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Analysis factors in planning of orthodontic treatment with extraction

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Introduction

Nowadays dental extractions that aims orthodontic treatment are the most contentious. While planning orthodontic treatment, final decision to extract or not to extract is the most critical, but the final decision remains subjective and clinical experience is used to decide the treatment plan for the most appropriate outcome.

In the past, extraction treatment was dictated by high grade of relapse and technical limits, while today with development of new technics like: self-ligating brackets, maxillary expansion appliances, exploitation of growth potential, the number of extractions in orthodontic treatment is diminishing. [1,2]

Modern dentistry tends to keep each tooth on the arch, therefore before extraction of a permanent tooth, is essential to asses it's health status and if arches and teeth develop harmoniously. [2,3]

Treatment plan and diagnosis is based on patient's chief problems and evaluation of all possible methods to correct them. Orthodontic treatment is indicated only if at the end we obtain positive effects that patient desires, and it's not advised if it can not be achieved. [4]

The two most important reasons for extraction in orthodontics are:

1. Teeth aligning in severe crowding,
2. Teeth movements aimed to correct protrusion or camouflage therapy for skeletal class II and III. [4]

A detailed analysis is necessary for a rationale dental extraction in which the advantages and disadvantages should be evaluated for each case. Due to the scarcity of scientific evidence, understanding the specific diagnostic parameters influencing orthodontists in their treatment planning is important. [2]

Purpose

The purpose of the present study was to evaluate which criteria clinicians use to choose to extract or not to extract during orthodontic treatment, in order to establish a morpho-functional balance of stomatognathic apparatus.

Keywords

Dental extraction, dental crowding, profile.

Material and methods

A descriptive epidimiologic study was made. Fourteen patients, aged between 7-35 years were selected. All study subjects presented dento-maxillary anomalies. The records evaluated included pre-treatment study casts, panoramic radiographs (OPT), lateral cephalograms, intraoral photographs, Tweed-Merrifield analysis. For each diagnostic record specific criterias were reviewed:

- Intraoral examination: facial symmetry and proportionality, profile, smile, esthetic line, naso-labial folds, mental groove, lip step, facial angles.
- Biometric analysis of the dental casts: Bolton index for dental volume dicrepancy, Nance perimetry establishing available space vs necessary space, Pont and Korkhouse indeces for transversal and sagittzal developement, arch symmetry according to Fuss.
- OPT: each tooth health assesment, presence of dental pathologies, anomalies, supernumerary teeth, degree of root formation and dentoalveolar growth stage.
- Lateral Cephalometry (Ricketts, Tweed, Steiner, etc.): patient growth phase evaluation according to cervical vertebrae shape, growth pattern, soft and hard tissue profile, superior and inferior incisor inclination, facial triangle, overjet, necessary space for second and third molar eruption(Tweed-Merrifield method).

Female patient, 19 years old, chief complaint: esthetic and functional disorder; profile- convex; growth potential: exceeded; arch asymmetry; interincisal line deviated; retruded superior and inferior incisors; entopic 12, ectopic 34.

Diagnosis: Angle Class II division 2 malocclusion.

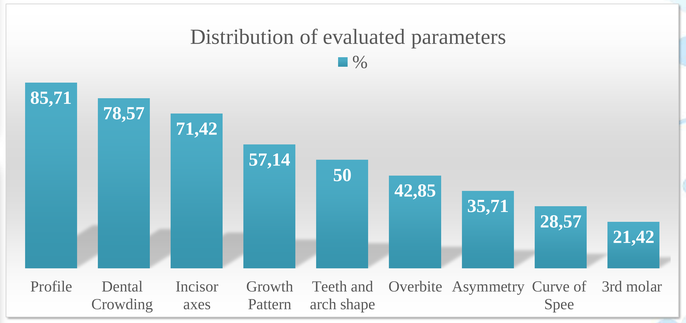
Treatment: Fixed bimaxillary orthodontic appliance, extraction of 15, 25.

Results

Based on clinical and paraclinical examinations we determined several factors that guides extraction or not extraction treatment: patient complaint; facial profile (straight, convex, concave); dental crowding (severe, mild, moderate); growth potential (early mixed dentition, late mixed dentition and early permanent dentition, permanent dentition- adult type); overbite; overjet; arch symmetry; growth pattern (normodivergent, hypodivergent, hyperdivergent); incisor axes (protrusion, retrusion); curve of Spee and presence of third molars.

All datas were compared with established normal values, and the choosen treatment plan included all treatment resorts needed to establish stomatognathic morpho-functional equilibrium.

Following parameters influencing decision-making process towards extraction or nonextraction were chosen for age groups: patients aged ≤12±2 years, growth potential was prevailing and for those aged ≥14±2 years, 85,71% patient profile, 78,57% dental crowding, 71,42% incisor axes was predominant.



Conclusions

1) Esthetics, facial profile, degree of dental crowding were the most important factors determining extraction for orthodonthic purpose.
2) Dental extractions are approached differently, due to growth potential and modern treatment choices like: modern orthodontic techinques, skeletal and dentoalveolar expansion, ussage of TAD' s, stripping.

References:
1. Chan E. *Extraction versus Nonextraction: THE FACTS*. Australian Society of Orthodontists (NSW Branch) Inc. in conjunction with the Orthodontic Discipline at the University of Sydney, 2015.
2. Evrard A. *Which factors influence orthodontists in their decision to extract? A questionnaire survey*. Journal of Clinical and Experimental Dentistry, 2019.
3. Mitchell L., Littlewood S. J. *An Introduction to Orthodontics.* 5th ed. Oxford University Press, 2019.
4. Proffit W.R. *Contemporary Orthodontics.* 5th ed. St-Louis, MO: Elsevier; 2013.