

Risk for molars without antagonists: Opinion of dental practitioners in Tanzania
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Abstract

Aim: To investigate the opinion of dental practitioners in Tanzania with regard to the risk for molars without antagonists. **Subjects and methods:** A questionnaire was distributed to all 85 dental practitioners in three administrative regions in Tanzania. The questionnaire contained items to assess the opinion of the practitioners with regard to consequences of unopposed molars, patients' complaints about molars without antagonists and the routine treatment (or no treatment) to patients with such dentitions. **Results:** The great majority of practitioners (92%) believed that unopposed molars overerupt markedly and majority (87%) recommends replacement of the missing antagonist with partial dentures while 13% preferred to wait and see. The main reasons for the suggested treatment were (1) to prevent overeruption of unopposed teeth (90%), (2) to prevent impairment of chewing function (92%) and to prevent development of Temporomandibular Disorders (68%). However, only three practitioners (5%) indicated complaints of patients due to unopposed posterior teeth. **Conclusion:** Despite the limitations of the sample, the data suggests that Tanzanian dental practitioners perceive that molars without antagonists overerupt markedly and that they are a risk for impaired chewing function and Temporomandibular Disorders.

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Introduction

It is widely accepted that permanent teeth without antagonist overerupt, creating after some time, considerable problems, which negatively affect the health of the stomatognathic system (1-3). The adverse consequences of overeruption, according to many textbooks, include occlusal interference, Temporomandibular Disorders (TMD) and impairment of chewing function (1-4). To avoid these problems, dentists have been taught to replace the missing antagonists with fixed or removable partial dentures. Although this viewpoint has been in the dental education for long, it is mainly based on expert opinion without unequivocal scientific evidence.

To date, data about the consequences of unopposed posterior teeth are scarce and inconclusive. On the one hand a study on casts of subjects whose molars were without antagonists for five to fifteen years reported that all unopposed teeth moved beyond the occlusal plane (5). On the other hand, clinical observations have revealed certain patients who have had unopposed posterior teeth for many years with little or no clinically relevant overeruption (6, 7). Furthermore, a great majority of subjects with a substantial overeruption of unopposed posterior teeth indicated that this situation did not affect their oral function (8).

In Tanzania extraction is the most prevalent mode of dental treatment, and molars are the most commonly extracted teeth (9). It can therefore be expected that many people will have unopposed teeth in the posterior region of the dentition. This study was carried out to investigate the opinion of dental practitioners in Tanzania with regard to risk for molars without antagonists. The data will be useful for planning continuing education in occlusal reconstruction (10) and also as a basis for further research on the consequence of unopposed posterior teeth.

Subjects and methods

The study was conducted in three administrative regions in Tanzania: Dar es Salaam, Tanga and Coast. These regions were selected because of their proximity to the dental school in Dar es Salaam and a relatively large number of dental practitioners: graduate dentists, assistant dental officers and dental therapists.

A modified questionnaire used previously in Sweden (11) was distributed to all 85 dental practitioners in the three regions. A letter explaining the aims of the study accompanied the questionnaire. The first part of the questionnaire contained items about demography and professional characteristics (qualification, years of experience, and location of dental practice) of the practitioner. Two other items were used to

describe the specific problems of patients with unopposed molars and the type of treatment the practitioner ordinarily recommend to these patients.

In the second part of the questionnaire a hypothetical clinical situation of a middle aged man who last week lost two mandibular molars (teeth 36 and 37) because of caries was presented (Fig 1). The last molars (teeth 28 and 38) were extracted long ago because they were impacted. The practitioners were then asked to state which of the following would happen to unopposed maxillary molars within a 10-year period: (1) No or small changes (movement of 0-1mm beyond occlusal plane) (2) marked overeruption (movement of > 1 mm beyond the occlusal plane) (3) Don't know (4) Other changes. Next, the practitioners were asked to explain the treatment they ordinarily recommend to patients with such a clinical situation. The alternatives to be considered were: (1) to perform prosthodontic treatment to eliminate the edentulous mandibular area, and if so: (a) as soon as possible (b) within one year (c) within 5 years (2) to wait and see (3) to do nothing (4) not knowing what to suggest to the patient. Lastly the practitioners were asked to mention the indications for the treatment chosen in the treatment plan by marking yes or no for one or more of the following alternatives: (1) risk for overeruption (2) risk for development of periodontal lesions (3) risk for development of dental caries (4) risk for Temporomandibular Disorders (TMD) (5) risk for impaired masticatory function (6) risk for development of aesthetic problems. The dentists were informed that the study is anonymous and the data would be analyzed collectively. Percentage distributions are given in tables and frequency distribution are shown. Comparison of proportions was done by using Chi-square test.

