# Oral Abnormalities in Taiwanese Newborns

Ming-Hui Liu, DDS Wen-Hsi Huang, DDS

#### ABSTRACT

**Purpose:** The objective of this study was to investigate the frequency of oral abnormalities in newborns in Chang Gung Memorial Hospital, Taipei, Taiwan.

**Methods:** Study subjects were neonates born at Chang Gung Memorial Hospital between January 2000 and April 2000 (inclusive). All subjects were examined within 3 days of birth. Babies with craniofacial anomalies and/or other systemic diseases requiring intensive care were excluded. A dentist examined newborns using mirrors, tongue blades, and a flashlight.

**Results:** The authors examined a total of 420 neonates and found the frequency to be 94% for oral cysts and 1% for natal and neonatal teeth. Neither the frequency of palatal and gingival cysts of the newborn nor that of natal and neonatal teeth was associated with gender, body weight, and gestation age.

**Conclusions:** Babies born at Chang Gung Memorial Hospital demonstrate a high rate (94%) of oral cysts of the newborns. (*J Dent Child*. 2004;71:118-120)

Keywords: Palatal cysts of the newborn, gingival cysts of the newborn, natal teeth, neonatal teeth

Although oral abnormalities in newborns are not uncommon, few studies have described the phenomenon. Fromm's 1967 study of 1,367 newborns differentiated conditions that affect the newborn into Epstein's pearls, Bohn's nodules, and dental lamina cysts.<sup>1,2</sup> Epstein's pearls are midpalatal microkeratocysts formed from epithelial rests by the 14th week in utero. Bohn's nodules were originally described in 1866 as remnants of mucous gland tissue found on the buccal or lingual aspects of the dental ridges. Dental lamina cysts are formed from the remnants of dental lamina and found on the alveolar ridges of newborns. These terms, however, are frequently confused and used synonymously. In addition, mucous glands are rare on the lateral surface of the alveolar ridges, so this origin is no longer accepted.

Currently, "palatal cysts of the newborn" describes small superficial microcysts of the midpalatal raphe, arising from epithelial inclusions along the fusing line of the palatal folds. "Gingival cysts of the newborn" are located in the alveolar ridge area and arise from remnants of degenerating dental lamina.

While previous studies investigating the incidence of certain oral abnormalities in newborns indicate a relatively high frequency of palatal cysts and gingival cysts of the newborn, no

#### METHODS

This study included infants born between February and April 2000 at Chang Gung Memorial Hospital. Babies with craniofacial abnormalities or with other systemic conditions requiring intensive care were excluded. All subjects were born without delivery complications. Two authors had the consensus for the definition of natal and neonatal tooth and palatal cysts and gingival cysts of the newborn. One dentist examined all newborns with mirrors, tongue blades, and a flashlight in the hospital nursery. All babies were examined within 3 days of birth under parent's oral consent.

The authors recorded basic data on each baby, including date of birth, date of examination, mother's name, chart number, gender, body weight, gestation age, and delivery pattern. The authors segmented each arch into 12 separate areas to record the position of oral abnormalities. They also recorded natal and neonatal teeth, including the number, color, shade, mobility, and surrounding gingiva tissue.

### RESULTS

All 420 newborn subjects (mean gestation age=38.4±2.2 weeks, range=34-42 weeks; mean body weight=3.2±0.4 kg,

Dr. Huang is chief and Dr. Liu is attending staff, Department of Pediatric Dentistry, Chang Gung Memorial Hospital, Taipei, Taiwan. Correspond with Dr. Huang at whhuang@ms16.hinet.net

specific research has been published which limits the study population to those of East Asian ethnicity. This study investigated the frequency of several oral abnormalities in newborns delivered at Chang Gung Memorial Hospital in Taipei, Taiwan.

Table 1. Characteristics of Natal and Neonatal Teeth						
	Natal teeth	Neonatal teeth				
No.	1	2				
Position	Lower incisor area	Lower incisor area				
Tooth size	2×1×1 mm	2×2×1 mm				
Tooth color	Gray	Yellow				
Tooth surface	Hypoplastic enamel	Hypoplastic enamel				
Mobility	Grade III	Grade I				
Gingiva	Swelling, laceration	Mild inflammation				
Treatment	Extraction	Follow-up				

range=2-4.8 kg) were of East Asian ethnicity. Two hundred thirty-one (55%) of the infants examined were male and 189 (45%) were female. Two hundred twenty-six newborns (54%) were born via normal delivery, and 194 (46%) were delivered via cesarean section.

Four major kinds of oral abnormalities were found: (1) natal teeth; (2) neonatal teeth; (3) palatal cysts of the newborn; and (4) gingival cysts of the newborn. This study identified 1 natal tooth in 1 subject and 2 neonatal teeth in another. The frequency of natal and neonatal tooth was 3/420 (1:140; 1%). All 3 teeth were located in the mandibular anterior area (Table 1). The mobility of the paired neonatal teeth was assessed as grade I and did not interfere with feeding. These teeth were observed for a few months, as were the neonatal teeth that remained as primary dentition. The natal tooth was assessed as mobility grade III, with swelling in the surrounding gingiva. The natal tooth was extracted for safety concerns after parents' consent.

