

Non-surgical Treatment of Neonate Ear Deformities

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ABSTRACT

Genetic or mechanical ear deformities — except microtias — can be treated by a conservative approach in the first 72 hours of life by means of the ear's anatomical modeling with hydrophilic cotton (a low cost material) and fixation with micropore adhesive tape for 10 to 21 days. In this stage the level of maternal estrogen in the neonate circulation reduces quickly, allowing a natural hardening of the cartilage to its permanent shape.

INTRODUCTION

In the fetus' prenatal period its cartilages, ligaments, and connective tissue are relaxed by the estrogen, in order to facilitate the passage through the parturition channel. By this time, the ear's congenital deformities may arise from abnormalities in the morphogenesis or could be a result of the external pressure or malposed fetus. These malformations will be definitive as the level of circulating estrogen decreases, leading to the hardening of the cartilages as reported by Matsuo⁽¹⁾ in 1982 (Table I) and Forst⁽²⁾ in 1986.

Whenever it's possible to conservatively intercede in the first 3 days of life by means of a molding plaster, the deformities may be permanently corrected.

MATERIAL & METHODS

The study started with 31 children being treated in 1984

in the baby ward of Hospital Felício Rocho's maternity, in Belo Horizonte, Brazil. In 1986 another 31 children were treated in Santa Casa de Misericórdia Hospital in Juiz de Fora, Brazil.

All 62 cases were examined by a pediatrician and no other congenital deformities were reported. It was possible to identify six different kinds of isolate/associate and unilateral/bilateral deformities after the examination of the children's ears. A total of 133 deformities were treated.

Two months later, 39 children with a total of 97 deformities returned for revision. It was possible to observe a favorable evolution regarding the anatomical shape of the ears in this short follow-up (Table II).

Twenty children totalling 46 deformities were exam-

ined in a late follow-up, from 1990 to 1993, with ages ranging from 4 to 9 years old. The correction was considered favorable.

CHOSEN METHOD

Once identified the deformity, the child's family was advised to use the conservative treatment. After authorized, the neonate was photographed and the ears were molded utilizing Hoffmann solution (equal parts of alcohol and ether) in order to degrease the skin and Benjoin tint to help the fixation of the adhesive tape (Fig. 1).

- a) Small hydrophilic cotton rolls embedded in water or saline solution.
- b) The anterior (external) and posterior (internal) sulcus are molded by apposing the compressed cotton, allowing an anatomical conformation to the ear (Fig 2).
- c) The mold is fixed with small micropore strips (Fig. 3).
- d) The plaster is reinforced with wider strips in the surrounding skin, in order to fix the ear in its new position (Fig. 4).

The plasters were made within the first 72 hours of life and were kept for a period that ranged from 10 days in minor defects

to 21 days in more severe cases.

STATISTICAL EVALUATION

In a 2 months follow-up it was possible to review 39 cases (with 97 defects) out of 62 (with 133 defects). The high incidence of deformities is explained by the bilaterality in most cases and for the existence of more than one kind of deformity in the same ear, in other cases.

For better evaluation of the results, all cases were divided into 4 groups: Excelent, Good, Regular and Fair, according to the kind of deformity (Table III).

It is important to notice that an expressive group

Age	E1 (pg/ml)	E2 (pg/ml)	Percent E2 in Girls
Maternal vein at birth	12.770	17.300	
Umbilical artery	13.180	5.070	
2 hours	1.100	370	2.84
24 hours	150	70	2.90
48 hours	75	40	
72 hours	50	30	2.52
2 weeks			1.48
6 weeks			1.06
1 - 7 years	< 20	< 10	> 0.87
12 - 14 years	20 - 177	10 - 270	
Adults	20 - 182	15 - 400	

Plasma Estrone (E1), Estradiol (E2), and Free Estradiol Values*.
 * Free or nonprotein-bound E2 (which is biologically active) concentration in females for the first 72 hours of life are approximately 2.5 times higher than those of adult females. After 72 hours of life, the percentage of free E2 decreases, and by 6 weeks of age, it is similar to that of older prepubertal children. Source: From W. Hung, G.P. Aubust, and A. M. Glasbow, The Ovary, in Pediatric Endocrinology, New York: Medical Examination Publishing Co., 1978.

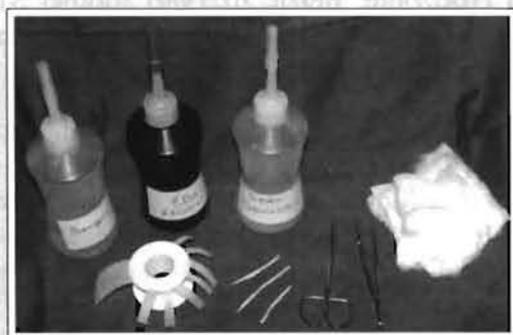


Fig. 1 - Materials utilized.
 Fig. 1 - Materiais utilizados.



