XII CONGRESSO
NAZIONALE
FIMP 2018

LUCA LEVRINI

SUZIONE E RESPIRO: SVILUPPO E INTERRELAZIONI

SUZIONE E RESPIRO:
SVILUPPO E INTERRELAZIONI

- premesse
- il problema respirazione orale
- succhietto e respirazione orale
- conclusioni

Risks and Benefits of Pacifiers

SUMI SEXTON, MD, *Georgetown University School of Medicine, Washington, District of Columbia*
RUBY NATALE, PhD, PsyD, *Mailman Center for Child Development, Miami, Florida*

Physicians are often asked for guidance about pacifier use in children, especially regarding the benefits and risks, and when to appropriately wean a child. The benefits of pacifier use include analgesic effects, shorter hospital stays for preterm infants, and a reduction in the risk of sudden infant death syndrome. Pacifiers have been studied and recommended for pain relief in newborns and infants undergoing common, minor procedures in the emergency department (e.g., heel sticks, immunizations, venipuncture). The American Academy of Pediatrics recommends that parents consider offering pacifiers to infants one month and older at the onset of sleep to reduce the risk of sudden infant death syndrome. Potential complications of pacifier use, particularly with prolonged use, include a negative effect on breastfeeding, dental malocclusion, and otitis media. Adverse dental effects can be evident after two years of age, but mainly after four years. The American Academy of Family Physicians recommends that mothers be educated about pacifier use in the immediate postpartum period to avoid difficulties with breastfeeding. The American Academy of Pediatrics and the American Academy of Family Physicians recommend weaning children from pacifiers in the second six months of life to prevent otitis media. Pacifier use should not be actively discouraged and may be especially beneficial in the first six months of life. (*Am Fam Physician*. 2009;79(8):681-685. Copyright © 2009 American Academy of Family Physicians.)

▶ **Patient information:** A handout on pacifier use in infants, written by the authors of this article, is available at http://aafp.org/afp/20090415/681-s1.html.

Nonnutritive sucking is a natural reflex for a fetus and newborn, usually manifested by sucking the hands and fingers. The pacifier, also referred to as a "dummy," has been used as a method for fulfilling this innate desire.[1] Historically, pacifiers were viewed as beneficial until the early 1900s, when an anti-pacifier movement spread concerns that their use led to poor hygiene and indulgent behavior.[2] At present, there are mixed opinions as to whether pacifier use is beneficial, yet roughly 75 to 85 percent of children in Western countries use a pacifier.[3] *Table 1* summarizes the risks, benefits, and recommendations for pacifier use at various ages.[4-11]

Benefits

ANALGESIA

ffect and have
vention.
of
ger than six
lures in the emerge
ll amount of sucrose
given within two minu
one or in combination wit
er; the combination appear

to be more effective.[12,13] Several studies of full-term and preterm newborns showed that pacifiers were superior to various sweet solutions,[14-16] whereas a study of very preterm newborns showed that pacifiers in combination with sweet solutions were no better than sweet solutions alone.[17] A more recent study confirmed that pacifier use reduces crying time in infants undergoing venipuncture in the emergency department, especially in those younger than three months.[18] Pacifiers have been studied or recommended by the AAP for use with the following procedures: catheterization, circumcision, heel sticks, immunizations, insertion of an intravenous line, lumbar puncture, screening for retinopathy of prematurity, and venipuncture.[4,13,15,18,19]

PREMATURE INFANTS

A Cochrane review found that nonnutritive sucking is associated with shorter hospital stays, earlier transition to bottle feeding from enteral feeding, and improved bottle feeding.[20] Although the review did not show pacifiers have a significant impact on gain, behavior, energy intake, heart ygen saturation, intestinal tran- age at full oral feeds, none of reported harmful effects from

Risks and Benefits of Pacifiers

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1

2 [SIDS]

3

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1

2

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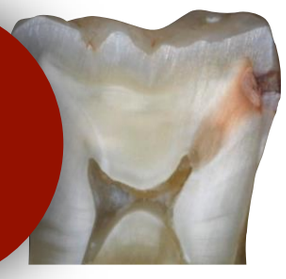

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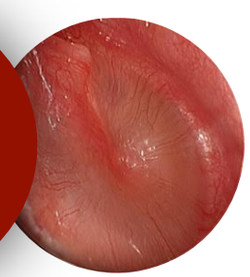

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può essere un problema più serio

700 MILA I BAMBINI ITALIANI FRA 2 E 10 ANNI CHE RESPIRANO MALE
Adnkronos - 10 motivi per cui è importante che il bambino respiri bene
1) non raggiunge le condizioni ottimali di salute con ridotto accrescimento
2) fa minor uso della respirazione nasale, con un maggior rischio di infezioni respiratorie e danni al cavo orale (si ammala di più)
3) disturbi del linguaggio
4) facile affaticabilità
5) alimentazione difficoltosa, con minor masticazione e dunque carenze nutrizionali
6) minore capacità di movimento nell'ambiente e di prestazioni sportive con riduzione della vita di relazione
7) disturbi del sonno
8) irritabilità e sonnolenza diurna
9) stanchezza al mattino e minor rendimento scolastico
10) tutto questo può incidere anche a livello psicologico, con un "danno all'immagine di sé e una caduta di autostima"

GIORNO

30-40%

NOTTE

russamento abituale 34.5% questionari

russamento patologico 12% registrato

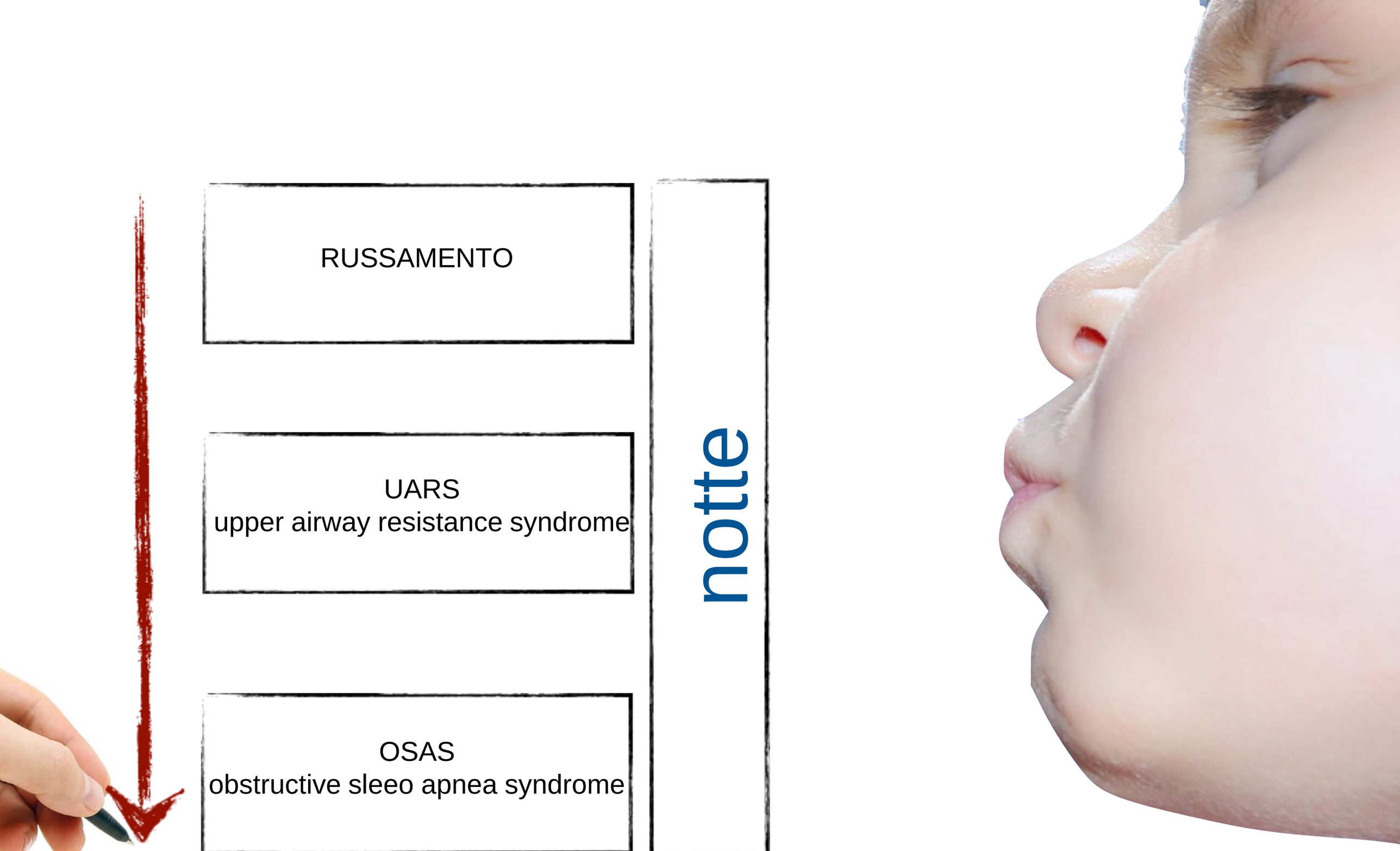
Prevalence of habitual snoring and sleep-disordered breathing in preschool-aged children in an Italian community.
Castronovo V, Zucconi M, Nosetti L et al
J Pediatrics 2003;142:377-82

