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Universal Neonatal Foot Orthotics (UNFO): A Novel Method to correct forefoot adduction, Preliminary report

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Metatrasus Adductus (MA), what do we know?

The most common foot deformity in newborns: 1-2/1000 births

- severe
 - Not correctable past neutral
 - Heel bisector at 4th toe or beyond
 - Deep medial skin crease
- moderate
 - Correctable to neutral
 - Heel bisector medial to 4th toe
 - Mild or no skin crease

- Natural History
 - Most cases will resolve spontaneously
 - 11-14% persistent and require treatment

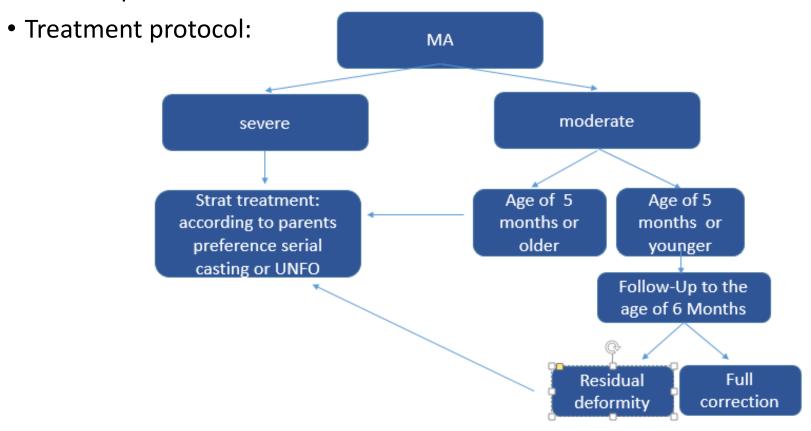
Treatment of Metatasus Adductus

- Serial casting (best results up to 8-9 month old babies)
 Occasionally followed by an orthosis
 - Time consuming
 - messy
 - Interferes with bathing & hygiene
 - Slippage of the cast
 - Pressure sores

- Treatment options in unresolved MA among older children
 - Ignore
 - There is no functional impairment
 - Surgery
 - Stumbling
 - Esthetics
 - Footwear
 - Social

Materials and methods

- Retrospective study of our first 15 consecutive patients treated with UNFO (June 2014 – November 2015)
- Follow up of 2 months minimum after cessation of treatment



What is UNFO

- Universal Foot Orthotics
 - 2 sizes
- > 3 point pressure
 - Heel held firmly
 - Point of pressure against the 1st metatarsal head
 - Strap for increasing pressure gradually over base of 5th metatarsus







UNFO treatment protocol

- UNFO was first applied for 23 hours a day
- Weaning gradually when full correction was achieved
 - 3-4 weeks 18 hours
 - 3-4 weeks 12 hours night time
 - Stop UNFO
 - (if the parents wish, continue night time bracing as long as it fits)
 - Follow-up 3 week
 - Follow-up when walking
 - Follow-up at the age of 1.5 and 2 years

Patients details

	Pat.	Foot	age 1 st visit months. weeks	flexibility	Heel bisector	Age UNFO application	Age at last F-Up months
1	YM	R	2.3	very	4	5.1	1.05 y
2	MMS	R	6	very	4	6	1.03y
3	LD	L	3.2	neutral	4	4	7
4	AD	R+L	3	neutral	4-5, 4	3.1	6.2
5	RYF	L	4	very	3-4	5.3	10.3
6	GMD	L	6.3	neutral	4-5	7	1.03
7	RG	R+L	4	Neutral	4, 4	4	8.2
8	LHM	R	2.3	very	3-4	6.3	12
9	ZYH	R+L	3	very	3, 4	4.2	8
10	SY	R+L	3.5	very	3-4, 3	5.3	7.2
11	KF	R+L	2	neutral	4-5, 4-5	5.1	8.2
12	ОМ	R+L	6.5	neutral	4-5, 3-4	6.2	9.1
13	LC	L	6.2	VERY	4-5	7.2	11.2
14	ZT	R+L	5.2	very	4, 4-5	6.3	12
15	GL	L	3.1	neutral	4	6.1	11

Results

- 15 patients, 22 feet (5 Lt 3 Rt 7 bilateral) followed until end of treatment
- 7 Patients severe MA (11 feet)
- 8 Patients moderate MA (11 feet)
- Age at beginning of treatment 3.1-7.2 months (average 5 months +2 weeks)
- Time to full correction: following visit (4 days-3 weeks)
- Final outcome resolution of MA in all cases
- Side effects minor
 - Superficial wounds 1
 - Redness of the skin 4
 - Slippage of UNFO 2
 - Device wear 1
 - Excessive sweating 1

Discussion

- About 11-14% of MA do not resolve spontaneously
- The optimal age for treatment of MA is up to the age of 9 months
- Treatment options include serial casting or usage of adjustable orthosis
- We present our experience with treatment of MA among young babies using a new orthosis - UNFO - which fits tightly to the babies foot and by the three-point fixation principle corrects the deformity
- The amount of pressure over the apex of the deformity is controlled by an adjustable velccro strap easy to apply and manipulate by the baby's caregivers
- This method is better tolerated by the infant and caregivers and is less time and effort consuming then serial casting
- In comparison to the Bebax orthosis UNFO is easily applied and manipulated by one caregiver
- In comparison to the Wheaton brace the advantage of UNFO is leaving the ankle joint and leg out of the brace
- Treatment was begun as soon as the baby was diagnosed as having severe MA or only if spontaneous resolution has not occurred up to the age of 6 months
- Correction was achieved within 3 weeks with only few minor side effects

Conclusion

- Metatarsus adductus in infants should not be ignored
- Severe deformities or deformities which have not improved spontaneously up to the age of 6 months should be treated
- Treatment with UNFO is a safe and effective method to correct metatarsus adductus deformity in infants up to the age of 9 months
- There were only minor side effects as redness of the skin or superficial wounds which healed after a day or two without the orthosis

The authors declare of no conflict of interest