

Treatment of large overjet in preadolescents

Studies of treatment effects, cost assessment and patient perceptions
- a comparison of two removable functional appliances

Akademisk avhandling

Som för avläggande av odontologie doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, Göteborg, den 3:e mars 2017, klockan 9.00

av *Emina Čirgić*

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Avhandlingen baseras på följande delarbeten

- I. Čirgić E, Kjellberg H, Hansen K. Treatment of large overjet in Angle Class II: division 1 malocclusion with Andresen activators versus prefabricated functional appliances-a multicenter, randomized, controlled trial. *Eur J Orthod* 2016; 3 (5): 516-524.
- II. Čirgić E, Kjellberg H, Hansen K. Discomfort, expectations and experience during treatment of large overjet with Andresen activator or prefabricated functional appliance, a questionnaire survey. *Acta Odontol Scand.* 2017 Jan 2:1-7. *Epub ahead of print.*
- III. Čirgić E, Kjellberg H, Hansen K, Lepp M. Adolescents' experiences of using removable functional appliances. *Orthod Craniofac Res.* 2015; 18: 165-174.
- IV. Čirgić E, Kjellberg H, Petzold M, Hansen K. A cost minimization analysis of large overjet reduction with two removable functional appliances based on a randomized controlled trial. *Under review in Eur J Orthod.*

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Abstract

The aims were to compare clinical effectiveness, functional and social discomfort, explore and describe preadolescents' experiences of treatment, and assess the costs of reducing large overjet with an Andresen Activator (AA) and a Prefabricated Functional Appliance (PFA).

Subjects and methods: A multicentre, prospective randomized clinical trial was conducted with patients from 12 general dental practices. Ninety-seven patients with an Angle Class II, Division 1 malocclusion, and an overjet of ≥ 6 mm, were randomly allocated by lottery to treatment with either a PFA or an AA. The study was designed as intention to treat (ITT), and the endpoint of treatment was set to overjet ≤ 3 mm, followed by a 6-month retention period. The PFA and AA group consisted of 57 (28 girls, 29 boys), and 40 subjects (16 girls, 24 boys), respectively, with a mean age of 10.3 years. Overjet, overbite, lip seal, and sagittal molar relationships were recorded before and at the end of treatment, and 1-year post-treatment. One month and 6-months after treatment start, a questionnaire addressing discomfort, perception of treatment need and outcome, was used. Individual interviews focusing on adolescents' experiences of using a removable functional appliance were carried out with 21 adolescents.

Direct costs and indirect costs were analysed with reference to ITT (intention-to-treat), successful, and unsuccessful outcomes. Societal costs were described as the total of direct and indirect costs, and did not include retreatments.

Results: No difference in effectiveness could be shown between PFAs and AAs in correcting overjet, overbite, sagittal molar relationship, and lip seal. No difference in experienced functional and social discomfort after 6 months of appliance wear was seen between groups. Participants developed their own strategies of measurement for improvement. The results clearly show that in terms of cost-minimization, PFA is the preferred approach for reduction of large overjet in mixed dentition.

Conclusions: PFAs are as effective as AAs in correcting overjet, overbite, sagittal molar relation, and lip seal. The success rate of treatment with both appliances is, however, low. Thus, the PFA, requiring lower costs, should be used for reduction of large overjet in mixed dentition. No difference could be seen between groups for the experience of functional or social discomfort after 6 months of appliance use. An active involvement of the preadolescents in treatment seems to be necessary, supported by the dentist in future appointments, using overjet measurement as a tool for motivation. Furthermore, efforts should be made by clinicians to listen and understand preadolescents' needs and requirement before treatment start.

Keywords: Orthodontics, preadolescents, large overjet, overjet reduction removable functional appliance, discomfort, phenomenography, interview, cost assessment.