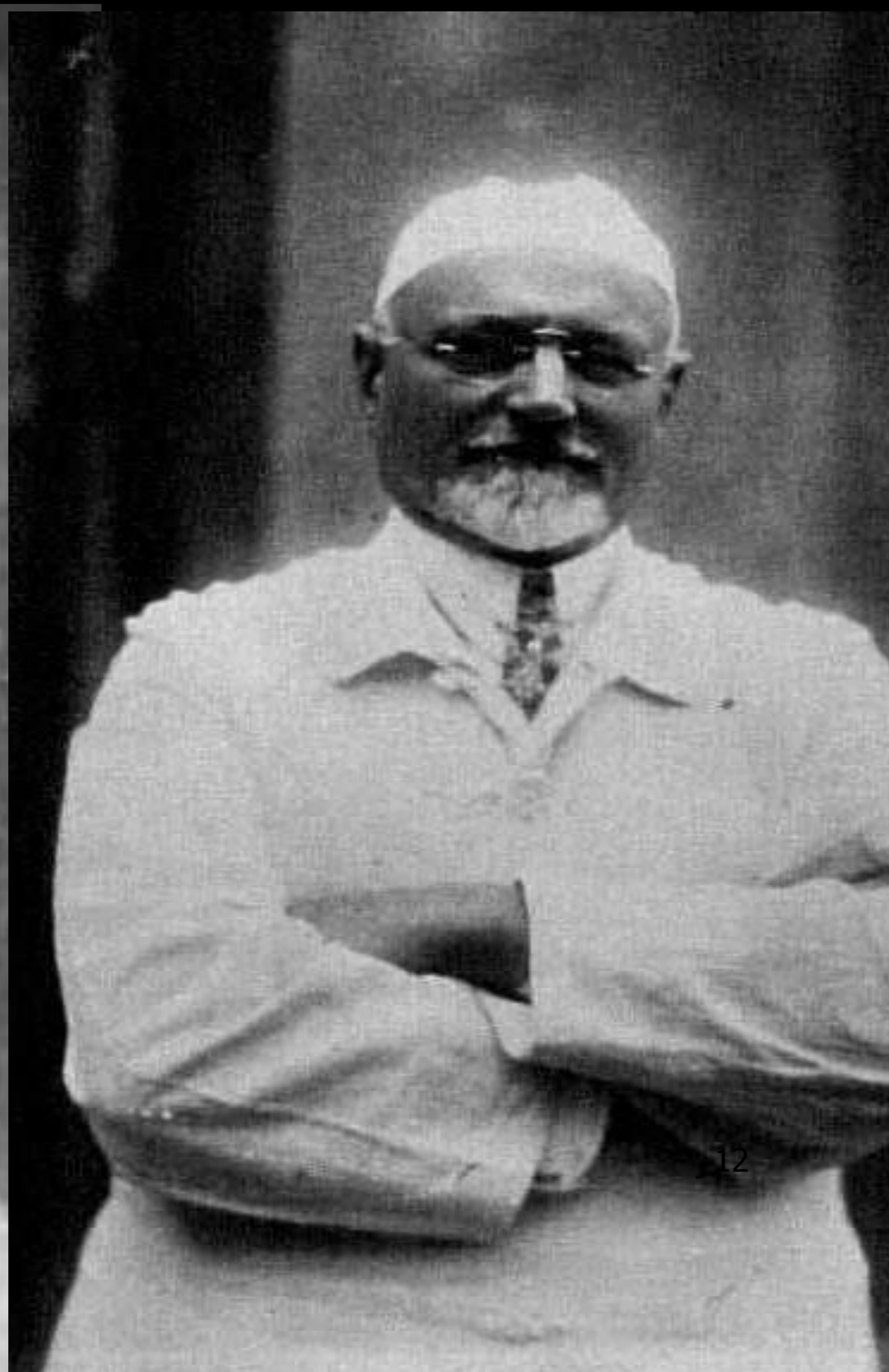
RUSSAMENTO

UARS
upper airway resistance syndrome

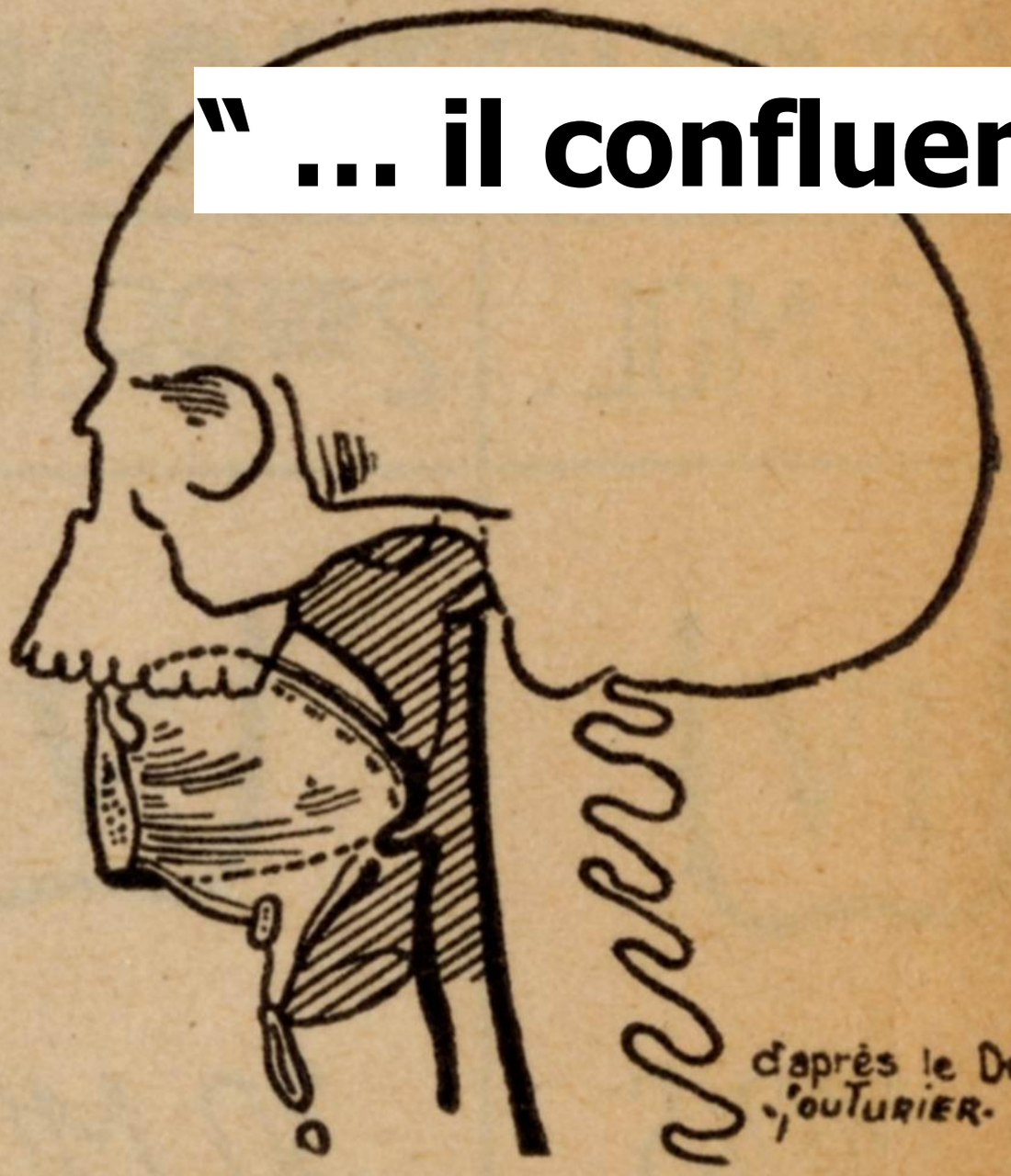
OSAS
obstructive sleeo apnea syndrome

notte





" ... il confluente vitale ... "

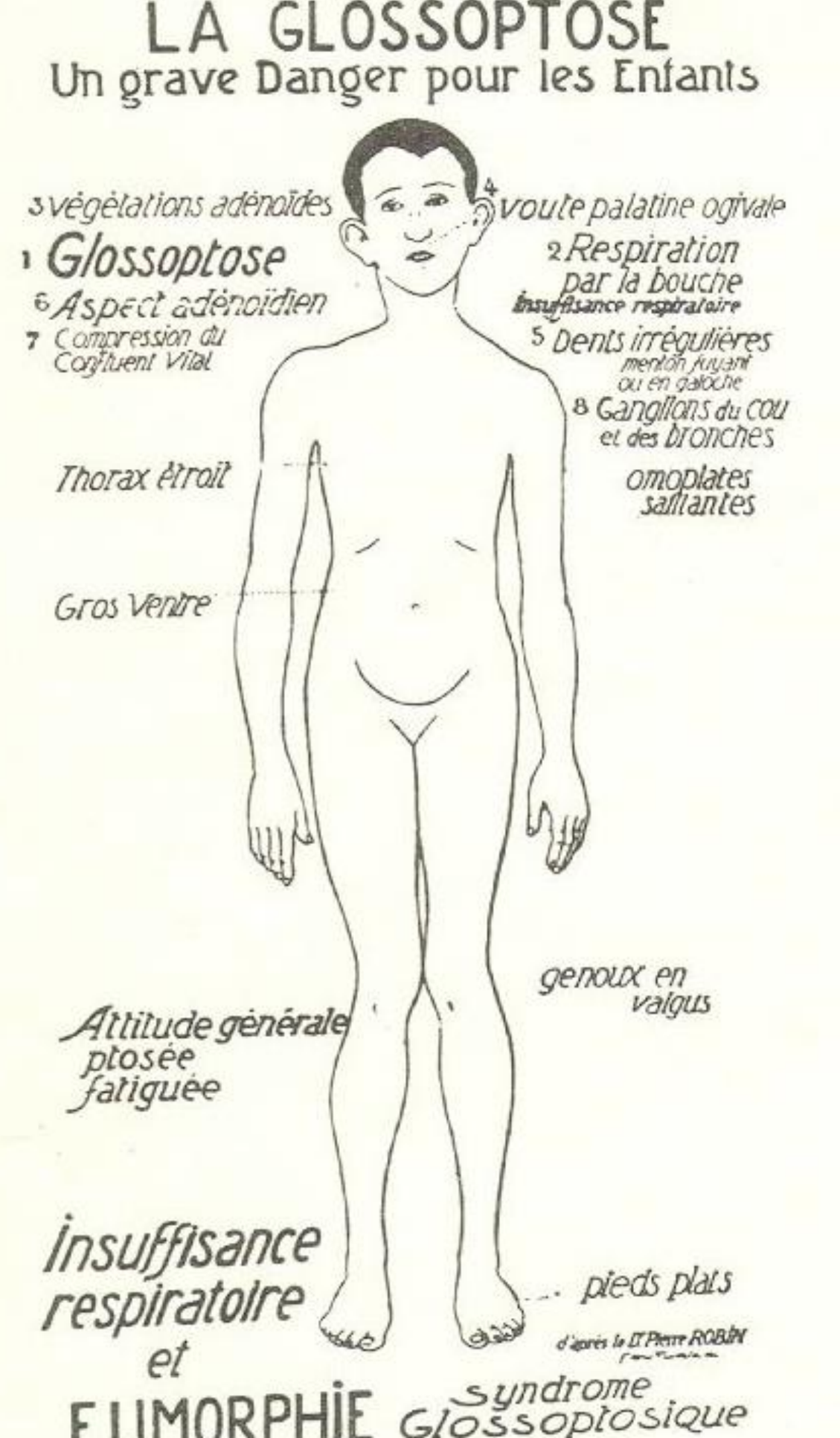


Confluent vital fonctionnel (en hachures)
OBSTRUÉ

Menton fuyant, langue refoulée contre la colonne vertébrale " Glossoptose "

Confluent vital fonctionnel (en hachures)
NORMAL

Menton droit, langue éloignée de la colonne vertébrale

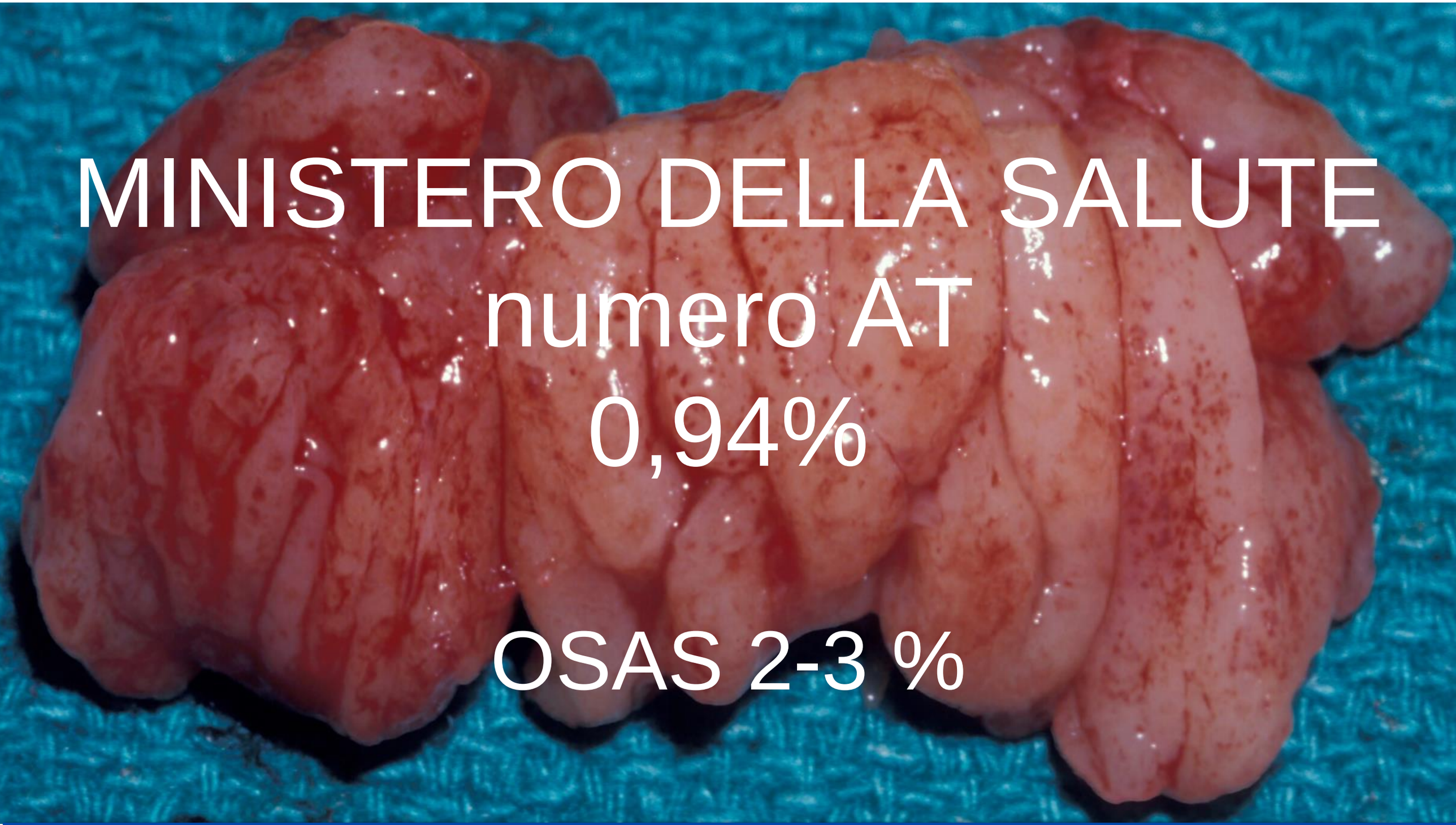


" ... mouth breathing, predisposition to colds, allergic diathesis, tuberculosis, to instability of the vagus-sympathetic-endocrine system, to liver, stomach, appendicular disorders, valgus knee, narrow thorax, shoulders drooping and dental irregularities ... mental instability, tendency to fatigue, bedwetting and poor progress at school ... "

"it is for a defensive reflex that the child opens his mouth to breathe and not for a bad habit "


6 C_I
7 $C_{II^{1/2}}$
8 C

COSA FARE ?

