International Journal of Osteopathic Medicine (2013) 16, 99—113

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International Journal of Osteopathic Medicine

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REVIEW

Efficacy of osteopathy and other manual treatment approaches for malocclusion — A systematic review of evidence

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Received 29 June 2011; revised 19 March 2012; accepted 24 July 2012

KEYWORDS
Temporomandibular joint disorders;
Physical therapy modalities;
Musculoskeletal manipulations;
Malocclusion/therapy;
Osteopathic medicine;
Osteopathic manipulative treatment;
Manipulative therapies;
Chiropractic;
Myofunctional therapy

Abstract *Backgroundand objectives:* The osteopathic literature often underlines the need for manual treatment of malocclusion. This literature review will investigate the efficacy of osteopathic and other manual treatment approaches for malocclusion.
Data sources: A systematic literature review was undertaken by searching medical and osteopathic databases (Pubmed, DIMDI, Osteopathic Research Digital Repository, Physiotherapy Evidence Database (PEDro), www.chiroindex.org, www.osteopathic-research.com). Other relevant osteopathic journals that are not indexed (e.g. Osteopathische Medizin, Osteopathic Medicine and Primary Care) were also searched. The keywords 'dental occlusion' and 'malocclusion' were combined with keywords for various manual treatment approaches.
Study selection and data extraction: As few hits were anticipated, the inclusion criteria were fairly wide and not too strict in terms of quality. Identified studies were categorized according to Sacketts' levels of evidence, and assessed using Downs and Black's quality checklist for healthcare interventions.
Results: Of 30 articles that met the inclusion criteria, 13 were experts' opinions with hardly any evidence. As such, this review focused on the remaining 17 studies: 12 case series, three case—control studies, one systematic review of case—control studies, and one methodologically weak randomized controlled trial. Most of the studies in this review were of poor quality. By applying Downs and Black's quality assessment tool problems with internal and external validity could be identified. Most of the studies had confounding or selection bias. Only three studies attained more than half of the maximum score on the Downs and Black's quality assessment tool.

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http://dx.doi.org/10.1016/j.ijosm.2012.07.006

Conclusions: A few studies reported some changes in malocclusion associated with osteopathy and other manual treatment approaches. As such, there is a need for high-quality research in this area.
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Implications for clinical practice

- Since no evidence for change of malocclusion by osteopathy could be shown yet, patients should be informed of that and the question of necessity of orthodontic treatment should be raised.
- In patients with malocclusion treated (additionally) by osteopathy, the parameters overjet and overbite seem to be influenceable most likely.
- The article presents factors influencing craniofacial growth. Thes factors should be considered in treatment of patients with malocclusion. Furthermore they should be considered in every child treated by an osteopath because the sooner treatment takes place, the easier craniofacial growth pattern might be influenced.

Introduction

The need for interdisciplinary activities between osteopaths and dentists is often voiced in the literature.[1–12] In particular, relationships between dentistry and manipulative treatment approaches have become closer in the case of temporomandibular disorders. In addition to the manipulative treatment of temporomandibular disorders, the need to treat malocclusions is often mentioned in the osteopathic literature.[6–8,10,13,14] Although good results are generally achieved by orthodontic treatment, even alternative orthodontists demand multidisciplinary approaches.[15–25] The lack of stability of long-term outcomes may be the main argument for accompanying manipulative treatment.[26]

Malocclusion is the misalignment of teeth or incorrect relationship between the teeth and the dental arches. There are various classifications for malocclusions; the best-known and most widely used classification is that by Angle.[27] This is determined by the relative position of the rows of teeth to each other.

The aetiology of malocclusion is important for the development of effective treatment concepts, but is not yet entirely understood. Genetic, embryological and functional components play a role. Some of the functional components could serve as a starting point for manipulative treatment approaches, and should be considered in more detail. No evidence exists regarding parafunctional habits (e.g. thumb-sucking) as contributing factors. Orofacial dysfunctions such as an open-mouth posture, pathological tongue position, visceral swallowing and articulation problems are considered to be of importance as weak, long-term forces have a greater formative influence than strong, short-term forces.[28,29] A large cross-sectional-study by Stahl et al. found a significant increase in orofacial dysfunction during the change from milk teeth to mixed dentition.[30] Self-regulation of disturbed functional processes is unlikely.[30,31] However, most distal bites are not due to functional disturbance.[31]

Several authors have discussed mouth breathing as a contributing factor to malocclusion.[4,15,25,27,32] However, as Stahl et al. only found problems with the nasal airways in 1.7% (first dentition) and 3% (mixed dentition) of subjects, they interpreted mouth breathing as a postural problem.[30] The relationship between breathing, posture and mouth has also been discussed by others.[22,23,28,33] In particular, prognathia and protrusion seem to be associated with mouth breathing.[16,23,34] In terms of tongue function, several theories serve as a basis for myofunctional treatment approaches like Myofunctional Therapy (MFT). One theory is that the altered tongue resting position due to the open-mouth posture[32] causes pathological swallowing.[21,35] Padovan viewed the balance between the centrifugal forces of the tongue and the centripetal forces of the buccinator mechanism as decisive for the resulting tooth position.[36] Therefore, the buccinator musculature seems to play a role in the lateral tooth position.[37] Pflaum and Pflaum discussed a glossoptosis/posterior displacement or retraction of the tongue in the absence of centripetal forces of the tongue,

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