Non-Osteotomy Treatment of Class III Skeletal Malocclusion using Bollard Plates

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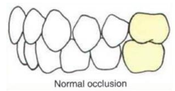
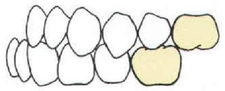
BACKGROUND

- **Maxillary hypoplasia is frequently found in Class III Malocclusion patients**
- **Traditional Treatment options include use of protraction face mask anchored to dentition or a more invasive Le Fort osteotomy**
- **Bone Anchored Maxillary Protraction devices provide skeletal anchorage**
- **Requires active sutures in growth phase, skeletal anchorage buttress and remodeling of adjacent bone**
- **Less invasive than osteomies**


Normal occlusion


Class III Malocclusion

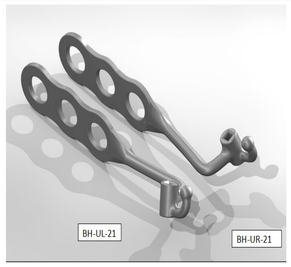
INTRODUCTION

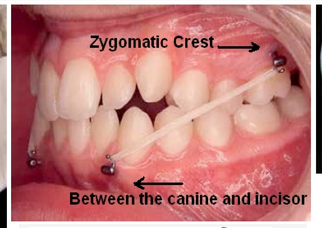
In this study, we analyze the effect of maxillary advancement in patients with class III skeletal malocclusions using a non-osteotomy technique that produces combined maxillary advancement and mandibular retraction using bone anchored Bollard plates (Tita-Link, Brussels, Belgium). We evaluate the change in WITS appraisal and ANB values for each patient before and after treatment.

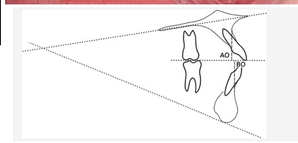
MATERIALS AND METHODS

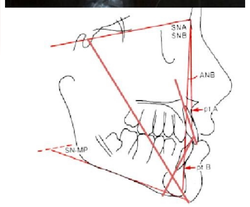
A total of 14 patients were enrolled in the study at cervical vertebral maturation stage CVM2. Bilateral FDA approved miniplates (Bollard plates) were surgically inserted in the infrazygomatic crests of the maxilla and between the canine and the lateral incisor in the anterior mandible. The patients were treated by intermaxillary elastics for an average of 16 months. Cephalometric analysis was done before, during and at the end of the treatment. Intraoral and extraoral photographs were taken for comparisons.

BOLLARD PLATES

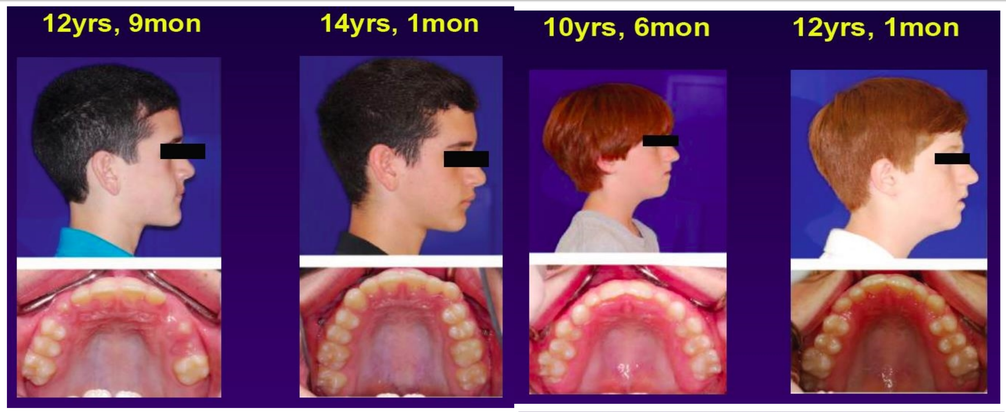








BEFORE AND AFTER



RESULTS

Bollard Plate Study Patients*

	N	Age at start	(Range)
All	13	12.3 yrs	(11.1-14.1)
Female	9	12.2	(11.2–14.1)
Male	4	12.4	(11.1–13.1)

* all with Angle Class III skeletal malocclusion & cervical vertebral maturation stage CVM2

Results - Bollard Patients

		START ANB	END ANB	
All	(13)	- 0.2	+ 2.3	
Female	(9)	+ 0.1	+ 2.6	
Male	(4)	- 1.0	+ 1.8	
		WITS	**WITS**	**Duration of Rx**
All	(13)	-9.2	- 3.9	16.4 months
Female	(9)	-8.4	-3.4	17.8
Male	(4)	-11.0	- 4.8	13.4

CONCLUSIONS

The WITS appraisal value showed a remarkable increase from an average of -9 to -2.64 in this patient pool. Most of the patients showed an increase in the ANB values by 2 to 3 degrees. There was a 100% success in changing the mandible to maxillary relation. There were minor complications in 4 patients including loosening of the plates which were easily treated. None of the patients suffered major issues such as infection, nerve injury or dental complications. Because of the minimum complications and the maximum benefits related to the Bollard plates, this novel treatment approach shows promising future results for the treatment of patients with class III skeletal malocclusions.

References: Nguyen T, Cevidanes L, Cornelis MA, Heymann G, de Paula LK, De Clerck H. Three-dimensional assessment of maxillary changes associated with bone anchored maxillary protraction. Am J Orthod Dentofacial Orthop. 2011 Dec;140(6):790-8