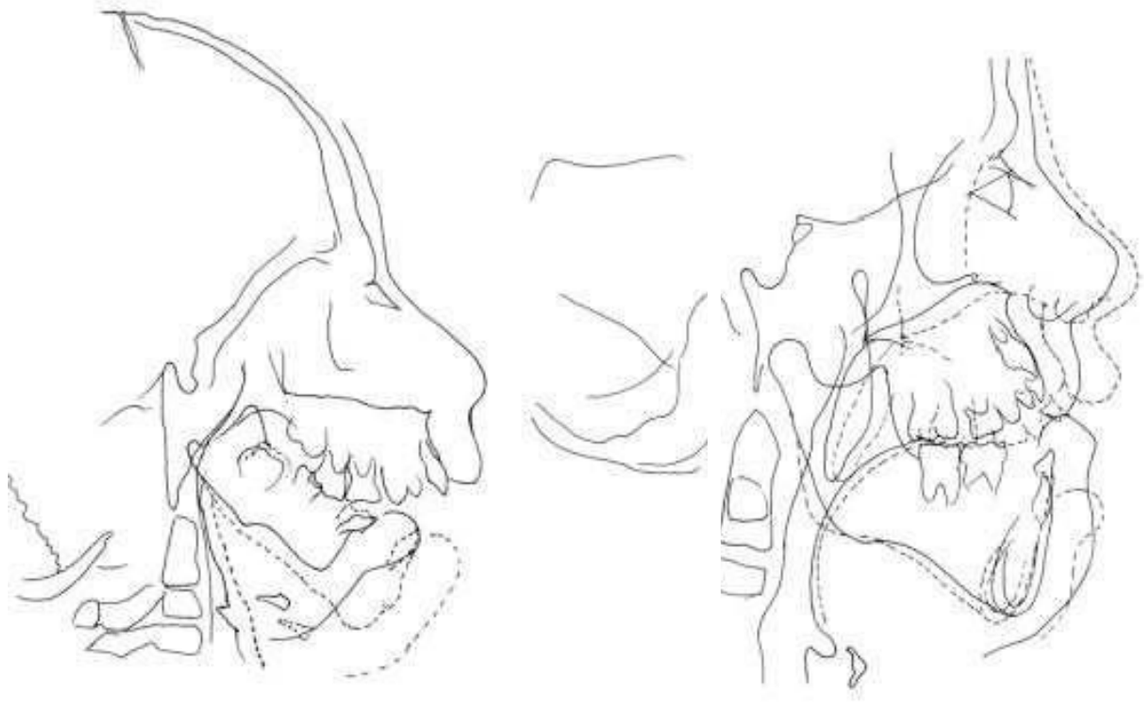


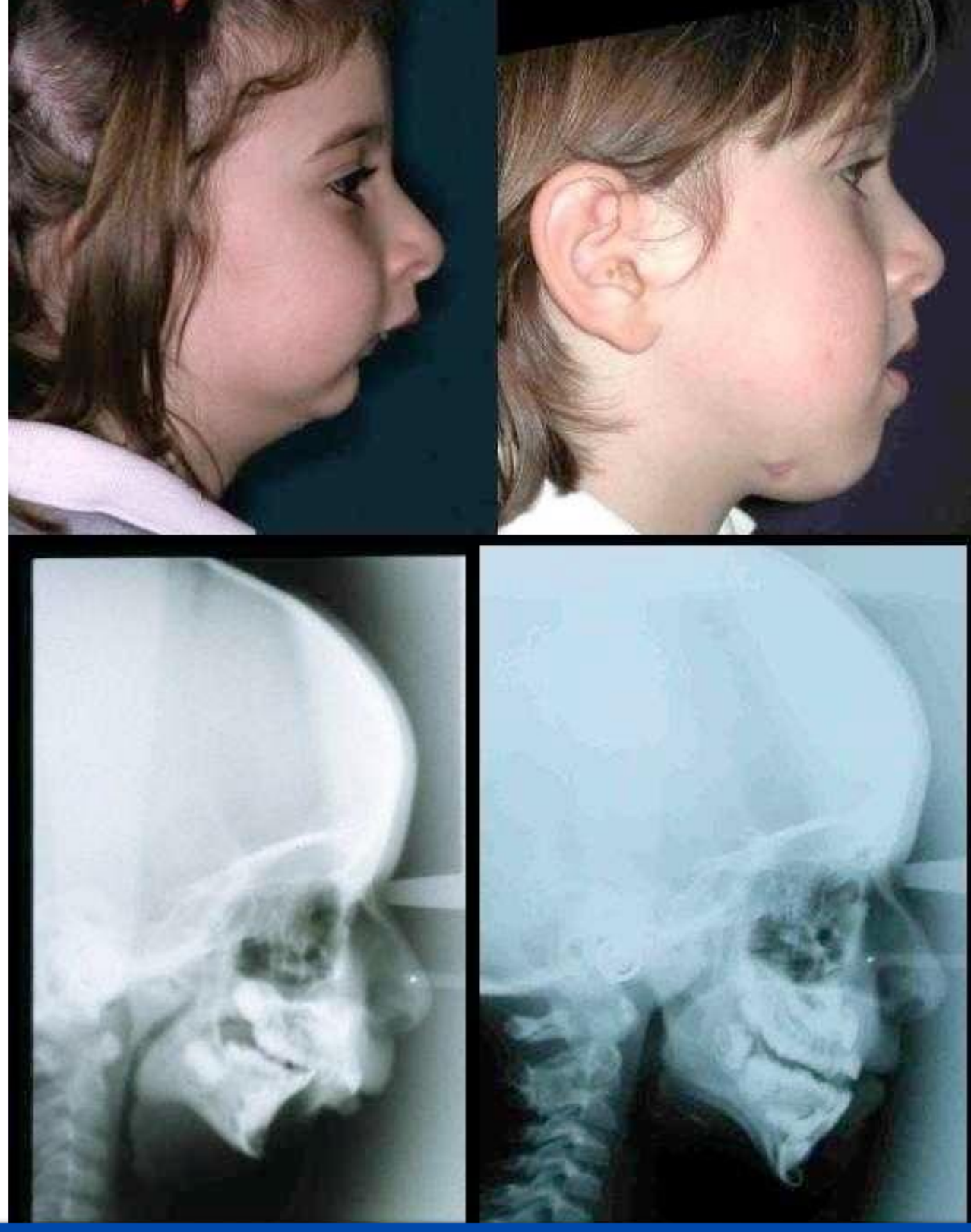
COSA FARE ?

STEROIDI SISTEMICI

“CHEMISTRY AT”

COSA FARE ?





COSA FARE ?

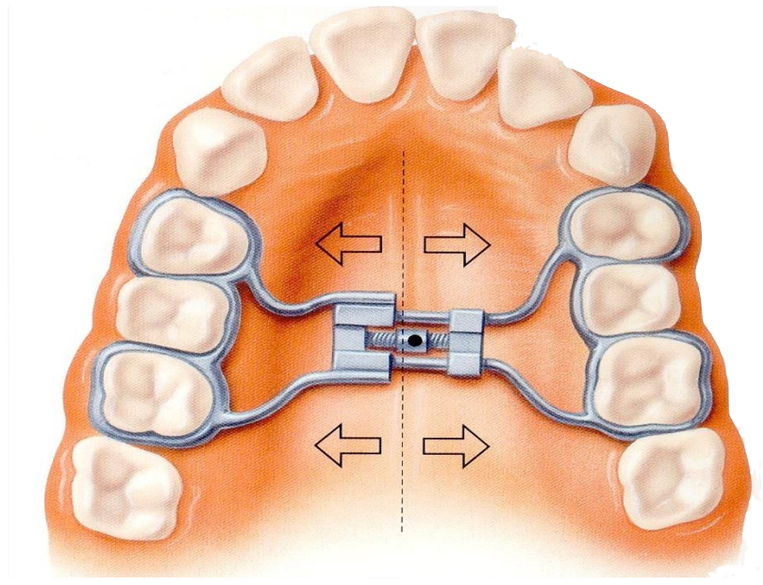
COSA FARE ?

Ministero della Salute

bambini con respirazione prevalentemente orale e mascellare superiore contratto traggono beneficio da espansione ortopedica del mascellare

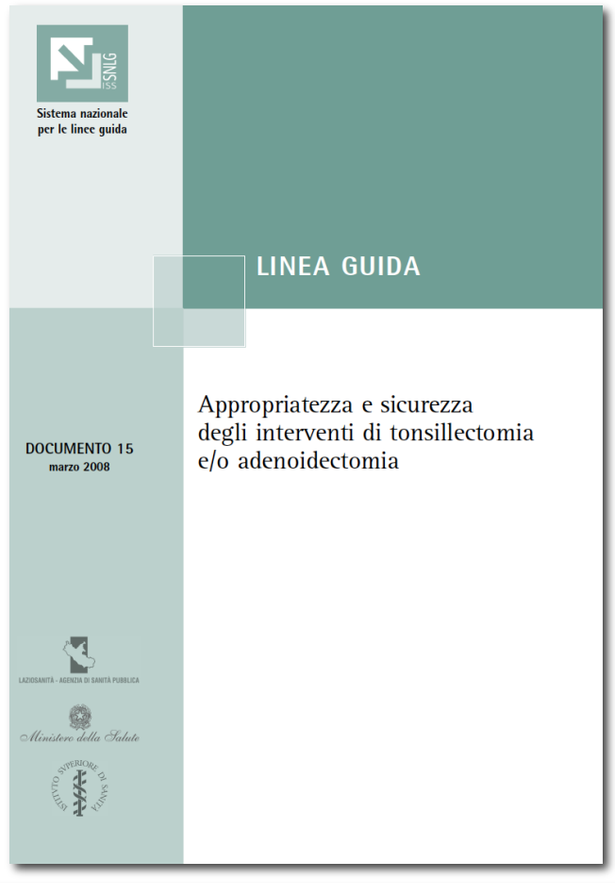
forza della raccomandazione A

evidenza scientifica 2



II/B **I bambini con OSAS e ipertrofia adenotonsillare, con sospetto di anomalie occlusali o altre anomalie cranio-facciali necessitano di valutazione ortodontica prima di procedere all'intervento di adenotonsillectomia.**

VI/B **L'intervento ortodontico deve essere considerato come opzione terapeutica prima o contestualmente al trattamento con CPAP.**



COSA FARE ?

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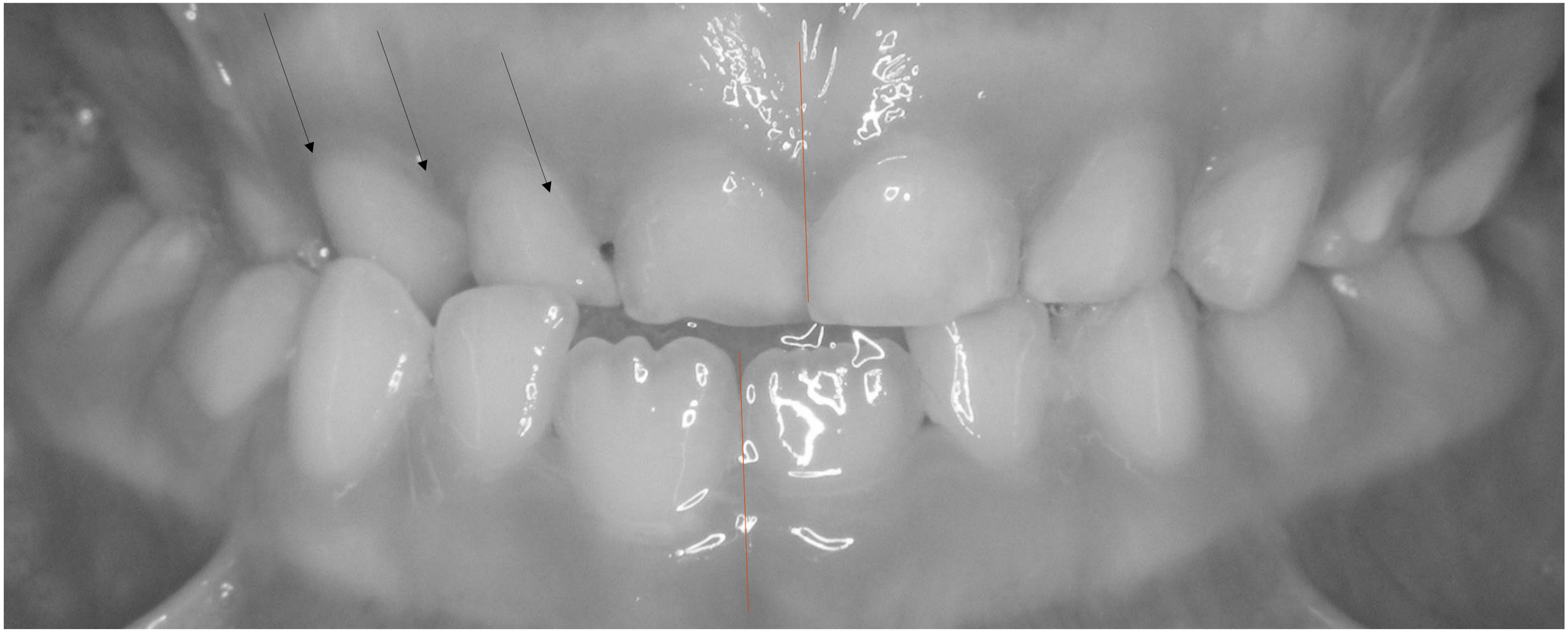

