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175672 Kinematics and muscular activation during chewing in unilateral posterior crossbite

Thursday, March 21, 2013: 10:45 a.m. - 12:15 p.m.

Location: Room 619 (Washington State Convention Center)

Presentation Type: Oral Session

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Objective: Unilateral posterior crossbite is a serious asymmetric, worsening malocclusion occurring at an early stage of development, during the eruption of the primary dentition. It involves the masticatory function characterized by an increased frequency of reverse sequencing chewing cycles during chewing on the affected side only. The aim of the study is to evaluate the kinematics and muscular activation in reverse and non reverse chewing patterns on the crossbite side and on the normal side of patients with unilateral posterior crossbite.

Method: One hundred and ten children ($9,1 \pm 1.2$ yr of age) with unilateral posterior crossbite were selected for the study. Electromyography and kinematics were simultaneously recorded during mastication of a soft bolus and a hard bolus.

Result: The percentage of reverse cycles in the group of patients was $57.0 \pm 31.1\%$ (soft bolus) and $68.7 \pm 27.9\%$ (hard bolus) when chewing on the crossbite side. When chewing on the non-affected side, the number of reverse cycles was $10.2 \pm 21.5\%$ (soft bolus) and $13.2 \pm 21.3\%$ (hard bolus). The reverse patterns on the crossbite side were different with respect to the patterns on the non-affected side being narrower and positioned along the vertical axis. Both types of cycles resulted in lower EMG activity of the masseter of the crossbite side than the contralateral masseter, being the activity of the non-affected side larger for reverse than for non-reverse cycles.

Conclusion: It was concluded that when chewing on the crossbite side, the masseter activity is reduced and it is similar or increased on the contralateral side, resulting in a serious asymmetrical masticatory function. The reduction in the percentage of reverse cycles is important for decreasing the altered muscular activity. The functional

correction of the chewing cycles should be an important aim of the orthodontic therapy.

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Keywords: Function, Growth & development, Malocclusion, Muscle and Occlusion