

THE MOST COMMON REASONS FOR TOOTH EXTRACTION IN ORTHODONTICS

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ABSTRACT

Tooth extraction as part of orthodontic treatment is a frequent intervention in orthodontic clinical practice. There are several reasons why it is necessary to extract teeth in orthodontic purposes: tooth mass - arch length discrepancy (severe crowding), bimaxillary dentoalveolar protrusion, skeletal disharmony and camouflage treatment, pathological conditions, structural and developmental anomaly of teeth. The indication for tooth extraction is based on strictly established diagnostic protocol.

The aim of this study was to determine the prevalence of certain indications for tooth extraction in the Department of Orthodontics, Faculty of Dentistry with Clinics in Sarajevo.

Key words: orthodontics, indications, extraction.

Introduction

Tooth extraction, as a part of the orthodontic treatment, is still controversial topic seeming to remain so for long time. At the period when orthodontics, as a part of the dental profession and science, is still developing, E.H Angle was the authority strong enough to enforce attitude of non extraction approach to orthodontics. He believed possible to correctly position all of 32 teeth in the dental arches and, as a result, the adjacent tissues (bone and muscle) would adapt to this new position. On the basis of this belief, he taught his students and treated numerous cases [1]. Unfortunately, it becomes clear that it is impossible to achieve an acceptable result of treatment and long-term stability in some cases, without extraction [2].

There are some very real reasons that today's orthodontists still recommend the extraction of teeth. The truth is, many orthodontists start treatment without extraction, and then extract only when faced with the following clinical problems: severe crowding, bimaxillary protrusion, skeletal disharmony, dental asymmetry, pathological conditions [3, 4].



Figure 1.
Extraction of teeth due to crowding

Objective

The aim of this study was to determine the most common reasons for extraction of permanent teeth during orthodontic treatment.

Material and methods

The sample was selected from the dental documentation of the Orthodontic Department at Faculty of Dentistry, University of Sarajevo. A total of 120 individuals (68 girls and 52 boys), ageing between 14 and 20 years, were included in this study. All individuals had full clinical documentation including medical and dental history, orthopantomograms, lateral cephalograms and study casts. This study did not take into account indications for extraction of third molars.

Results

The results of the study (**Figure 2, Figure 3**) showed that the most common reason for extraction during the orthodontic treatment was crowding of teeth - 63 individuals (52.5%). The next orthodontic indication for tooth extraction was orthodontic camouflage and they were carried out in 25 individuals (20.8%). In 32 individuals (26.6%) tooth extraction was carried out for: dental asymmetry (11 individuals), caries complications (6 individuals), trauma (5 individuals) and dental anomalies (10 individuals).

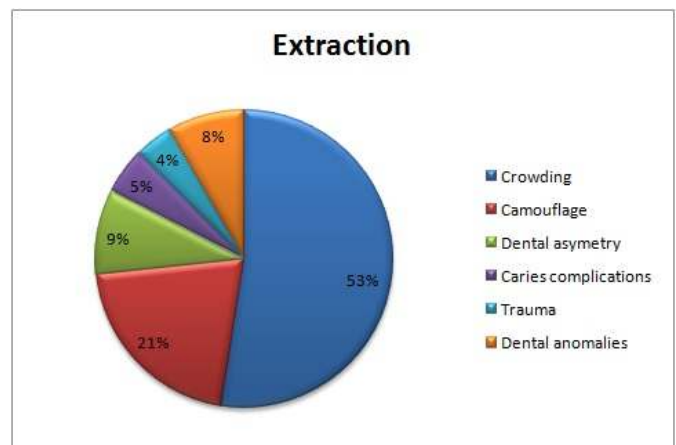


Figure 2.
The incidence rate of indications for teeth extraction.

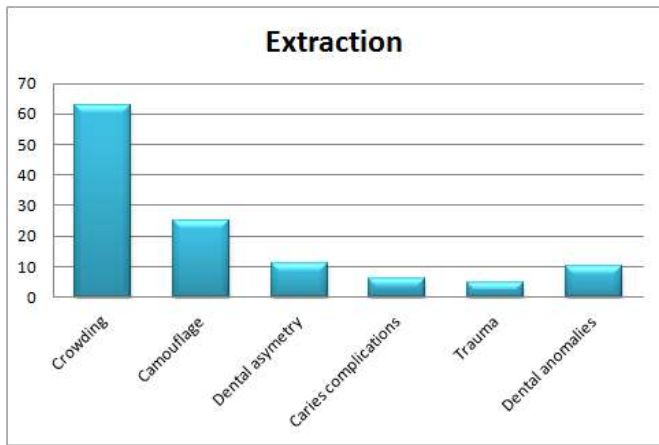


Figure 3.