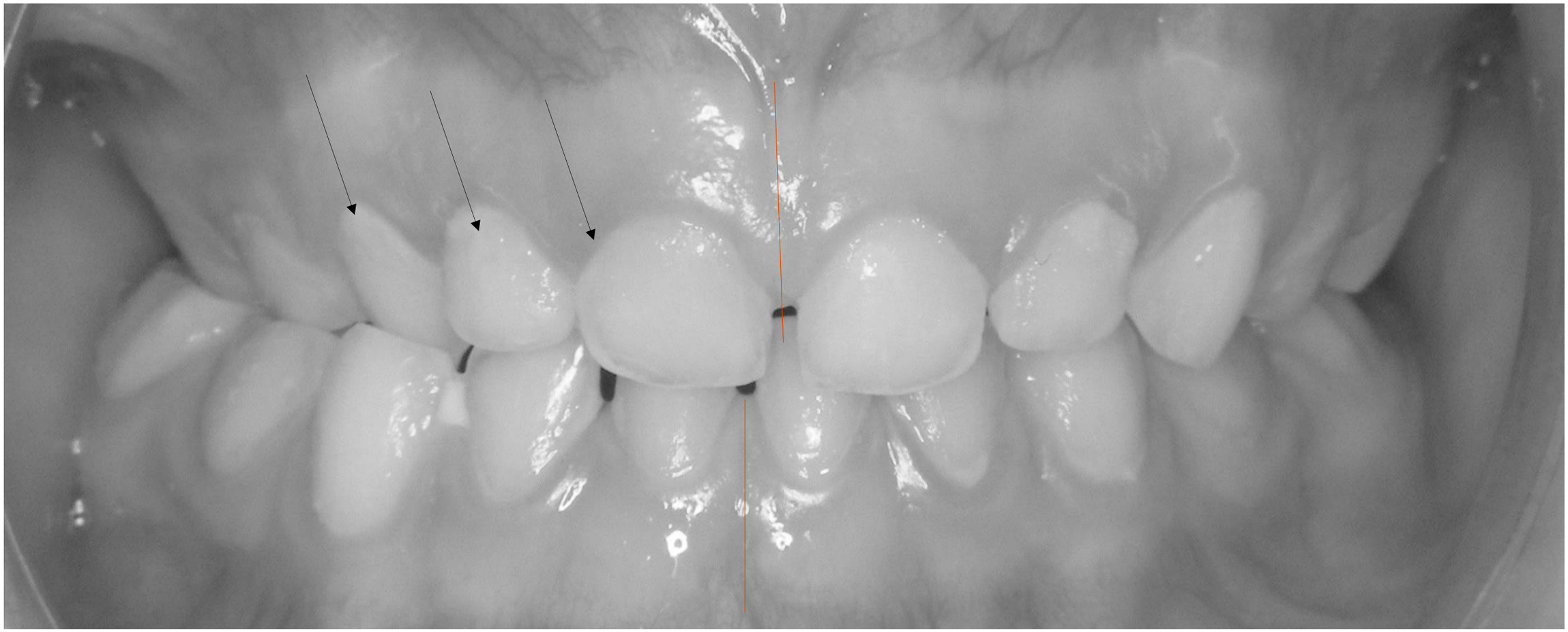

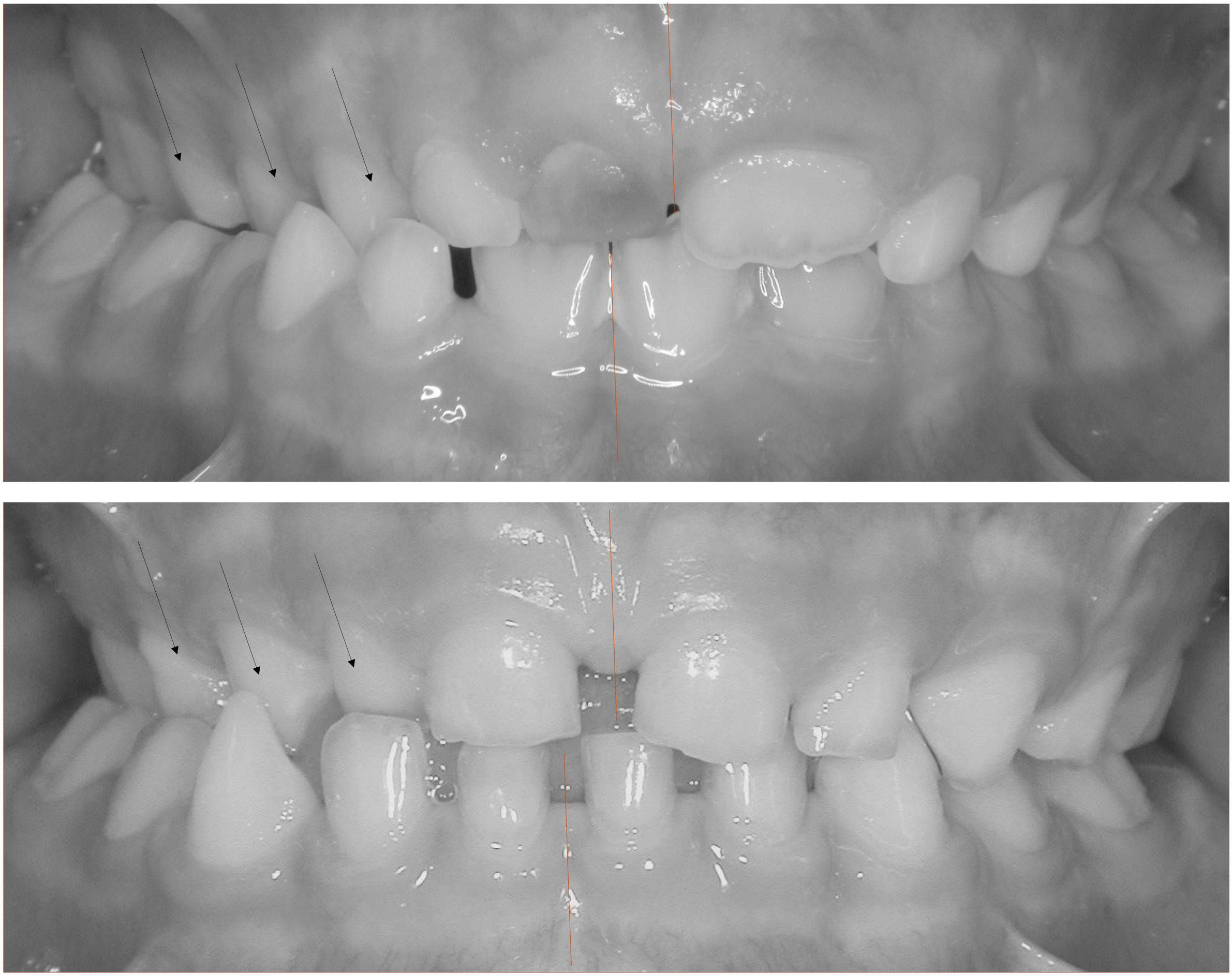

Unilateral Posterior Crossbite with Mandibular Shift: A Review

David B. Kennedy, BDS, LDS, MSD, FRCD(C), *Matthew Osepchook*, BSc, DDS

Contact Author

Dr. Kennedy
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ABSTRACT

Based on this literature review, early orthodontic treatment of unilateral posterior crossbites with mandibular shifts is recommended. Treatment success is high if it is started early. Evidence that crossbites are not self-correcting, have some association with temporomandibular disorders and cause skeletal, dental and muscle adaptation provides further rationale for early treatment. It can be difficult to treat unilateral crossbites in adults without a combination of orthodontics and surgery. The most appropriate timing of treatment occurs when the patient is in the late deciduous or early mixed dentition stage as expansion modalities are very successful in this age group and permanent incisors are given more space as a result of the expansion. Treatment of unilateral posterior crossbites generally involves symmetric expansion of the maxillary arch, removal of selective occlusal interferences and elimination of the mandibular functional shift. The general practitioner and pediatric dentist must be able to diagnose unilateral posterior crossbites successfully and provide treatment or referral to take advantage of the benefits of early treatment.

MeSH Key Words: malocclusion/diagnosis; malocclusion/therapy; orthodontic appliance design; palatal expansion techniques/instrumentation

© *J Can Dent Assoc* 2005; 71(8):569–73
This article has been peer reviewed.

Posterior crossbite is defined as any abnormal buccal–lingual relation between opposing molars, premolars or both in centric occlusion.[1] The reported incidence of posterior crossbites ranges from 7% to 23% of the population.[1–5] Higher incidence rates may result when an edge-to-edge transverse discrepancy is included in the definition of crossbite.[6] The most common form of posterior crossbite is a unilateral presentation with a functional shift of the mandible toward the crossbite side (FXB); it occurs in 80% to 97% of posterior crossbite cases.[5–7] The prevalence of FXB at the deciduous dentition stage is 8.4% and drops to 7.2% at the mixed dentition stage.[6] The frequency of spontaneous self-correction ranges from 0% to 9%.[5,6] Similarly, the spontaneous development of crossbite that was not present earlier is 7%.[5]

The etiology of posterior crossbite can include any combination of dental, skeletal and neuromuscular functional components. Allen and others[8] examined the skeletal contributions to posterior crossbites. Smaller maxillary to mandibular intermolar dental width ratio and greater lower face height were the 2 variables most often associated with posterior crossbite. A small maxilla to mandible width ratio may arise from genetic or environmental factors. Upper airway obstruction in the form of hypertrophied adenoids or tonsils and allergic rhinitis can result in mouth breathing and are correlated with the development of posterior crossbites.[9–11] Those who have been intubated during infancy also have a significantly higher prevalence of posterior crossbites.[12]

Non-nutritive sucking habits are associated with development of posterior crossbite. In 2- to 6-year-old American children, finger-sucking habits were significantly associated with posterior crossbite.[3] A large study of Scandinavian 3-year-old children compared previous or continuing finger and pacifier habits with crossbite.[13] Using logistic regression,

Clinical
PRACTICE

Unilateral Posterior Crossbite with Mandibular Shift: A Review

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Based on this literature review, early [illegible] unilateral posterior crossbites with mandibular shifts is recommended. Treatment success is high if it is started early. Evidence that crossbites are not self-correcting, have some association with temporomandibular disorders and cause skeletal, dental and muscle adaptation provides further rationale for early treatment. It can be difficult to treat unilateral crossbites in adults without a combination of orthodontics and surgery. The most appropriate timing of treatment occurs when the patient is in the late deciduous or early mixed dentition stage as expansion modalities are very successful in this age group and permanent incisors are given more space as a result of the expansion. Treatment of unilateral posterior crossbites generally involves symmetric expansion of the maxillary arch, removal of selective occlusal interferences and elimination of the mandibular functional shift. The general practitioner and pediatric dentist must be able to diagnose unilateral posterior crossbites successfully and provide treatment or referral to take advantage of the benefits of early treatment.

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23 per cento

causato da lingua “bassa”

respirazione orale -

succhietto (quale? ndr) -

frenulo linguale corto -

porta a

difetti di crescita di mascellare e mandibola -

disturbi respiratori -

affollamenti dentari -

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Abstract

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Ann Stomatol (Roma). 2015 Jul 28;6(2):53-7.

Craniofacial growth and respiration: a study on an animal model.

Levrini L[1], Mangano A[1], Ambrosoli A[1], Merlo P[1], Mangano C[2], Caprioglio A[1].

Author information

Abstract

AIMS: The aim of this study was to analyse the effects of nasal obliteration with regards to the linear dimensions of dissected hemimandibles of a homogeneous sample of young rats.

METHODS: 68 pure breed male Sprague-Dawley rats, aged four weeks, were divided into four groups of 17: two control groups and two test groups. The first control group was sacrificed at the beginning of the observation period and the other one at the end. The test groups, one of which had the right nostril occluded by silicon material while the other had the left occluded, were sacrificed after eight weeks, at twelve weeks. After isolating the hemi-mandibles, four vertical and four sagittal measurements were taken; comparison was then made between the control groups and the experimental groups. The sagittal measurements are articular surface of the condyle-neck incisor (SARCIN), articular surface of the condyle-mental foramen (SARFORO), articular surface of the condyle-margo incisalis (SARMI), articular surface of the condyle-surface mesial of the first molar (SARSMM). The vertical measurements are superior condyle surface-base (SCOSUB), mesial surface of the first molar-base (SUMESM), maximum inferior arched concavity-base, (XCOARIB), maximum sigmoid notch concavity-base (XCOINSB).