Results

Overall 62 out of the dental practitioners responded. One questionnaire was excluded from the analyses because it was inadequately filled-in. The response rate was therefore 72%. Of those who responded appropriately, 21 (36%) were graduate dentists, 16 (25%) assistant dental officers and 24 (39%) dental therapists. The gender distribution was 45 (74%) males and 16 (26%) females. Eighteen (29%) practitioners had a working experience of ≤ 5 years, 20 (33%) practitioners had worked for 6-10 years, and 23 (38%) had an experience of more than 10 years.

Twenty four practitioners (39%) work only in governmental hospitals, 26 (42%) work in governmental hospitals and in private dental clinics while 11 (18%) work exclusively in private dental clinics.

All practitioners indicated they treat patients with unopposed molars who mostly constitute 5-10% of all patients (Table 1). Concerning patient's complaints, 58 (95%) practitioners indicated that the patients did not complain about unopposed molars while 3 (5%) practitioners indicated patient's complaints: esthetic problems (1 practitioner), difficulties with chewing (2 practitioners), Temporomandibular disorders (2 practitioners), and risk of overeruption (3 practitioners).

Table 1. Proportion of patients with unopposed molars

Proportion of patients	Practitioners	
	n	%
> 0 and < 5%	12	20
≥ 5 and < 10%	42	69
≥ 10 and < 20%	5	8
$\geq 20\%$	2	3
Total	61	100

In the assessment of the hypothetical clinical situation (Fig. 1), a great majority (92%) of the practitioners believed that, after ten years, the unopposed maxillary molars would overerupt markedly, 7% suggested none or minor changes, and 2% don't know.

Concerning management of the hypothetical patient in an actual clinical situation, 53 practitioners (87%) recommended replacement of the missing antagonists whereas eight practitioners (13%) preferred to "wait and see" before starting any treatment. Of the former group, 41 practitioners recommended a removable partial denture while 11 practitioners preferred a fixed bridge for replacing the missing antagonists. Forty-one practitioners (77%) indicated that the missing antagonists should be replaced as soon as possible, 11 (21%) within one year and 1 (2%) within 5 years. The indications for the suggested treatment included the risk for over-eruption of unopposed teeth (90%), impaired masticatory function (92%), and temporomandibular disorders (TMD) (62%) (Table 2).

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Table 2. Indications for treatment of patients with unopposed molars

Indication for treatment	Practitioners	
	n	%
Over eruption	55	90
Impaired chewing function	56	92
Temporomandibular Disorders	38	62
Risk for caries	19	31
Risk for periodontal diseases	30	49
Aesthetics	22	36

The differences in responses to the questionnaire between the subgroups of gender, qualification and location of practice were generally small and statistically non significant. The only significant difference was found in the practitioner's suggestion for treatment of the hypothetical patient where 36% of the younger practitioners (with up to 5 years of working experience) preferred to wait and see, in comparison to 9% of the older practitioners (Chi square = 13.5; DF = 2 $p = 0.002$).

Discussion

The findings of this study should be interpreted with caution. By limiting the sample to three administrative regions, a true representation of all (225) dental practitioners in Tanzania is not obtained. However 38% of the dental practitioners in Tanzania are employed in the three administrative regions, and there is no clue that the practitioners in the study regions differ substantially from the practitioners in other administrative regions. Therefore, although not truly representative, the sample provides an overview of perception of risk for unopposed molars among dental practitioners in Tanzania. Additionally, the response rate of 72% is acceptable in epidemiological surveys (12).