Fig. 2 - Molding of the ear.
 Fig 2 - Modelagem da orelha.



Fig. 3 - Fixation of the mold with micropore strips.
 Fig. 3 - Fixação do molde com micropore.



Fig. 4 - The molding is reinforced with wide strips of micropore tape.
 Fig. 4 - Reforço do molde com tiras largas de micropore.

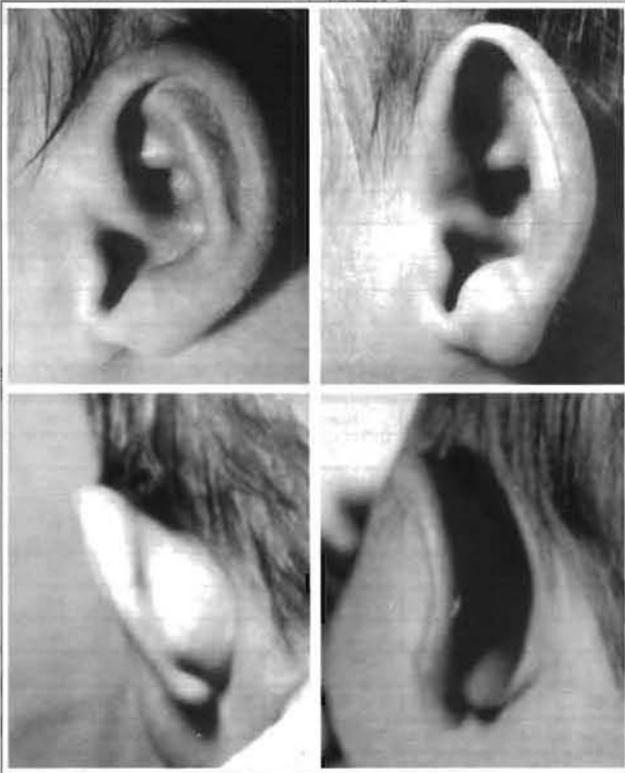


Fig. 5 - Neonate of V. G., born in 8/31/84 with familiar antecedents. Presented left lop ear treated at 63 hours of life. Plasters were kept for 21 days, with an Excellent degree of correction.

Fig. 5 - R. N. de V. G., d.n.: 31/8/84, com antecedente familiar, apresentando orelha em abano à esquerda. Curativo com 63 horas de vida, mantido por 21 dias, com excelente grau de correção.

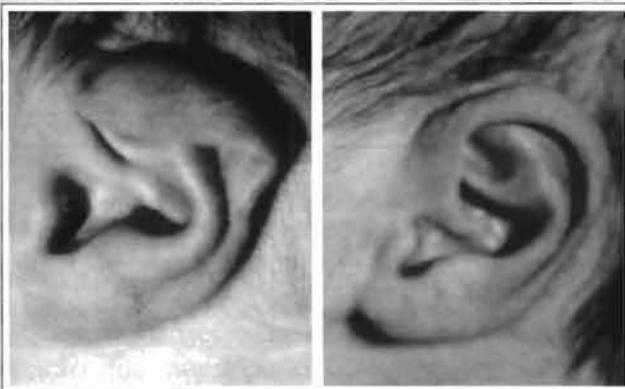


Fig. 6 - Neonate of M. C. S. P. S. born in 9/9/1984 without familiar antecedents. Presented lop ear. Plaster made with 28 hours of life and kept for 21 days. Excellent degree of correction.

Fig. 6 - R. N. de M. C. S. P. S., d.n.: 9/9/1984, sem antecedente familiar, apresentando orelha dobrada ou "Lop ear" à direita. Curativo com 28 horas de vida, mantido por 21 dias, apresentando excelente grau de correção.