RESULTS: The sagittal and vertical measurements showed an increase in the values of the experimental group when compared to the controls.

CONCLUSION: An altered nasal respiration is able to influence the patterns of facial growth and in particular to induce an increase in the growth of the mandible.

KEYWORDS: craniofacial growth; growth patterns; orthodontics; respiration

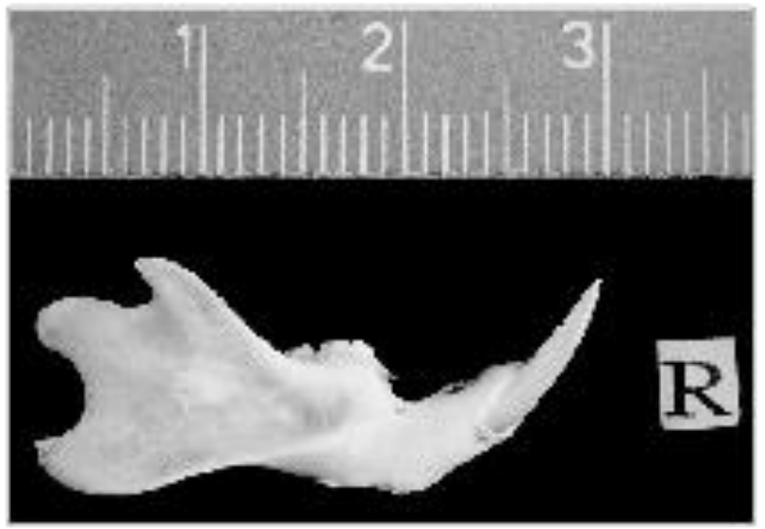


Figure 1. One of the sample analyzed.

Nostril occluded	Sacrifice time	Average weight
left	12 weeks	Gr 384 ± 23
right	12 weeks	Gr 395 ± 32
none	4 weeks	Gr 72 ± 19
none	12 weeks	Gr 388 ± 27

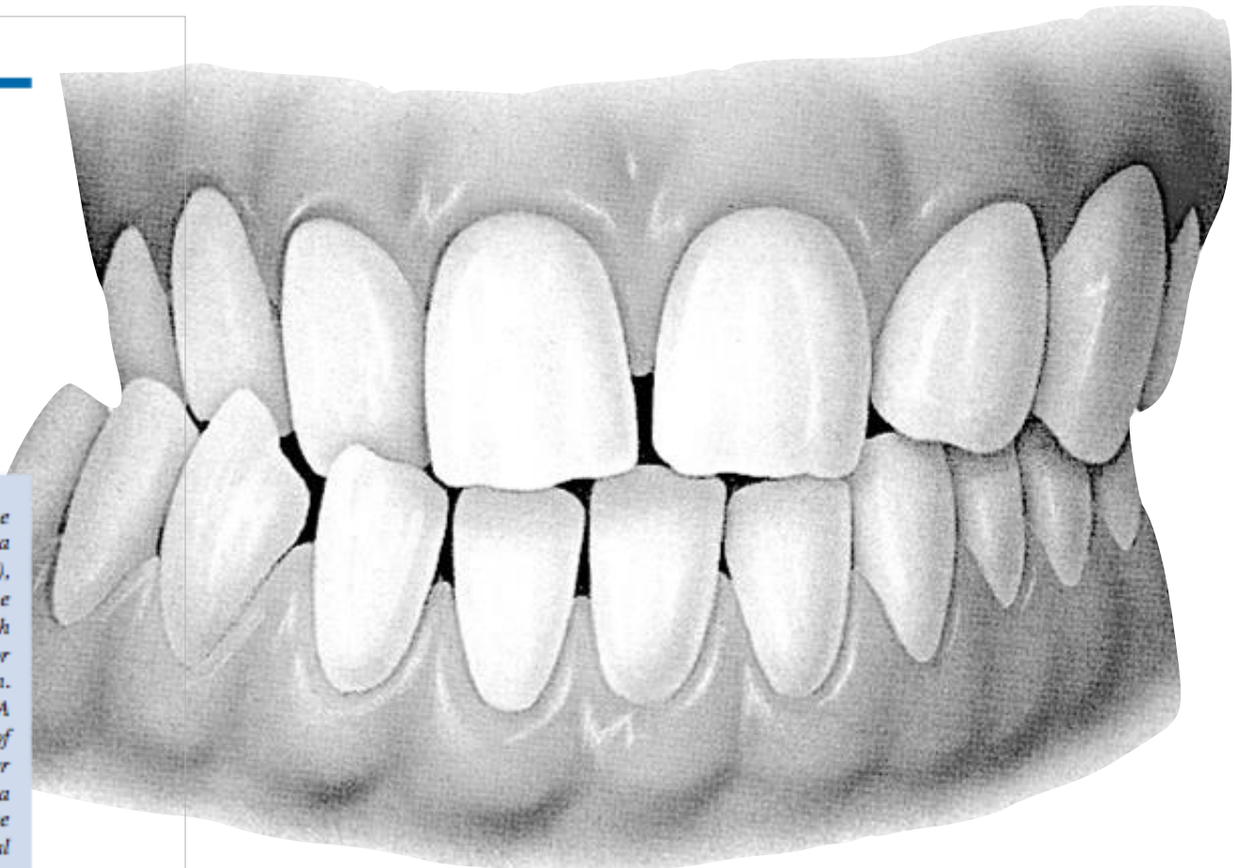
- GRUPPO A ostruzione 1 narice (34 ratti 28 giorni)
- GRUPPO B controllo sacrificato 28 giorno (17 ratti 28 giorni)
- GRUPPO C controllo sacrificato 12 settimane (17 ratti 28 giorni)

Different geometric patterns of pacifiers compared on the basis of finite element analysis

L. LEVRINI, P. MERLO, L. PARACCHINI

*ABSTRACT. **Aim** This study was carried out with the purpose to show on a virtual model of oral cavity the mechanical behaviour of different kinds of pacifiers with different pressure levels that can be likened to a condition of rest and deglutition. **Materials and methods** Three different types of dummies, orthodontic- (A), cherry- (B) and drop- (C) shaped from an anatomical point of view, were inserted between the palate and the tongue in a virtual system by means of a finite element simulation. The palatal structure was recreated through tridimensional laser scanning, while the tongue structure was reconstructed by a software suitable for reproducing solids. Also the image of the pacifiers was developed by computer-aided scanning and reproduction. Suitable constraints were inserted and high and low pressure levels were exerted on these systems. FEA simulation allowed us to distribute the strain on the palate according to the different geometrical structures of the objects. **Results** Dummy A shows a more uniform and wider crosswise stress distribution with also a lesser load on the anterior palatal crest. Dummy B and C, on the contrary, show a more dot-like behaviour inducing a higher stress due to contact on restricted points. **Conclusion** The characteristics of dummy A, although they have not been clinically investigated yet, seem to be the fittest ones to guarantee the maintenance of the transversal diameters of the premaxilla and reduce the risk of open bite.*

KEYWORDS: Pacifiers, Finite Element Analysis, Maxilla.



Introduction

The ability to suck represents the first coordinated muscular activity in the newborn baby. There are two forms of suction: the nutritive sucking, thanks to which the infant is nourished, and the non-nutritive one that gives the baby a feeling of peacefulness and safety. The non-nutritional suction consists in the habit of sucking the thumb and, even more often, a dummy.

The use of pacifier has increased more and more over the years and just its being widespread makes it a useful and much-discussed object. Since the first models appeared on the market up to now, many changes have been made in terms of size, geometry and production materials. With time new specific shapes have been designed, dimensions have been increasingly adapted to the baby's age and materials such as caoutchou, or natural rubber, and silicone have been selected for production. The role of the pacifier has been scientifically studied over and over and not always with coherent outcomes. Several studies show, from an orthodontic point of view, how the early use of dummy does not affect the physiological development of the arches. In a study on 289 patients [Larsson, 1983] no significant differences were highlighted in the distribution of posterior cross bite between groups of babies used to thumb- or pacifier sucking and non-suckers. The same result was confirmed by a literature review [Farsi et al., 1997] aimed at pointing out the effects of pacifier use on primary dentition. In this case only a prevalence of open bite and not of cross bite could be found out in the suckers' group. Conversely, an other research [Larsson, 1986] shows a prevalence of cross bite in 40 three-year-old children used to pacifier sucking, though with an unusual and different distribution according to sex. Similarly controversial results were achieved in further researches aimed at analysing the possible correlation between the use of dummy and the onset of malocclusions [Larsson, 1998] [Turgeon-

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Eur J Paediatr Dent. 2007 Dec;8(4):173-8.

Different geometric patterns of pacifiers compared on the basis of finite element analysis.

Levrini L[1], Merlo P, Paracchini L.

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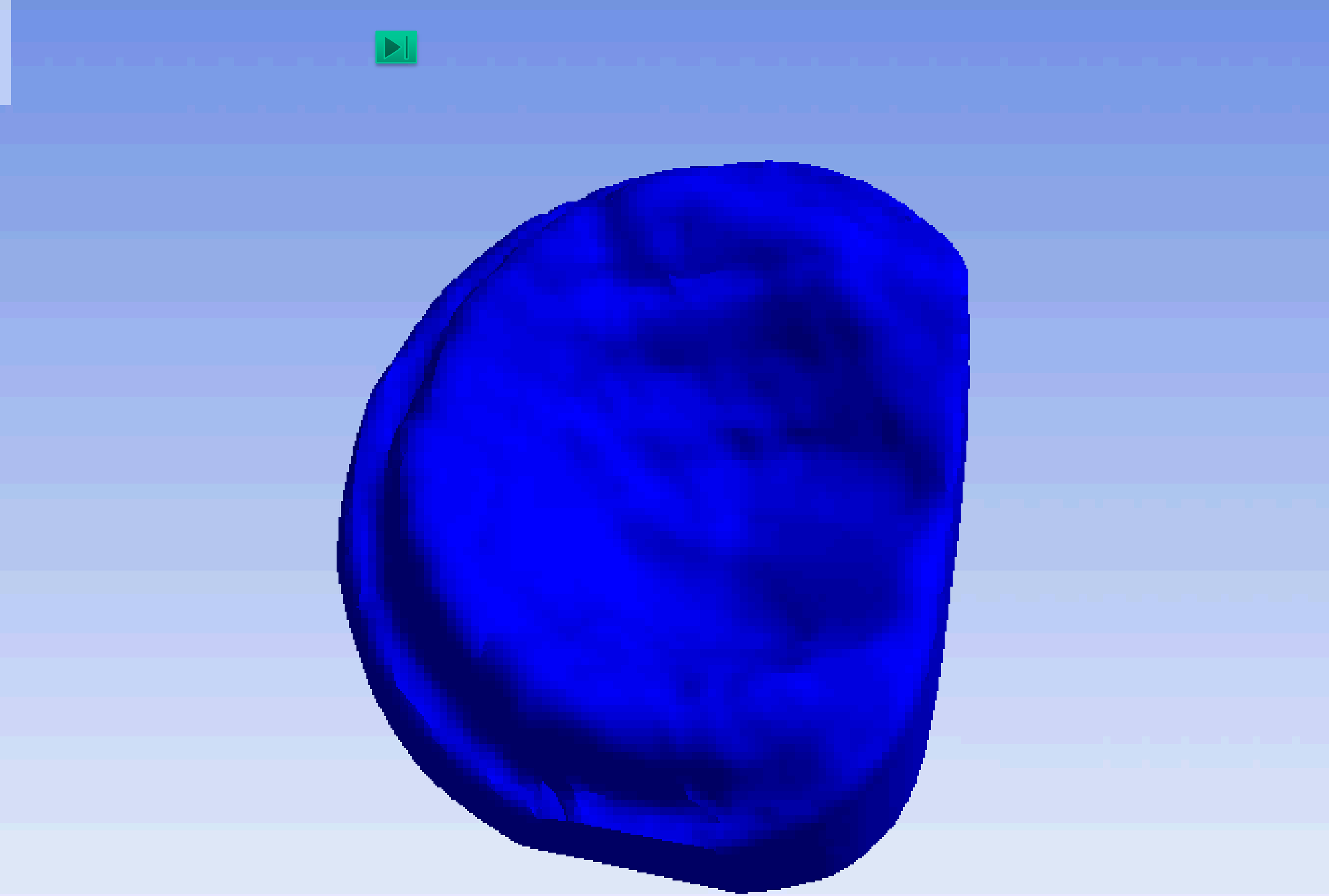

anatomico
funzionale

simmetrico
passivo

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LUCA LEVRINI

SUZIONE E RESPIRO: SVILUPPO E INTERRELAZIONI

Sleep Breath
DOI 10.1007/s11325-012-0712-4

REVIEW

Updates in oral appliance therapy for snoring and obstructive sleep apnea

Hui Chen · Alan A. Lowe

Received: 27 January 2012 / Revised: 27 January 2012 / Accepted: 16 April 2012
© Springer-Verlag 2012

Abstract
Background Obstructive sleep apnea (OSA) is increasingly being recognized by the public due to its life-threatening and low curability rate nature. Oral appliances (OAs) were introduced as a treatment option for both non-apneic snoring and OSA to maintain the patency of the upper airway during sleep by repositioning the mandible, tongue, and soft palate.
Results Over the past decade, OAs are enthusiastically studied and concluded as a simple, silent, bed partner-friendly, less invasive, tolerable, and efficacious choice for mild-to-moderate OSA. In the meantime, some challenges remain uncertain such as titration management, 3D image diagnostic tools reliability, and long-term adherence for adult patients. Improvement of temporomandibular joint (TMJ) monitoring and management is recommended, although there is no scientific evidence suggesting consistent undesirable long-term effects of OA on the TMJ. Now that pediatric OSA is being diagnosed more frequently, OA therapy is becoming a promising option for children as well.
Conclusion Consistent follow-up and management are needed to increase clinical success rates in OA therapy for OSA. Further educational preparation and support is required for dental and medical professionals to recognize OSA and ensure the best possible patient care.

