the actual food consumption are hindered but in an acceptable way.

CONFLICT OF INTEREST & SOURCE OF FUNDING

The author declares that there is no source of funding and there is no conflict of interest among all authors.

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