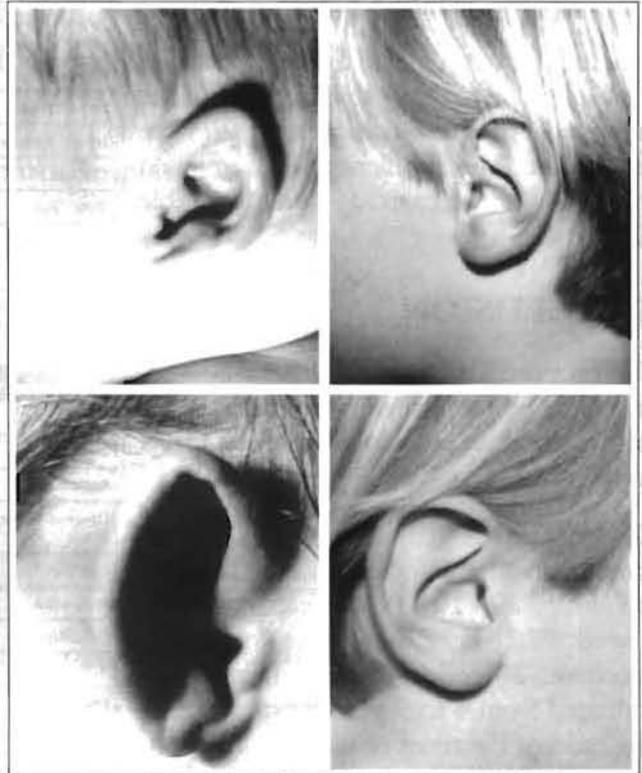


Fig. 8 - Neonate of C. I. A., born in 7/15/1986. Presented left lop and cup ear; right lop ear. Treated at 72 hours of life. Plasters were kept for 21 days. Four years postoperative.

Fig. 8 - R.N. de C. I. A., d.n.: 15/7/1986. Orelha em xícara (Cup ear) e em abano à esquerda, orelha em abano à direita. Curativo com 72 horas de vida, mantido por 21 dias. Pós-tratamento de 4 anos.

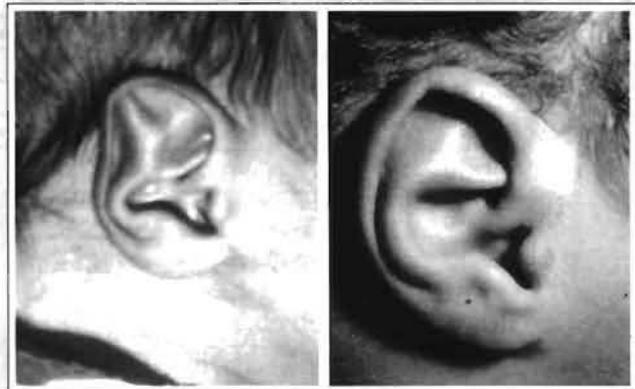


Fig. 7 - Neonate of J. N. M. born in 7/21/1986 without familiar antecedents. Presented unilateral Stahl's ear. Plaster made at 63 hours of life and kept for 10 days. Excellent degree of correction.

Fig. 7 - R. N. de J. N. M., d.n.: 21/7/86, sem antecedente familiar, apresentando Stahl's ear unilateral. Curativo com 48 horas de nascido e mantido por 10 dias, com excelente grau de correção.

(72.18%) was ranked Excelent.

In a late follow-up (more than 4 years later) it was possible to verify that out of 39 cases examined 2 months postoperative, 20 were reexamined. The Excellent group remained at 73.91% of the cases, as shown in Table IV.

CONCLUSION

The proposed method proved to be very simple to be performed, with efficient results as long as employed in the first 72 hours of life.

62 cases were treated, in a total of 133 congenital auricular deformities. In a 2 month follow-up, 39 cases (97 defects) were reviewed. 72.18% of these were considered Excellent. 20 children (46 defects) were evaluated from 4 to 9 years postoperative. The ratio of Excellent results remained unchanged (73.91%), meaning a definitive correction.

Due to the efficiency and facility of this method, it should be divulged to professionals in the hospitals' nurseries, in order to make this preventive approach a reality and thus to avoid a more traumatic surgical correction in the future.

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Deformity	Number Tratament	Number Don't Return	Revision 2 Months
Lop Ear	38	9	29
Smooth Helix	17	4	13
Irregular Upper Pole	20	8	12
Cup Ear	30	14	16
Stahl's Ear	13	0	13
Prominent Ear	15	1	14
	133	36	97

Period and Number of Controls by Deformities.

Deformity	Excellent	Good	Regular	Weak	Total
Lop Ear	20	1	8	0	29
Smooth Helix	9	3	1	0	13
Irregular Upper Pole	11	0	0	1	12
Cup Ear	10	0	4	2	16
Stahl's Ear	12	0	1	0	13
Prominent Ear	8	0	5	1	14
	70	4	19	4	97
Percents	72.18%	4.12%	19.58%	4.12%	100%

Degree of Correction at 2 month old children and 97 Deformities 23 children with deformities didn't return for control.

Deformity	Excellent	Good	Regular	Weak	Total
Lop Ear	10	0	4	0	14
Smooth Helix	4	2	0	0	6
Irregular Upper Pole	5	0	0	0	5
Cup Ear	5	0	2	1	8
Stahl's Ear	6	0	0	0	6
Prominent Ear	4	0	3	0	7
	34	2	9	1	46
Percents	73.91%	4.35%	19.57%	2.17%	100%

Degree of Correction between 4 and 9 years old in 20 children with 46 deformities.

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