Keywords Obstructive sleep apnea · Oral appliance therapy · Mandibular advancement · Snoring · Titration · Side effects · Compliance · Adherence · Efficacy

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Introduction

Obstructive sleep apnea (OSA) is characterized by repetitive episodes of upper airway obstruction that occur during sleep, usually associated with a reduction in blood oxygen saturation, loud snoring, witnessed breathing interruptions, and/or arousal due to gasping or choking in the presence of obstructive respiratory events [1]. OSA is associated with significant co-morbidities such as cardiovascular, metabolic/neurocognitive complications, motor vehicle crashes, and occupational accidents. In population-based epidemiology studies, the prevalence of OSA is different depending upon the age, gender, obesity, ethnicity, severity, and investigation methodology [2]. The American National Sleep Foundation 2005 poll based on Berlin questionnaire scores indicated the prevalence of OSA ranged from 16% to 37% in the 18–65+ age groups with the 50–64-year-old group having the greatest chance of being diagnosed with the disease in both gender groups (37% in males and 29% in females) [3].

Currently, the in-laboratory polysomnography (PSG) is used as a standard to diagnose OSA [4]. The severity of OSA is differentiated based on Apnea Hypopnea Index (AHI), which is the average number of apneas and hypopneas per hour of sleep. Since each apnea event differs in duration (some last for 10 s while others a minute long), the number of events may not be better than the total time of air blockage hourly in order to demonstrate the true severity of OSA.

Behavioral modifications for OSA treatment include weight loss, alcohol avoidance, and changes in sleeping position. If these conservative management practices do not solve the problem, then therapeutic interventions such as continuous positive airway pressure (CPAP), oral appliances (OAs), and/or a range of surgical procedures can be

"OA (ORAL APPLIANCE) THERAPY IS BECOMING A PROMISING OPTION FOR CHILDREN AS WELL"

Pediatric Pulmonology 33:368–373 (2002)

Effect of Pacifier Use on Oral Breathing in Healthy Newborn Infants

Francesco Cozzi, MD, Francesco Morini, MD, Claudio Tozzi, MD, Enea Bonci, MSc, and Denis A. Cozzi, MD*

Summary. We tested the hypothesis that the use of a pacifier may affect the ability of some term infants to maintain effective oral breathing during prolonged nasal occlusion. Three nasal occlusion tests without a pacifier and 3 with a pacifier were alternately carried out in 20 healthy term infants (age 2–5 days). Once the infant commenced oral breathing, nasal occlusion was continued for up to 90 sec (prolonged nasal occlusion), provided the infant did not start crying and that arterial oxygen saturation (SaO_2) did not drop to ≤ 80%. The response to nasal occlusion was considered maladaptive if oral breathing was accomplished with signs of upper airway obstruction.

After nasal occlusion, the infants succeeded in starting oral breathing in all instances after a delay which was strongly correlated to the drop in SaO_2 ($P < 0.001$). Once the infants commenced oral breathing, 17/20 infants presented a maladaptive response to 62% of all tests without pacifier, whereas 10/20 infants presented a maladaptive response to 30% of all tests with a pacifier in place ($P < 0.001$). Following prolonged nasal occlusion, 18 of 19 infants presented a maladaptive response to 84% of all tests without pacifier, whereas 12 of 19 infants presented a maladaptive response to 41% of all tests with a pacifier in place ($P < 0.001$). Thus, after prolonged nasal occlusion with or without pacifier, the drop in mean SaO_2 from baseline values changed in accordance with an appropriate and maladaptive response (-4 ± 1 vs. -7 ± 1; $P < 0.001$).

We conclude that normal term infants often present with a maladaptive response to prolonged nasal occlusion. The use of a pacifier enhances the infant's ability to maintain a more adequate oral air flow. **Pediatr Pulmonol. 2002; 33:368–373.** © 2002 Wiley-Liss, Inc.

Key words: dummy; pacifier; hypoxemia; mouth breathing; nasal occlusion; obligatory nasal breathing; sleep apnea; upper airway resistance; upper airway obstruction; SIDS.

INTRODUCTION

The established view that newborn infants are unable to open their mouths and start oral breathing when nasally obstructed was recently challenged.[1–3] In fact, nearly all normal term and preterm infants are able to switch from nasal to mouth breathing if acute nasal occlusion is sustained before the occlusion reaches 30 sec.[1,3] The main implications of these findings are that infants should not be considered obligatory nasal breathers, and that nasal occlusion may not play a pathogenic role in sudden infant death syndrome (SIDS).[1,3]

However, clinical and respiratory studies indicate that infants with nasal obstruction due to choanal atresia/stenosis present with respiratory difficulties because of an increase of oral airway resistance.[4,5] The ensuing inspiratory efforts produce increased negative intrathoracic and oral pressures, which can suck the tongue backwards to such an extent that complete upper airway obstruction may result, with sealing of the tongue to the palate. In this situation, the infant with choanal atresia is usually able to reestablish a patent oropharyngeal airway by crying. If the response to this vacuum-glossoptotic apnea is inadequate, asphyxial death may occur. Therefore, not the inability to switch to oral breathing but rather the inability to maintain an adequate oral airway may play a role in the pathogenesis of SIDS.[4,6]

In infants with choanal atresia/stenosis, vacuum-glossoptotic apnea is usually prevented by introducing an oropharyngeal airway or an orogastric tube. Interestingly, a simple nipple with a large hole in its tip,[7,8] or even thumb sucking,[8] may serve this purpose. Based on these clinical observations, Cozzi et al.[6] suggested that the use of a pacifier, serving as an oral airway, may be a preventive measure against SIDS. This hypothesis was recently tested with a case-control study. Mitchell et al.[9] found that in New Zealand, pacifier use was significantly less frequent in infants who died from SIDS than in

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TABLE 1— Correlation Between Time to First Breath and Drop in Oxygen Saturation After Acute Nasal Obstruction Either Without or With a Pacifier

	No. of tests		Time (sec)		ΔSaO_2[1]	
Time (sec)	Without	With	Without[2]	With[2]	Without[2]	With[2]
≤ 10	22	7	7 ± 0	8 ± 1	−2 ± 0[3]	−2 ± 1[4]
11–15	32	12	13 ± 1	13 ± 0	−5 ± 1[3]	−4 ± 0[4]
≥ 16	6	28	19 ± 1	23 ± 1	−6 ± 2[3]	−6 ± 0[4]

[1] $\Delta SaO_2 = SaO_2$ postapnea − SaO_2 baseline.
[2] Values are means ± SE.
[3] $r = 0.49$ ($P < 0.001$).
[4] $r = 0.62$ ($P < 0.001$).

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REGULAR ARTICLE

Effect of pacifier use on mandibular position in preterm infants

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Abstract

Aim: It has been hypothesized that the association of pacifier use with reduced risk of sudden infant death is mediated by forward movement of the mandible and tongue that helps open the upper airway. Our aim was to examine whether the mandible is moved forward when an infant is sucking on a pacifier, and if so, whether the mandible remains advanced after the pacifier is removed.

Methods: In sixty clinically stable premature infants (corrected gestation age 36.5 ± 0.3 weeks, mean ± SEM) the distance from each ear where the pinna met the cheek to the most prominent point of the chin was measured bilaterally, and the average was used as an index of mandibular position. Mandibular position was determined before and after allowing the infants to suck on a pacifier for 10–15 min, and after removing the pacifier.

Results: There was a significant forward movement of the mandible when the infants were sucking on the pacifier (59.5 ± 0.7 vs. 58.6 ± 0.7 mm, p = 0.001), with no significant change after the pacifier was removed.

Conclusions: Pacifier use in preterm infants was associated with a small significant forward displacement of the jaw. These data suggest that pacifier use may help protect the upper airway.

INTRODUCTION

There is now strong evidence that pacifier (dummy) use is associated with a reduced risk of sudden infant death syndrome (SIDS) after adjustment for potential confounding factors (1–4). The effect is substantial and highly consistent across countries and over time (1,2). For example, a recent systematic meta-analysis found an unadjusted odds ratio of 0.48 (95% CI 0.43–0.054) for death at the last sleep (2). A subsequent report suggested that even larger reductions may be possible (OR 0.08), and that pacifier use was associated with a reduction in the risk associated with known SIDS risk factors (3). The underlying mechanisms of this protective effect are unknown. Potentially, the bulky external handle might help prevent the face being covered closely by soft bedding, or from turning straight down in prone sleep, or regular sucking might enhance the development of neural pathways controlling the upper airway (5). Another, long-standing hypothesis is that sucking on a pacifier may help protect the infant's upper airway (6).

Tonkin proposed in 1975 that a common pathogenic mechanism of SIDS was airway occlusion by backward displacement of the tongue and mandible (7), favoured by muscle relaxation during sleep and the marked mobility of the jaw of the premature or young-term newborn (8). Cozzi and colleagues expanded this hypothesis in 1979, suggesting for the first time that pacifiers might protect infants from SIDS, by keeping the oral airway open, thus preventing a pharyngeal vacuum and the consequent sealing of the airway (6). Subsequently, they proposed that pacifiers may provide an oral airway if the nasal airway is obstructed (9), or may stimulate reflex enhancement of genioglossus activity that would help to maintain the patency of the nasopharyngeal airway (10).

Although there is no direct evidence for this hypothesis, there is now considerable evidence that movement of the jaw has important effects on oxygenation, especially in premature infants. For example, flexion of the head on the neck leads to posterior displacement of the jaw, such that the tongue impinges on the posterior pharyngeal wall (11), obstructing the upper airway (12). Similarly, a recent study has shown that head flexion in premature babies restrained in infant car seats was associated with marked narrowing of the upper airway and increased episodes of oxygen desaturation (13). Further, in older infants a smaller jaw is associated with increased risk of apparent life-threatening events (14,15); data from timed lateral neck radiographs suggest that this association is mediated by narrowing of the upper airway (15). Finally, pacifier use can improve oral airflow and arterial oxygenation during prolonged nasal occlusion (9).

Thus it could be that pacifiers help to preserve or increase the oropharyngeal airway in sleep if the mandible comes under pressure from the front—such as in prone sleeping. However, the pacifier falls out shortly after most babies fall asleep, and thus it has been suggested that any effect of pacifiers must be either indirectly mediated or transient (16). In the present study we examined two questions: first, does the mandible move forward when the infant is sucking on a pacifier? Second, if so, does the mandible remain advanced when the pacifier is removed?