Although patients do not complain about unopposed molars, majority of the practitioners indicated they ordinarily recommend immediate replacement of the missing antagonists with partial dentures. Perhaps this contradiction is a result of adherence to traditional concepts of occlusion by most practitioners. These concepts are based on morphologically oriented criteria which emphasizes routine replacement of all absent teeth. However, research data has shown that the compulsion to replace all missing teeth has limitations to individual patients and to the health care system, and it may lead to overtreatment (13, 14). Superimposed on this is

the fact that removable dentures have a biological price. Drawing from clinical observation, Ramfjord (15) stated that "replacement of lost molars is a common source of iatrogenic periodontal diseases, and should be avoided if requirements to aesthetics and functional stability can be satisfied without such replacements". Removable partial dentures precipitate the occurrence of dental caries unless strict precautions are followed (16, 17, 18). Non-tooth supported acrylic removable partial denture is even more contraindicated since this type of appliance does not stabilize the occlusion at all (19, 20).

Regarding the hypothetical clinical situation nearly all practitioners believed that the unopposed teeth would overerupt markedly in a period of ten years. This finding is in agreement with a recent study in Tanzania which reported substantial overeruption of unopposed posterior teeth in subjects with shortened dental arches (8). However, that study also reported that, for most individuals, the overerupted teeth do not hinder oral function. Therefore, overeruption alone would not be a plausible indication for prosthetic therapy.

Chewing performance as measured with laboratory chewing tests declines linearly with a decrease of chewing platform area (number of posterior teeth) (21-25). Therefore it is not surprising that, in this study, the risk for impaired chewing function was the most common reason for replacing the missing antagonist molars. However, clinical observations as well as research findings have shown that there is sufficient adaptive capacity to maintain satisfactory chewing ability when a dentition has intact premolar regions and at least one pair of occluding molars (21, 26, 27). Similarly, Aukes (28) found only small differences in chewing ability between subjects with reduced number of posterior teeth and subjects with complete dental arches. Impaired chewing ability occurs only in severe reduction of chewing platform area, remaining only 2-3 occluding posterior teeth.

As revealed in this study, the risk for development of TMD in patients with reduced molar support has been a common belief among dental practitioners. The underlying assumption relating to this belief is that a reduced posterior support will lead to mandibular overclosure,

changes in position of condyles, and increased load in the joints (29, 30). Therefore replacement of missing posterior teeth was considered necessary in order to prevent bite collapse, to support temporomandibular joints and consequently prevent TMD. However, it is now realized that as a generalization, molar support is of little importance in the etiology of TMD (31). In a review paper Seligman & Pullinger (32) concluded that the association between loss of posterior support and TMD was minimal or absent when the effects of age are controlled for. Therefore replacement of the missing molars solely to prevent TMD can not be a general principal in the treatment planning.

Practitioners with a shorter working experience (up to five years) more often preferred to "wait-and-see" before commencing treatment than did practitioners with longer durations of practice. Perhaps the practitioners who graduated recently are aware of modern concepts of occlusion and the contemporary treatment philosophies in dentistry. These concepts are relatively new and were not taught in dental schools previously. In Tanzania, acquisition of new developments in dentistry is limited by shortage of contemporary dental literature and continuing education sessions.

From this study it is concluded that dental practitioners in Tanzania perceive that molars without antagonist will over erupt markedly over a time, and they are a risk for impaired chewing function and Temporomandibular Disorders (TMD). Since this opinion does not correlate to the contemporary occlusal concepts further investigations are required to explore the consequences of unopposed posterior teeth in subjects with such dentitions in Tanzania.

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A guy goes to girl's house for the first time, and she shows him into the living room. She excuses herself to go to the kitchen to make them a few drinks, and as he's standing there alone, he notices a cute little vase on the mantel. He picks it up, and as he's looking at it, she walks back in. He says, "What's this?" She says, "Oh, my father's ashes are in there." He goes, "Jeez...oooh...I..." She says, "Yeah, he's too lazy to go to the kitchen to get an ashtray."