

Case Study - “The Dragonfly”

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Introduction

Our aim is showing the skeletal effects of our previously introduced Class-III-Appliance “The Dragonfly” in early mixed dentition. The anterior development of the maxilla and reduction of the gonial angle are fundamental goals, as skeletal effects are important for longterm success.

Discussion & Conclusion

The metric results indicate that the individually manufactured Class III appliance reduces the gonial angle and helps anterior development of the maxilla. Further studies are ongoing with regard to its clinical use and effectiveness in comparison to the gold standard use of Hyrax-expanders and facemasks.

Methods

We tested the appliance in clinical use on a 9-year-old patient (f) with frontal crossbite and mesial basal relation. The Dragonfly appliance was bonded (light cured) and the upper jaw was expanded according to WALA. Class III elastics had to be worn for 22 hours/day. Treatment was followed by standard evaluation of clinical metrics and cephalometric results.

References & Acknowledgment

- 1) Tarraf NE et al, 2023: A retrospective comparison of two protocols for correction of skeletal Class III malocclusion in prepubertal children: hybrid hyrax expander with mandibular miniplates and rapid maxillary expansion with face mask.
- 2) Mandall N. et al, 2022: Early class III protraction facemask treatment reduces the need for orthognathic surgery: a multi-centre, two-arm parallel randomized, controlled trial.
- 3) Alexandra K. Papadopoulou et al, 2019: A retrospective long-term comparison of early RME-facemask versus late Hybrid-Hyrax, alt-RAMEC and miniscrew-supported intraoral elastics in growing Class III patients.

Results

The comparison of the cephalometric and clinical metrics before and after treatment showed an increased SNA-Angle and decreased SNB-Angle. The ANB-Angle and WITS have improved significantly. The gonial angle has decreased drastically. All these results are considered favorable for Class III treatments in short- and longterm outcomes.



Check the data!



