

ORTHODONTIC TREATMENT OF YOUNG OSTEOGENESIS IMPERFECTA PATIENTS WITH THE FUNCTIONAL FRÄNKEL APPLIANCE.

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Osteogenesis imperfecta (OI) causes a variety of craniofacial changes of which skull and facial bone deformities can often be clinically observed. One such feature is mandibular prognathism, which is more frequent in OI than in a healthy population. It can result from excessive mandibular growth, surprisingly often from hypoplastic development of the maxilla, or from their combination. In OI, mandibular prognathism appears to be relative in nature – mandible is of normal size, but it is protrusive in relation to the midfacial bones which are through sutures attached to the defectively developed cranium. The relative mandibular prognathism is at the dental level associated with anterior crossbite. These patients may suffer from difficulties in chewing and compromised facial esthetics. Severe mandibular prognathism is successfully treated with orthognathic surgery in healthy adults, whereas milder cases can be helped with functional orthodontics and face mask treatment during growth. However, in OI, the brittleness of the facial bones, the abnormal collagen metabolism, and the eventual presence of a dentin defect make the orthodontic treatment planning complicated. Based on our clinical experience and the lack of documented orthodontic management reports of OI patients, the solution has apparently often been to retreat from any treatment. Our purpose was to seek for a method to guide with a minimum risk the growth of the jaws towards a more balanced direction taking benefit from the OI patients' own growth potential during childhood.

The removable appliance by the German Dr. Fränkel was designed to selectively enhance the growth of the jaws by stretching the periosteum. Although it was designed earlier than 1969 when Moss presented his theory on the functional matrix, it is based on the idea that soft tissue pressure and tension affect the form and size of the bones. Since this appliance does not exert direct force on teeth or facial bones, it appeared ideal for treatment of disharmonious maxillary growth in OI. Here we show preliminary results of two patients with types IA and IB OI and a tendency for mandibular prognathism, who entered the Fränkel treatment three and two years ago. Notably, the treatment was commenced when upper first permanent incisors started to erupt. Development of anterior crossbite, present in the primary dentition, was prohibited in the permanent dentition, and an improvement of the facial profile was obtained. The results encourage us to continue this treatment in OI patients, carefully selected for diagnosis, age, and co-operation.

Reference: Proceedings of the 7th International Conference on Osteogenesis Imperfecta. Montreal, Canada, 1999.