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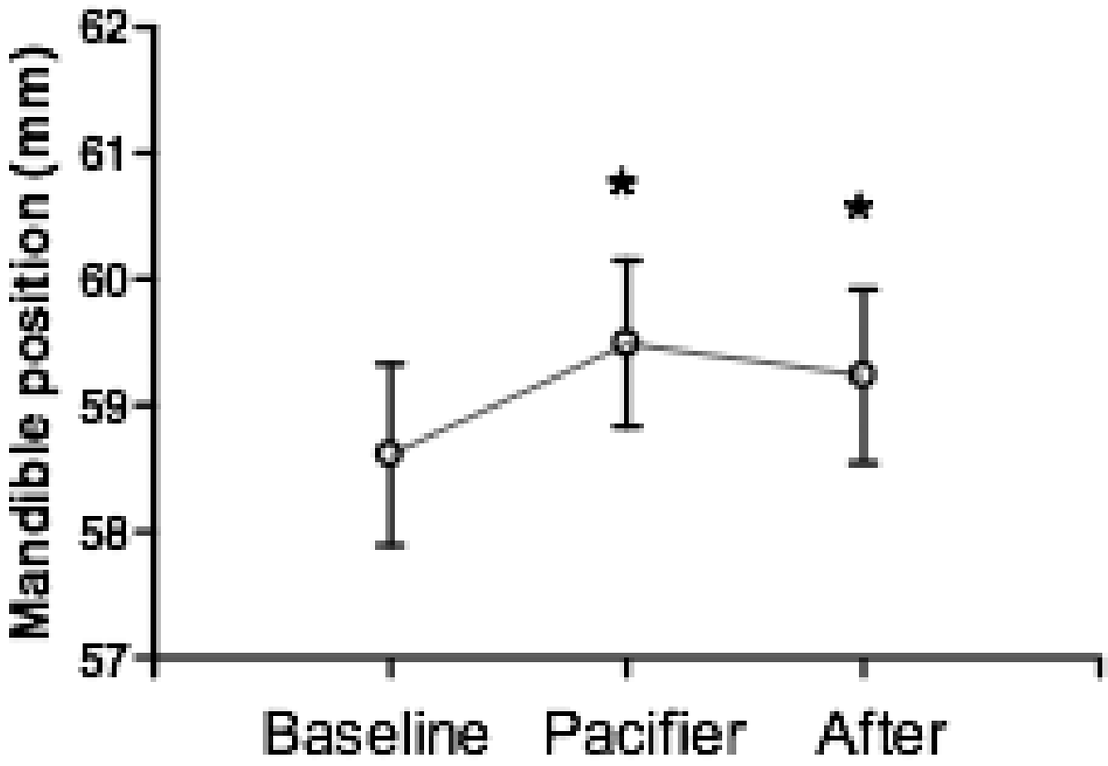

doi:10.1111/j.1440-1754.2007.01259.x

CASE NOTE

Upper airway size while sucking on a pacifier in an infant with micrognathia

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Abstract: In an infant with micrognathia, who was being evaluated after an apparent life-threatening event, respiration timed lateral radiographs showed an increase in the width of the middle airway space during inspiration from 2 mm without the pacifier to 9 mm while sucking on a pacifier. This observation is consistent with the hypothesis that the well-documented association between the pacifier use and reduced risk of sudden infant death syndrome may be at least in part related to changes in airway size.

Key words: apparent life-threatening events (ALTE); upper airways obstruction; pacifier; middle airway space.

Infants with micrognathia whether isolated or as part of the Pierre Robin sequence have varying degrees of upper airway insufficiency ranging from no apparent compromise in the neonatal period to such severe airway compromise that intubation is needed at the time of birth. Even mild micrognathia is associated with an increased risk of apparent life-threatening events (ALTE);[1] data from respiration timed lateral head and neck radiographs suggest that this is mediated by narrowing of the upper airway.[1]

There is now strong evidence that pacifier (dummy) use is associated with reduced risk of sudden infant death syndrome (SIDS) after adjustment for potential confounding factors.[2–5] The effect is substantial and highly consistent across countries and over time.[3] For example, a recent systematic meta-analysis found an unadjusted odds ratio of 0.48 (95% confidence interval, 0.43–0.054) for death at the last sleep.[3] A subsequent report suggested that even larger reductions may be possible (odds ratio 0.08), and that pacifier use alleviated the risk associated with known risk factors.[4] The underlying mechanisms of this protective effect are unknown. It may be related to indirect changes such as the reported reduced threshold for arousal after sucking on a pacifier.[5] Alternatively, as first proposed by Cozzi *et al.* in 1979, sucking on a pacifier may be associated with forward movement of the tongue that would help to open the upper airway and thus protect infants from SIDS.[2]

We report a case in which by serendipity we were able to examine the effect of sucking on a pacifier on the size of the upper airway.

Key Points

1. Pacifier use is associated with reduced risk of cot death, but the mechanism is unknown.
2. Timed lateral radiographs are valuable for evaluating upper airway dimensions.
3. Sucking on a pacifier was associated with increased upper airway size.

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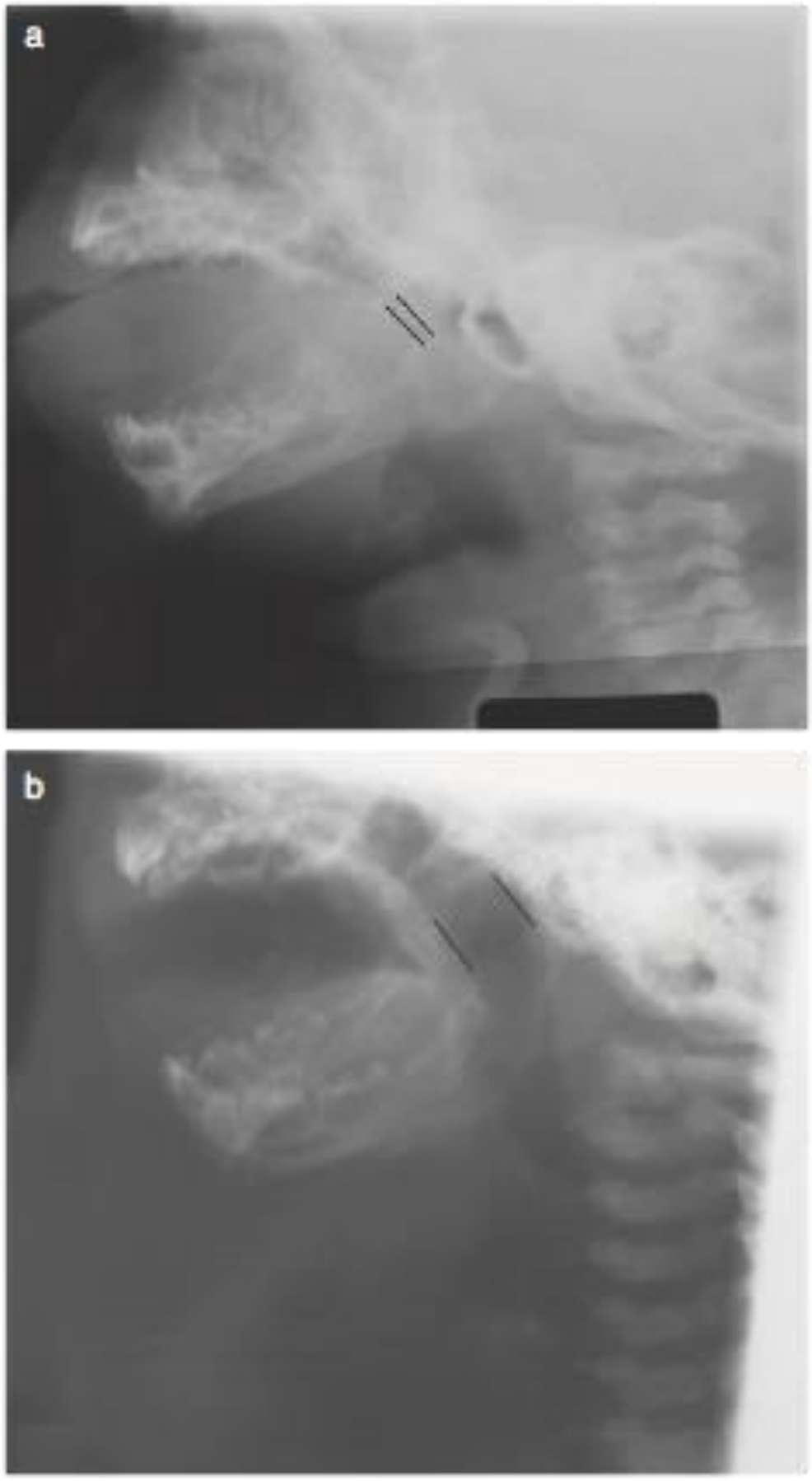
Case history

This baby boy was born after a normal pregnancy and delivery, with normal Apgar scores (9 at 5 min), at term weighing 3.5 kg. His mother was a non-smoker, and he was usually slept on his side. At 10 weeks of age, the infant was found cyanosed and apparently not breathing by his mother while sleeping in his cradle. His mother picked him up and shook him. He rapidly started breathing and his colour returned to normal. The infant was evaluated in hospital, and clinical micrognathia was noted, with intermittent paradoxical breathing. No other abnormality was found on examination. In view of the association of micrognathia with narrowed airways,[1] respiration timed lateral radiographs were obtained in inspiration (and expiration, not shown) to determine the airway size.[6] The exposures were timed by the use of a modified Graseby MR 10-apnoea monitor (Graseby Dynamics Limited, Herts, UK), with the capsule of the monitor taped to the infant's lateral abdomen at the level of the umbilicus as previously reported.[1] The first film shows a narrow middle airway space (Fig. 1a). The baby began to cry, and therefore his mother placed a pacifier in his mouth. The infant's paradoxical breathing was clinically alleviated with the pacifier. The second film with the pacifier in place showed an impressively improved airway. The mandible moved forwards by 3 mm (Fig. 1b), and measured on a line between the posterior sella turcica and gnathion[1] the upper airway was 2 mm wide during inspiration without the pacifier, and 9 mm wide while the pacifier was being sucked on. His mother agreed to presentation of these observations.



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Pre-Fabricated Myofunctional Appliance for the Treatment of Mild to Moderate Pediatric Obstructive Sleep Apnea: A Preliminary Report

Luca Levrini*/ Giussepa Sara Salone**/ German O Ramirez-Yanez***

Objective: *The purpose of this study was to determine the efficacy of the Myobrace/MyOSA myofunctional appliance for the treatment of mild to moderate Obstructive Sleep Apnea (OSA) in children, by means of the Apnea/Hypopnea Index (AHI).* ***Study design:*** *Nine children with a diagnosis of mild to moderate OSA were included in the study. The subjects wore the Myobrace/MyOSA myofunctional appliance for a period of 90 days. The initial AHI, determined by means of a sleep test, was used as baseline (To), and a second AHI, computed at the end of the experimental period, was used as final data (T_1). The differences between the AHIs at To and T_1 were calculated (diff AHI) and used for statistical purposes. The level of Oxygen Saturation (SaO_2) was also recorded before and after treatment, and their differences calculated as diff SaO_2. Statistical analysis was performed with a paired-t- test and statistical significance was established at 95 per cent level of confidence.* ***Results:*** *A statistical significant reduction in the AHI of the studied subjects was computed at the end of the experimental period ($p = 0.0425$). Although there was an improvement in the SaO_2, it did not reach a statistically significant difference.* ***Conclusions:*** *The present results suggest that the Myobrace/ MyOSA myofunctional appliance can be an alternative to treat mild to moderate OSA in children. However further studies are necessary to determine the stability of the results after treatment.*

Keywords: *Obstructive Sleep Apnea, Myofunctional, Apnea, Myobrace/MyOSA.*

INTRODUCTION

Obstructive Sleep Apnea (OSA) in children is a disorder of breathing during sleep, characterized by prolonged partial upper airway obstruction and/or intermittent complete obstruction that disrupts ventilation during sleep and fragments sleep patterns [1]. Its incidence is between 1.2 to 5.7 percent of the general pediatric population and, it can produce neuro-psychological and cognitive impairment in the child, as well as systemic and pulmonary hypertension and endothelial dysfunction [2-5]. OSA in children is generally accompanied by nocturnal snoring and sleep disorders, as well as by a neuropsychological deficit in the child's cognitive potential [1,6,7].

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Pediatric OSA is diagnosed by means of a sleep study (Polysonography, PSG), which is generally performed at the hospital with the child staying there overnight or, performed at home with a portable device (known as Home Sleep Test, HST). Although a hospital based PSG is the optimal test to accurately diagnose pediatric OSA, the American Academy of Pediatrics have recommended that all children should be screened for OSA and, that HST could be prescribed in cases where hospital PSG is not available or not easily scheduled [1]. In that context, a sleep test (PSG or HST) is necessary to determine if a child is suffering of OSA by means of establishing the Apnea and Hypopnea Index (AHI). In children, an AHI lower than 1 is considered normal; between 1 and less than 5 is diagnosed as mild OSA; between 5 and less than 10 is considered moderate OSA; and, AHI higher than 10 is classified as severe OSA [8].

