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Cochrane Reviews are regularly updated as new evidence emerges. The Cochrane Library should be consulted for the most recent version of reviews. The current status of all oral health-related reviews can be found on the Cochrane Oral Health Group's website at www.ohg.cochrane.org/reviews.html.

ABSTRACT

Interventions for replacing missing teeth: management of soft tissues for dental implants

Background

Dental implants are usually placed by elevating a soft tissue flap, but in some instances, they can also be placed flapless reducing patient discomfort. Several flap and suturing techniques have been proposed. Soft tissues are often manipulated and augmented for aesthetic reasons. It is often recommended that implants are surrounded by a sufficient width of attached/keratinized mucosa to improve their long-term prognosis.

Objectives

To evaluate whether (1a) flapless procedures are beneficial for patients, and (1b) which is the ideal flap design; whether (2a) soft tissue correction/augmentation techniques are beneficial for patients, and (2b) which are the best techniques; whether (3a) techniques to increase the perimplant keratinized mucosa are beneficial for patients, and (3b) which are the best techniques; and (4) which are the best suturing techniques/materials.

Search strategy

The Cochrane Oral Health Group's Trials Register, The Cochrane Central Register of Controlled Trials, MEDLINE and EMBASE were searched. Handsearching included several dental journals. Authors of all identified trials, an internet discussion group and 55 dental implant manufacturers were contacted to find unpublished randomised controlled trials (RCTs). The last electronic search was conducted on 15 January 2007.

Selection criteria

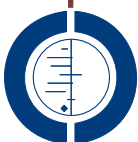
All RCTs of root-form osseointegrated dental implants comparing various techniques to handle soft tissues in relation to dental implants. Outcome measures were: prosthetic and implant failures, aesthetics evaluated by patients and dentists, biological complications, postoperative pain, patient preference, ease of maintenance by patient, and width of the attached/keratinized mucosa.

Data collection and analysis

Screening of eligible studies, assessment of the methodological quality of the trials and data extraction were conducted in duplicate and independently by two review authors. Authors were contacted for missing information. Results were expressed as random-effects models using mean differences for continuous outcomes and risk ratios for dichotomous outcomes with 95% confidence intervals (CI). Heterogeneity was to be investigated including both clinical and methodological factors.

Main results

Eight potentially eligible RCTs were identified and five trials including 140 patients in total were included. Two trials (100 patients) compared flapless placement of dental implants with conventional flap elevation, two trials (20 patients) crestal versus vestibular incisions, and one trial (20 patients) Erbium:YAG laser versus flap elevation at the second-stage surgery for implant exposure. On a



patient, rather than per implant basis, implants placed with a flapless technique and implant exposures performed with laser induced statistically significant less postoperative pain than flap elevation. There were no other statistically significant differences for any of the remaining analyses.

Authors' conclusions

Flapless implant placement is feasible and has been shown to reduce patient postoperative discomfort in adequately selected patients. There is insufficient reliable evidence to provide recommendations on which are the best incision/suture techniques/materials, or whether techniques to correct/augment perimplant soft tissues or to increase the width of keratinized/attached mucosa are beneficial to patients or not. Properly designed and conducted RCTs are needed to provide reliable answers to these questions.

Plain language summary

Dental implants are usually placed by elevating a soft tissue flap, but in some instances, they can also be placed without flap elevation reducing postoperative discomfort. Several flap and suturing techniques have been proposed. Soft tissues are often manipulated and augmented for aesthetic reasons. It is often recommended that implants are surrounded by 'firm' (attached/keratinized) soft tissues rather than 'movable' mucosa to improve their long-term prognosis.

The review found some weak evidence from only two studies with few patients that the flapless placement of dental implants reduces postoperative discomfort (pain and swelling), without jeopardizing implant success (one study only) in selected patients. There is insufficient evidence to recommend a specific flap (two small pilot studies) or suturing technique. There are not reliable trials indicating whether soft tissue correction/augmentation techniques are needed and which is the best one, or whether there is benefit in increasing the width of the firm keratinized mucosa surrounding dental implants.

Esposito M, Grusovin MG, Maghaireh H, Coulthard P, Worthington HV. Interventions for replacing missing teeth: management of soft tissues for dental implants. *Cochrane Database of Systematic Reviews* 2007, Issue 3. Art. No.: CD006697. DOI: 10.1002/14651858.CD006697.

ABSTRACT

Orthodontic treatment for prominent upper front teeth in children

Background

Prominent upper front teeth are an important and potentially harmful type of orthodontic problem. This condition develops when the child's permanent teeth erupt and children are often referred to an orthodontist for treatment with dental braces to reduce the prominence of the teeth. If a child is referred at a young age, the orthodontist is faced with the dilemma of whether to treat the patient early or to wait until the child is older and provide treatment in early adolescence. When treatment is provided during adolescence the orthodontist may provide treatment with various orthodontic braces, but there is currently little evidence of the relative effectiveness of the different braces that can be used.

