Avdelningen för ortodonti och pedodonti, Institutionen för odontologi

Karolinska Institutet

Influence of deciduous canine extractions on incisor alignment, dental arch dimensions and dental fear

AKADEMISK AVHANDLING

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SUMMARY

Interception of crowding, by extraction of deciduous and permanent teeth, to eliminate or at least facilitate orthodontic treatment has a long tradition. This treatment procedure, know as “guided eruption” or “serial extraction” was re-introduced by Robert Hotz and Birger Kjellgren in 1947-48. The sequential extraction procedure begins with the removal of the deciduous canines in the early mixed dentition and additional extractions of deciduous first molars and permanent bicuspids are considered after careful monitoring of dental arch development.

Few studies have evaluated the entire treatment procedure, especially the first phase including extraction of the deciduous canines. Dentists have therefore had to rely mainly on clinical experience and consequently this established procedure has become controversial.

The general aim of this work has been to evaluate the effects on incisor alignment and dental arch dimensions after interceptive deciduous canine extractions. Furthermore, patient’s reactions to these extractions regarding pain, discomfort and dental fear are described.

Paper I examined the reproducibility of and agreement between a conventional (using plaster casts) and a 3D virtual technique for recordings used in orthodontic study cast analysis.

Paper II and III were randomized controlled trials involving 73 and 71 children respectively, stratified for gender. Paper II evaluated the early effects on mandibular incisor irregularity and rotation together with changes in dental arch dimensions, overjet and overbite. Paper III evaluated the long-term effects on mandibular and maxillary incisor irregularity and rotation together with changes in dental arch dimensions, overjet and overbite. Paper IV explored procedural and postoperative pain and discomfort among child dental patients undergoing orthodontic extractions of four deciduous canines. Changes in dental fear ratings from pre- to post-treatment were also investigated.

The conclusions based on the results from the studies are that:

The conventional method showed better reproducibility for angular variables, but no clear pattern was found for differences between the two methods in reproducibility of linear variables. Reproducibility was considered clinically acceptable for both methods, although systematic errors indicated that the two methods should not be used interchangeably.

Extraction of deciduous canines can not be expected to improve maxillary or mandibular incisor alignment in a significant way and should therefore not be recommended for the relieve of incisor crowding. The congruent results between professional visual assessment and conventional measurements concerning alignment strengthen the validity of the treatment outcome results. No major effect was seen on arch dimensions, overjet or overbite.

The extraction of four deciduous canines was not found to trigger or increase dental fear and should not cause major post-operative inconvenience. A small number of individuals though had very high ratings of pain and discomfort at several occasions, revealing a need for updating clinical routines for pain management.

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