

Research Article Summary Malocclusions in Children with OI

An article recently published by the OI team from the Shriners Hospital for Children- Canada in Montreal examined a serious dental-skeletal problem – malocclusions. The team demonstrated that malocclusions were significantly more severe in children with OI than in children without OI.

A malocclusion is an abnormal relationship between the upper and lower jaws or teeth. It creates problems in the way the teeth come together. This may be due to the poor relationship of the upper and lower jaws to each other, the alignment of the teeth, or both. This type of problem usually includes crooked teeth, protrusive or retrusive jaws, “cross-bite,” “over-bite” and “open-bite.” Treatment is usually provided by an orthodontist. For children with OI Type III and IV it is usually necessary to be treated by an orthodontist in a craniofacial center. The particular treatment plan depends on the specific problem(s) with the bite and the teeth. If the malocclusion is caused by skeletal discrepancies then orthognathic (jaw) surgery may be required along with orthodontia. The main goal of all treatments is to provide better chewing function and improve appearance.

This study is the first major look at this specific dental problem in children who have OI. Other dental issues that are associated with OI such as dentinogenesis imperfecta, impacted teeth and delayed tooth development have been studied more often. A group of 49 children with OI, who were seeking orthodontic care, were evaluated at the craniofacial dental center in Montreal. Participants were between 5-19 years old, about evenly split between boys and girls and represented mild, moderate and severe forms of OI. OI Type I was reported in only 16% of the participants. This low number is indicative of the fact that most children with Type I OI can be treated outside a special setting. All of the OI participants were receiving intravenous bisphosphonate therapy. The control group was age and sex matched and were “otherwise healthy children” seeking orthodontic treatment.

This study had two major findings:

- Malocclusions in OI children were much more severe than in the control group.
- Children with moderate and severe OI (OI Types IV and III) had the most severe malocclusions. The malocclusions were not only affecting their appearance but severely impairing their chewing capacities. In fact this study describes that children with Type III and Type IV OI have more complex malocclusions that are much harder to treat.

What does this mean?

- Children with Type I OI may be treated like any orthodontic patient as long as they do not have dentinogenesis imperfecta. In addition extra care must be taken to move the teeth more slowly than the usual practice.
- Children with OI Type III and Type IV in need of orthodontic treatment need to be evaluated on a case by case basis.

What needs more Study?

The effect of IV bisphosphonate use on complex dental procedures needs further study. As much as it helps long bones there is some evidence that bisphosphonates inhibit tooth movement and may have an effect on normal craniofacial development. The effect of specific treatments for malocclusions and other craniofacial problems also needs study.

Recent correspondence with Dr. Retrouvey, one of the authors on this paper, indicated that the Montreal center has begun follow studies on these questions using OI mice. The studies are examining if treatment with a bisphosphonate affects teeth and how teeth may be moved efficiently in OI patients.

Why is this study important?

For the first time, the extent of the problem has been described which is an important first step to improved care options. Current treatments result in variable results due to the severity of the malocclusion and no single treatment could be recommended, for all children who have OI. Future treatments may have to involve prosthodontics rehabilitation. It is hoped that this information about the extent of the malocclusion problem in children with OI will lead to studies for new and improved treatments that will further improve the quality of life for all people who have OI.

Study title: Evaluation of the severity of malocclusions in children affected by osteogenesis imperfecta with the peer assessment rating and discrepancy indexes.

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This article appeared in the Summer 2013 issue of Breakthrough the OI Foundation newsletter.

Thank you to Dr. Jean-Mark Retrouvey, Director, Division of Orthodontics McGill University in Montreal and Dr. James Hartsfield, Director, College of Dentistry University of Kentucky and member of the OI Foundation's Medical Advisory Council for reviewing the article.