Objectives

To assess the effectiveness of orthodontic treatment for prominent upper front teeth, when this treatment is provided when the child is 7 to 9 years old or when they are in early adolescence or with different dental braces or both.

Search strategy

The Cochrane Oral Health Group's Trials Register, CENTRAL, MEDLINE and EMBASE were searched. The handsearching of the key international orthodontic journals was updated to December 2006. There were no restrictions in respect to language or status of publication.

Date of most recent searches: February 2007.



Selection criteria

Trials were selected if they met the following criteria:

- design - randomised and controlled clinical trials;
- participants - children or adolescents (age < 16 years) or both receiving orthodontic treatment to correct prominent upper front teeth;
- interventions - active: any orthodontic brace or head-brace, control: no or delayed treatment or another active intervention;
- primary outcomes - prominence of the upper front teeth, relationship between upper and lower jaws;
- secondary outcomes: self esteem, any injury to the upper front teeth, jaw joint problems, patient satisfaction, number of attendances required to complete treatment.

Data collection and analysis

Information regarding methods, participants, interventions, outcome measures and results were extracted independently and in duplicate by two review authors.

The Cochrane Oral Health Group's statistical guidelines were followed and mean differences were calculated using random-effects models. Potential sources of heterogeneity were examined.

Main results

The search strategy identified 185 titles and abstracts. From this we obtained 105 full reports for the review. Eight trials, based on data from 592 patients who presented with Class II Division 1 malocclusion, were included in the review.

Early treatment comparisons: Three trials, involving 432 participants, compared early treatment with a functional appliance with no treatment. There was a significant difference in final overjet of the treatment group compared with the control group of -4.04 mm (95% CI -7.47 to -0.6, chi squared 117.02, 2 df, $P < 0.00001$, $I^2 = 98.3\%$). There was a significant difference in ANB (-1.35 mm; 95% CI -2.57 to -0.14, chi squared 9.17, 2 df, $P = 0.01$, $I^2 = 78.2\%$) and change in ANB (-0.55; 95% CI -0.92 to -0.18, chi squared 5.71, 1 df, $P = 0.06$, $I^2 = 65.0\%$) between the treatment and control groups.

The comparison of the effect of treatment with headgear versus untreated control revealed that there was a small but significant effect of headgear treatment on overjet of -1.07 (95% CI -1.63 to -0.51, chi squared 0.05, 1 df, $P = 0.82$, $I^2 = 0\%$). Similarly, headgear resulted in a significant reduction in final ANB of -0.72 (95% CI -1.18 to -0.27, chi squared 0.34, 1 df, $P = 0.56$, $I^2 = 0\%$).

No significant differences, with respect to final overjet, ANB, or ANB change, were found between the effects of early treatment with headgear and the functional appliances.

Adolescent treatment (Phase II): At the end of all treatment we found that there were no significant differences in overjet, final ANB or PAR score between the children who had a course of early treatment, with headgear or a functional appliance, and those who had not received early treatment. Similarly, there were no significant differences in overjet, final ANB or PAR score between children who had received a course of early treatment with headgear or a functional appliance.

One trial found a significant reduction in overjet (-5.22 mm; 95% CI -6.51 to -3.93) and ANB (-2.27 degrees; 95% CI -3.22 to -1.31, chi squared 1.9, 1 df, $P = 0.17$, $I^2 = 47.3\%$) for adolescents receiving one-phase treatment with a functional appliance versus an untreated control.

A statistically significant reduction of ANB (-0.68 degrees; 95% CI -1.32 to -0.04, chi squared 0.56, 1 df, $P = 0.46$, $I^2 = 0\%$) with the Twin Block appliance when compared to other functional appliances. However, there was no significant effect of the type of appliance on the final overjet.

Authors' conclusions

The evidence suggests that providing early orthodontic treatment for children with prominent upper front teeth is no more effective than providing one course of orthodontic treatment when the child is in early adolescence.



Plain language summary

Prominent upper front teeth are an important and potentially harmful type of orthodontic problem. This condition develops when the child's permanent teeth erupt and children are often referred to an orthodontist for treatment with dental braces to reduce the prominence of the teeth. If a child is referred at a young age, the orthodontist is faced with the dilemma of whether to treat the patient early or to wait until the child is older and provide treatment in early adolescence.

The evidence suggests that providing orthodontic treatment, for children with prominent upper front teeth, in two stages does not have any advantages over providing treatment in one stage, when the children are in early adolescence.

Harrison JE, O'Brien KD, Worthington HV. Orthodontic treatment for prominent upper front teeth in children. *Cochrane Database of Systematic Reviews* 2007, Issue 3. Art. No.: CD003452. DOI: 10.1002/14651858.CD003452.pub2.



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