The number of extracted teeth.

Discussion

In orthodontics, extractions have been traditionally highly debated and their percentage has displayed considerable variation throughout the years depending on treatment trends and other various factors [1, 2]. The most common indication for tooth extraction in our study was crowding caused by dentoalveolar disproportion, which were performed at 63 individuals (52.5%). These results are confirmed by some authors [3, 4]. Tooth mass - arch length discrepancy should be evaluated in upper and lower arches, but the lower arch is a priority because of greater difficulty in obtaining space.

Proffit and Fields developed a guide of contemporary procedures for evaluating extraction in Class I cases with crowding and/ or protrusion. The authors suggested that in negative lower arch discrepancies below 4 mm tooth extraction is rarely required, except in cases of incisor protrusion or posterior vertical discrepancy. Negative discrepancies in the lower arch between 5 mm and 9 mm allow treatment to be performed with or without extraction, depending on the characteristics of the patient and the orthodontic mechanic-therapy that was used. Finally, for negative discrepancies of more than 10 mm, extraction is almost always required, preferably of first premolars because second premolar extraction is not suitable for large discrepancies [1].

Another indication for tooth extraction was orthodontic camouflage; they were performed in 25 cases. Patients can have different degrees of concave

or convex profiles (strong, moderate or mild) or straight profiles. Bimaxillary dentoalveolar protrusion has become more acceptable in today's esthetic and functional viewpoint. However, if someone's teeth are too protrusive, the extraction of teeth remains the best orthodontic treatment to reduce this issue [5, 6].

According to the profile type, we can determine the need for extractions in orthodontic treatment. According to Ramos et al, for each 1 mm of retraction of the upper incisor the upper lip retracts 0.75 mm. It is necessary to remind that the facial aesthetics can not be compromised by orthodontic treatment [7]. With age, profile becomes more concave, and in better cases ends up with slightly protruded (convex) profile, in order to prevent the future concavity. Adult patients should avoid excessive relocation of anterior teeth towards lingual, because it may highlight creases and wrinkles and may create the impression of premature aging [8].

If the correction of skeletal (anteroposterior) discrepancy was not successful using the growth modification treatment, re-treatment is required. Tooth extraction imposed as the only possible solution, that will camouflage the existing discrepancy. In nongrowing patients (adults and older adolescents), the extraction of premolars remains a mechanotherapy to correct maxillary protrusion by retracting the maxillary incisors. In addition, patients who have moderate crowding and Class II occlusions can be successfully treated with the extraction of four bicuspids in order to correct these problems [9]. The assessment of dental and facial aesthetic is important factor of orthodontic diagnosis and treatment planning. Correcting position of the upper and lower dental midlines relative to each other and to the face is one of the biggest challenges for orthodontist.

The asymmetry between the dental and facial midlines is more noticeable in the upper arch and is in attractive. Patients with severe dental midline deviation relative to the face require tooth extractions. In our study eleven individuals (9.16%) had a tooth extraction due to the correction of midline discrepancies [10]. Small asymmetries can be corrected with intermaxillary elastics or mini-implants (in some cases, unilateral mechanics), asymmetric extractions, stripping. This deviation can be the main reason for many patients to seek orthodontic treatment [5].

Several conditions have an important role in the orthodontic treatment planning. Patients with dental extensive restorations, incorrect endodontic treatment, different dental anomaly, dental trauma have indications for tooth extraction. During orthodontics diagnosis and treatment planning these conditions should be considered [1,4]. Our results show twenty one individuals with extracted tooth due to one of these conditions. Thus, the different conditions greatly contribute to orthodontic treatments with tooth extractions [3].

Conclusion

The highest percentage of extraction during orthodontic treatment was carried out because of severe crowding, but the other reasons for extraction are not negligible in our clinical practice. The most important factor for extraction or non-extraction treatment approach is not presence or absence of space, but it is about a matter of maintenance or improvement of facial aesthetics and result stability. There are many reasons for an orthodontist to recommend extractions or non-extraction treatment. All of the dentists and specialists should continuously educate themselves to be able to understand the reasons for different treatment plans for different patients.

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