As OSA during childhood has been correlated with an overgrowth of the tonsils and adenoids, surgical removal of that lymphoid tissue has been proposed as the first line of treatment. Although the surgery has been reported to significantly reduce the signs and symptoms associated with pediatric OSA, it may not fully resolve the OSA and a significant number may require additional therapy [9,10]. Based on recent reports stating that pediatric OSA is associated with disturbances in craniofacial growth and development in

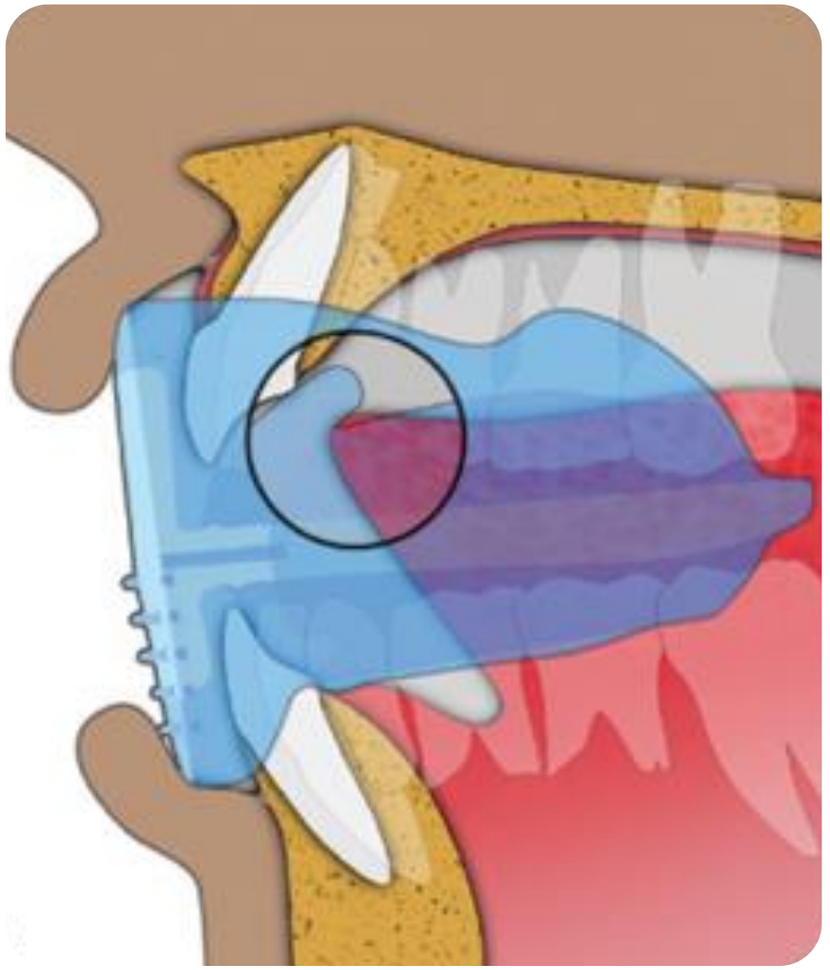

Table 1. Results recorded for the nine patients included in the study. (AHI) Apnea/Hypopnea Index; SaO_2 Oxygen Saturation.

Patient	AHI_0	AHI_1	diff AHI To	% SaO_2 To	% SaO_2 T_1	Diff % SaO^2
1	1,6	0	+ 1,6	96,8	96	+ 0,8
2	1,8	1	+ 0,8	95	97,7	- 2,7
3	1,8	0,8	+ 1	93,6	95	- 1,4
4	2,4	0,2	+ 2,2	97	96,6	+ 0,4
5	3,7	1,1	+ 2,6	91	96,3	- 5,3
6	2,7	0,6	+ 2,1	93	94,6	- 1,6
7	4,7	0,3	+ 4,4	95	96	- 1
8	8,4	2,2	+ 6,2	94	93,7	+ 0,3
9	1,8	0,1	+ 1,7	93,4	95,2	- 1,8

SLEEP APNEA IN THE FIRST TWO YEARS OF LIFE: ASSESSMENT OF THE EFFECT OF SOOTHER IN PATIENTS WITH ALTE

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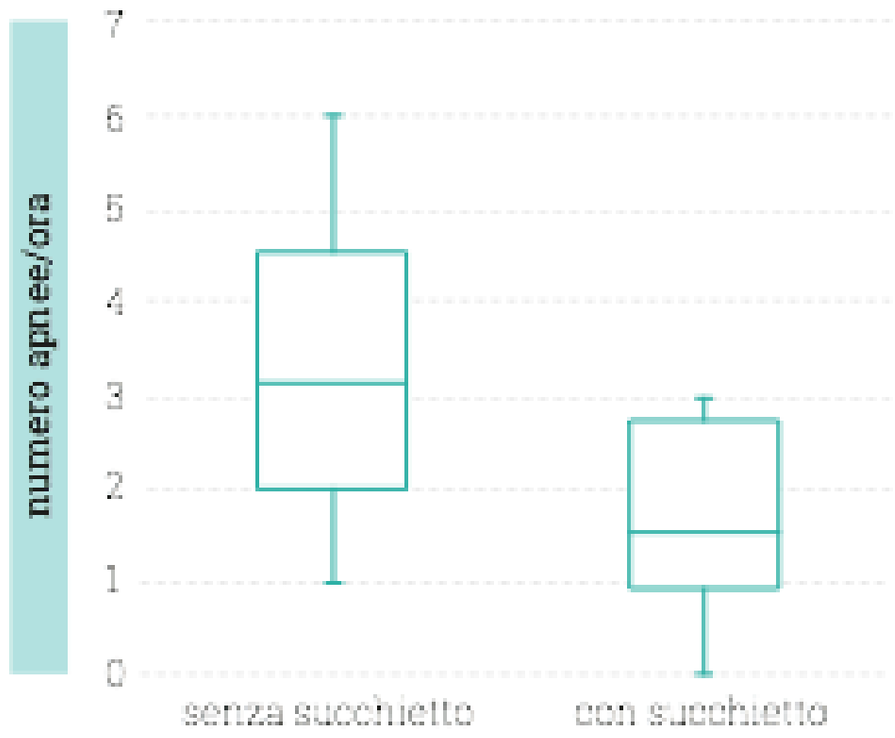
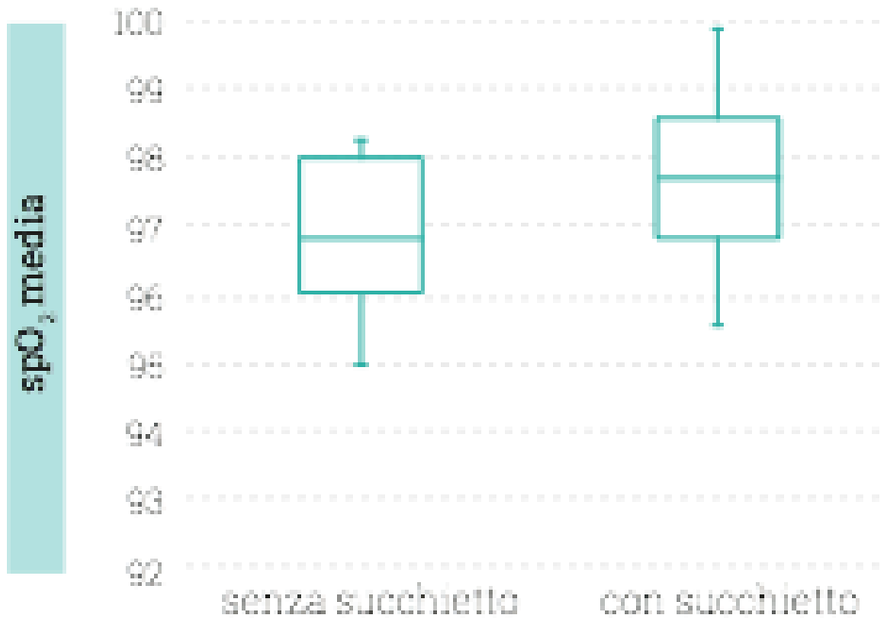
ABSTARCT
Background. Sudden Infant Death Syndrome is the name given to the sudden and unexpected death of an apparently healthy infant, which remains unexplained even after performing a complete post-mortem investigation. Objective. The aim of the study is to evaluate how soothers affect sleep apnea in infants with a history of ALTE. Method. 10 subjects between 1 month and 2 years of age with a history of idiopathic ALTE were non-selectively recruited. Patients were subjected to a cardio-respiratory monitoring at home for two consecutive nights; in the first night the soother was not used, during the second night the soother was used for at least four hours of sleep. Parents were given an assessment questionnaire to evaluate and report any irritation due to the soother. All the traces obtained were analyzed blindly by an expert pediatrician on Sleep Disorders, in particular peripheral oxygen saturation (SpO2), heart rate (FC), electrocardiogram (ECG) and the presence of apneas and / or hypopneas Results. In all cases, there was a reduction in nocturnal apnea events; only when the mother reported the impossibility of using the soother, there was a lack of effect. The use of the soother resulted in a reduction in the number of pathological apneas / night (-1.7%), an improvement in the average SpO2 (+ 0.8%) and an increase in the value of the minimum SpO2 detected (+ 2%). Conclusion. The results show that the use of the soother improves the respiratory capacity of children with nocturnal apneas at night.

KEYWORDS
Soothers, Polysomnography, Sudden infant death syndrome, Infant sleep, Mandible advacnement, Obstactive apnea syndrome

INTRODUCTION
SIDS (Sudden Infant Death Syndrome), commonly known as 'cot death' is the name given to the sudden and unexpected death of an apparently healthy infant, which remains unexplained even after performing a complete post-mortem investigation. In Italy, SIDS affects 1 in 700/1000 infants, with a peak of incidence between 2 and 4 months. SIDS has some risk factors, such as sleeping in a prone position, sharing a bed with parents, over-coverage and exposure to cigarette smoke. Protective factors appear to be the supine position and the use of soothers [20]. There are several explanations related to the possibility of avoiding 'rebreathing' by avoiding direct contact with the sheets. It also seems that children who use soothers have a lower awakening threshold, and a greater production of arousal in the event of hypoxia. Furthermore, the use of soothers modifies air spaces by anteriorising the position of the tongue, an advantage that is maintained even if the baby loses the soother in his sleep [5, 11]. In 2006, the American Academy of Pediatrics (AAP) issued guidelines regarding the use of soothers and established that it is a protective factor in the incidence of SIDS [2]. Soothers also have the following benefits: - they do not reduce the period of breastfeeding for premature babies and children after the 1st month of life; - they help premature infants in neurological maturation. There are also some possible risks: - they may cause dental misalignments if the use is extended beyond 2 years; - they may disadvantage breastfeeding if used in the first month of life, before breastfeeding is begun; - they may determine the risk of otitis media, especially after the first year of age [12]. Soothers are indicated to reduce the risk of SIDS, but little is known about their possible role in children with a history of high-risk events that, in some cases, precede





ANALISI DI MONITORAGGIO RESPIRATORIO E CARDIO RESPIRATORIO IN NEONATI CON E SENZA UTILIZZO DI SUCCHIETTO

nosetti luana, levrini luca

50 bambini di età inferiore ai tre anni e di peso superiore a 1800g
registrazione in veglia con il saturimetro Nonin (model 8500MA)

Per i pazienti di età inferiore a 12 mesi il tempo di osservazione è stato di 40 minuti così ripartiti:
-20 minuti in decubito supino, di cui 10 minuti con l'uso del succhietto e 10 minuti senza succhietto.
-20 minuti n decubito supino con schienale inclinato di 30°, di cui 10 minuti con l'uso del succhietto e 10 minuti senza succhietto.

Per i pazienti di età superiore a 12 mesi il tempo di osservazione è stato di 40 minuti così ripartiti:
-20 minuti in decubito supino, di cui 10 minuti con l'uso del succhietto e 10 minuti senza succhietto
-20 minuti in posizione seduta, di cui 10 minuti con l'uso del succhietto e 10 minuti senza succhietto

Per limitare il possibile effetto di confondimento legato alle influenze nictemerali, metà campione è stato randomizzato ad iniziare il monitoraggio con il succhietto, la seconda metà ha iniziato senza.

Risultati:
- posizione supina con succhietto: 97,42%
- posizione supina senza succhietto: 96,25%
- posizione supina con schienale sollevato di 30°e posizione seduta con succhietto: 97,32%
- posizione supina con schienale sollevato di 30°e posizione seduta senza succhietto: 96,27%

il succhietto migliora la respirazione in quanto si ha un leggero aumento della SpO2 in tutte le posizioni analizzate durante il suo utilizzo. Non è stata invece riscontrata una differenza significativa tra i valori medi di saturazione tra le varie posizioni assunte dai bambini.

SUZIONE E RESPIRO:
SVILUPPO E INTERRELAZIONI

- premesse
- il problema respirazione orale
- succhietto e respirazione orale
- conclusioni

riposizionamento
della mandibola
in basso ed avanti

- posizionamento
- in alto e avanti della lingua

EUPNOICO

non è una
terapia

Risks and Benefits of Pacifiers

SUMI SEXTON, MD, *Georgetown University School of Medicine, Washington, District of Columbia*
RUBY NATALE, PhD, PsyD, *Mailman Center for Child Development, Miami, Florida*

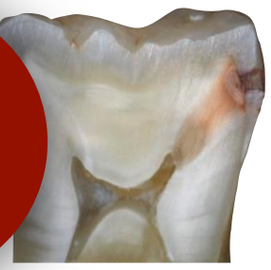
1 

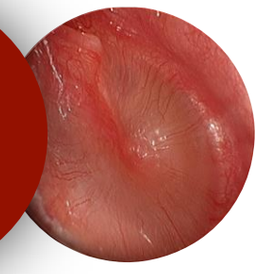
2 [SIDS]

3 

1 

2 

3 

4 

sono esito della respirazione?

XII CONGRESSO
NAZIONALE
FIMP 2018

LUCA LEVRINI

SUZIONE E RESPIRO: SVILUPPO E INTERRELAZIONI