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Cervical spine posture and Twin-block treatment

I read with great interest the excellent article entitled, Evaluation of cervical spine posture after functional therapy with twin-block appliances: A retrospective cohort study (Kamal AT, Fida M. *Am J Orthod Dentofacial Orthop* 2019;155:656-61). These authors found that craniocervical posture became more upright after Twin-block therapy. Craniocervical posture was also found to be related to the size of the mandible, which in turn has been related to airway size.¹

Timms² postulated that a reduction in oropharyngeal airway after mandibular setback surgery might be compensated for by cervical hyperflexion, and this was later confirmed by several studies.²⁻⁶

It is well established that Class II patients have a reduced oropharyngeal airway compared with Class III patients, with Class I being intermediate.⁷ Craniocervical angle was found to be on average 10° larger in patients with obstructive sleep apnea,⁸ who incidentally also have reduced oropharyngeal airway dimensions.

Treatment with the Twin-block appliance has been shown to increase the width of the oropharyngeal airway,^{1,9,10} which may well account for the change in craniocervical posture. Thus, once an adequate airway has been established, it is no longer necessary for the patient to compensate for an inadequate airway by cervical hyperflexion, and they revert to their normal posture.

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Authors' response

Thank you for your keen interest in our article (Kamal AT, Fida M. Evaluation of cervical spine posture after functional therapy with twin-block appliances: A retrospective cohort study. *Am J Orthod Dentofacial Orthop* 2019;155:656-61).

One of the characteristic skeletodental findings that has been well established in Class II patients is that they lack an upright cervical posture.¹⁻³ Research in the field of orthopedics has revealed various vertebral anomalies and postural abnormalities associated with

mandibular retrognathia and the subsequent airway impairment.⁴⁻⁶ As discussed in our article, the cervical posture is dependent on interactions within the musculoskeletal system and physiological growth processes, and a close anatomical relationship exists between the cervical spine and the mandible.⁷⁻¹⁰

In our study, the twin-block helped upright the cervical posture as it has been seen to do so in various other studies.^{11,12} Mandibular advancement appliances improve upper airway dimensions and should thereby reduce the hyperflexion of the cervical spine.¹³ Technological advancements such as cone-beam computed tomography are of greater value in diagnosing airway impairment compared with lateral cephalograms. Therefore, they can be used to determine improvements in the pharyngeal airway volume to delineate the importance of functional appliances in patients with mandibular retrognathism.¹⁴ As such, conclusions can be drawn concerning the use of functional appliances for improvements of airway dimensions.

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