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Intraoral appliance



Fig. 1: Expander appliance



Fig. 2: bonded Lower Arch plate



Fig. 3: Hooks for intermaxillary elastics

Cephalometric Results

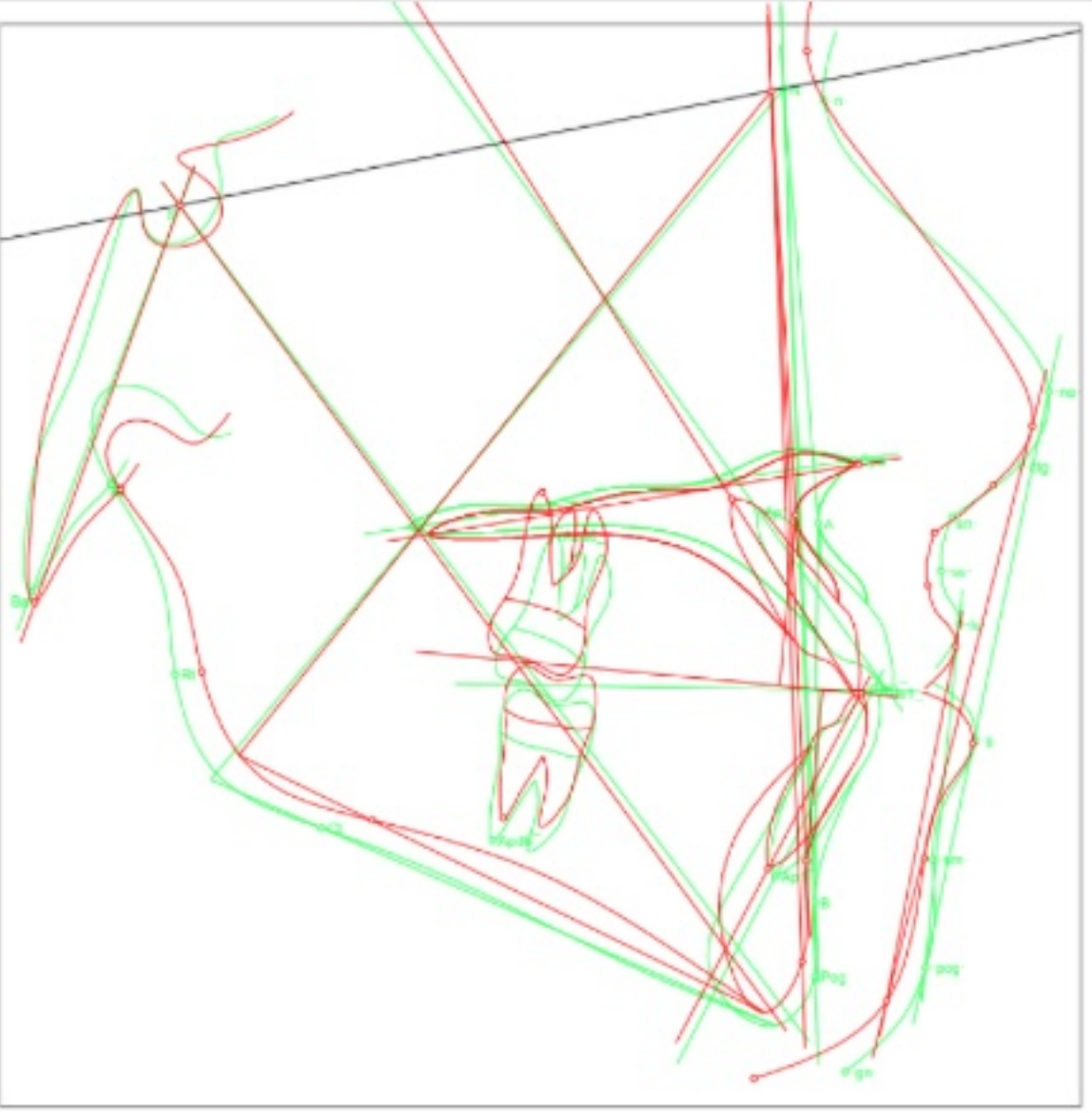


Fig.4: Cephalometric tracing
1. Before, 2. After

Patient: 27.05.2014 · weiblich				Nummer:									
Analyse: Rostock FRS				Alter: (Jahre)									
Aufnahme: 23.01.2023													
Variable	Norm	Auswertung 23.01.2023	Differenz	Standardabweichung 5 4 3 2 1 0 1 2 3 4 5									
vertikale Analyse													
NSBa (°)	130,0±6,0°	121,0°	-9,0°										
NL-NSL (°)	8,5±2,0°	1,8°	-6,7°										
ML-NSL (°)	32,0±3,0°	37,0°	+5,0°										
ML-NL (°)	23,5±2,0°	35,3°	+11,8°										
ArGoMe (°)	128,0±7,0°	140,1°	+12,1°										
NGoMe (°)	69,0±5,0°	77,3°	+8,3°										
NSGn (°)	66,0±3,0°	63,6°	-2,4°										
Face Height Relation (%)	63,5±2,0 %	60,1 %	-3,4 %										
Summenwinkel (°)	396,0±6,0°	397,1°	+1,1°										
Index	80,0±9,0 %	73,7 %	-6,3 %										
sagittale Analyse													
SNA (°)	82,0±2,0°	82,3°	+0,3°										
SNB (°)	80,0±2,0°	81,7°	+1,7°										
ANB (°)	2,0±1,0°	0,7°	-1,3°										
ANB individualisiert (°)													
WITS (mm)	1,0±1,0 mm	-5,0 mm	-6,0 mm										
SNPg (°)		81,1°											
Metrik													
SN (mm)		69,4 mm											
Oberkieferlänge (mm)		42,0 mm											
Unterkieferlänge (mm)		68,7 mm											
dentale Analyse													
OK1-NSL (°)	102,0±2,0°	111,5°	+9,5°										
OK1-NA (°)	22,0±2,0°	29,2°	+7,2°										
OK1-NA (mm)	4,0±2,0 mm	5,7 mm	+1,7 mm										
UK1-ML (°)	90,0±2,0°	91,9°	+1,9°										
UK1-NB (°)	24,0±2,0°	30,6°	+6,6°										
UK1-NB (mm)	4,0±2,0 mm	7,2 mm	+3,2 mm										
Interinzisalwinkel (°)	133,0±4,0°	119,6°	-13,4°										
Holdaway (mm)	4,0±2,0 mm	8,2 mm	+4,2 mm										
Norderval (°)	58,0±7,0°	79,6°	+21,6°										
Weichteil Analyse													
Nasolabialwinkel (°)	110,0±10,°	118,4°	+8,4°										
Holdaway (°)	9,2±5,0°	13,6°	+4,4°										

Fig. 5: Cephalometric evaluation before treatment

Patient: 27.05.2014 · weiblich			Nummer:										
Analyse: Rostock FRS			Alter: (Jahre)										
Aufnahme: 19.01.2024 · Mehrafza													
Variable	Norm	Auswertung 19.01.2024 Mehrafza	Differenz	Standardabweichung 5 4 3 2 1 0 1 2 3 4 5									
vertikale Analyse													
NSBa (°)	130,0±6,0°	121,9°	-8,1°										
NL-NSL (°)	8,5±2,0°	2,4°	-6,1°										
ML-NSL (°)	32,0±3,0°	34,4°	+2,4°										
ML-NL (°)	23,5±2,0°	32,0°	+8,5°										
ArGoMe (°)	128,0±7,0°	132,1°	+4,1°										
NGoMe (°)	69,0±5,0°	73,9°	+4,9°										
NSGn (°)	66,0±3,0°	63,2°	-2,8°										
Face Height Relation (%)	63,5±2,0 %	61,4 %	-2,1 %										
Summenwinkel (°)	396,0±6,0°	394,4°	-1,6°										
Index	80,0±9,0 %	70,1 %	-9,9 %										
sagittale Analyse													
SNA (°)	82,0±2,0°	83,6°	+1,6°										
SNB (°)	80,0±2,0°	81,2°	+1,2°										
ANB (°)	2,0±1,0°	2,4°	+0,4°										
ANB individualisiert (°)													
WITS (mm)	1,0±1,0 mm	-0,3 mm	-1,3 mm										
SNPg (°)		81,0°											
Metrik													
SN (mm)		63,6 mm											
Oberkieferlänge (mm)		41,9 mm											
Unterkieferlänge (mm)		65,4 mm											
dentale Analyse													
OK1-NSL (°)	102,0±2,0°	114,8°	+12,8°										
OK1-NA (°)	22,0±2,0°	31,2°	+9,2°										
OK1-NA (mm)	4,0±2,0 mm	5,9 mm	+1,9 mm										
UK1-ML (°)	90,0±2,0°	94,1°	+4,1°										
UK1-NB (°)	24,0±2,0°	29,9°	+5,9°										
UK1-NB (mm)	4,0±2,0 mm	7,0 mm	+3,0 mm										
Interinzisalwinkel (°)	133,0±4,0°	116,6°	-16,4°										
Holdaway (mm)	4,0±2,0 mm	7,3 mm	+3,3 mm										
Norderval (°)	58,0±7,0°	79,5°	+21,5°										
Weichteil Analyse													
Nasolabialwinkel (°)	110,0±10,°	123,9°	+13,9°										
Holdaway (°)	9,2±5,0°	7,8°	-1,4°										

Fig. 6: Cephalometric evaluation after treatment