Among the subjects examined, 86% had palatal cysts and 79% had gingival cysts, with 94% having either palatal or gingival cysts. The authors show the different frequencies according to position in Figure 1. The incidence of palatal cysts was highest, and, of the gingival cysts, the buccal aspects of upper arch and lingual aspects of lower arch were more pronounced than others. According to this study's results, the frequency of palatal cysts and gingival cysts of the newborn was not significantly different (*P*>.05) between differing gender, body weight, gestational age, and delivery pattern variables.

#### DISCUSSION

Oral abnormalities of newborns include: (1) inclusion cyst; (2) alveolar lymphangioma; (3) median alveolar notches; (4) natal teeth; (5) neonatal teeth; (6) congenital epulis; (7) commissural lip pits; and (8) ankyloglossia.<sup>1</sup>

The terms "natal" and "neonatal" teeth refer only to the time of eruption but not to the origin of tooth germ. The crowns of natal and neonatal teeth are either well formed or discolored with an irregular surface.<sup>3,4</sup> They



Figure 1. The number in each column indicates the frequency (%) of inclusion cysts in different location. The frequency of the palatal cyst was the highest, and the gingival cyst over all the maxilla area was more than those over the mandibular area. The buccal aspects of upper arch (R't =38%, L't: =34%) and lingual aspects (R't =33%, L't =31%) of the lower arch were more pronounced than others.

are mostly mobile due to either short or missing roots. The surrounding gingival tissue is typically normal. Histologically, natal and neonatal teeth have hypoplastic enamel and some have irregular dentin and enlarged interlobular areas in the dentinal tubules. Most of them have large vascular pulp and may fail to form cementum.

Other studies<sup>4,5,8</sup> reported the frequency of natal and neonatal teeth (Table 2). In this study, 1 natal tooth and 2 neonatal teeth were located in the mandibular area and the frequency (1:140) was higher than King's<sup>4</sup> (1:1,324) and Kates et al<sup>5</sup> (1:1,397). This variance may be due to racial difference and examination methods. Eighty percent of natal teeth belong to primary dentition, with the remainder being supernumerary teeth.<sup>4</sup> Most natal and neonatal teeth (80% to 90%) occur in the mandibular incisor region, except in the case of cleft lip and palate, where they occur mostly in the maxillary cleft areas. In some reports, the natal and neonatal teeth are frequently found concurrently with developmental abnormalities and syndromes.<sup>4-7</sup>

Gingival cysts near the surface appear as white masses that vary from less than 1 to several millimeters in diameter. They

Table 2. Studies of the Frequency of Natal and Neonatal Teeth								
	Kates 1972~1975	King 1989	Friend 1990	Liu present study				
Sample no.	N=18,155	N=1,324	N=500	N=420				
Frequency	1/1,397 (0.07%)	1/1,324 (0.07%)	1/500 (0.7%)	1/140 (0.9%)				
Location	Yes	Yes	NA	Yes				

\*Located in the mandibular incisor area.

Table 3. Studies of the Frequency of Palatal Cysts and Gingival Cysts of the Newborn								
	Fromm 1965	Berkman 1968	Jorgenson 1982	Friend 1990	Liu (present study)			
Sample no.	N=1,367	N=209	N=2,258	N=500	N=420			
Palatal cyst (%)	NA	65	64	58	86			
Gingival cyst (%)	NA	NA	53=Whites 40=African Americans	23	79			
Oral cysts* (%)	76	80	NA	NA	94			
Cyst size	NA	NA	1 mm	1-3 mm	NA			
Cyst color	NA	NA	Yellow-white	White	White			
Race	Whites African Americans	NA	Whites African Americans	NA	Asian			
Position	Pa>Max>Md	Max>Md	NA	NA	Pa>Max>Md			

\*Either the palatal or gingival cysts of the newborn. Pa=palatal; Max=maxilla; Md=mandible.

do not increase in size with age and usually are not visible several weeks after birth. In some reports, they are rarely seen after 3 months of age.<sup>1</sup> Only a few studies<sup>1,2,8,9</sup> have been published on the subject of the incidence of palatal and gingival cysts (Table 3). The frequency of cysts (94%) in this study's sample was higher than those recorded in any of the other published reports, and the frequency of palatal cysts (86%) and gingiva cysts (79%) were not low.<sup>1,2,8-10</sup> The variance may be caused by racial difference, examination methods, and different definitions of the cysts. The authors also examined the newborns within 3 days of birth, and separated upper and lower arches into 12 columns to record the location of the oral abnormalities and collect data. These reasons may contribute to the higher frequency of palatal and gingival cysts of the newborns.

Fromm<sup>2</sup> and Jorgenson<sup>1</sup> had reported that Whites had a higher incidence of palatal and gingival cysts than African Americans. Cyst sizes were between 1 mm to 3 mm, and cyst colors were yellow and white. This study, however, found no significant correlation between gender, body weight, and gestation age. Sample variations, evaluation criteria, and examination methods may have influenced the rate of frequency found in this report.

Although the mouth opening, the cleanness of the oral cavities, and head position of newborns all displayed wide variation in all newborns, the authors did their best to standardize the examination method. Only 1 dentist, using a flashlight and mirrors, examined the 420 newborns, so the interexaminer bias could be ruled out. The particularly high frequency, however, underscores that gingival and palatal cysts are common in newborn oral cavities. The authors' confirmation of this finding can help practitioners reduce parental concern when their newborns are diagnosed with such conditions.

## **CONCLUSIONS**

In this study examining 420 Taiwanese newborns of East Asian ethnicity in Chang Gung Memorial Hospital, the authors determined that:

- 1. The palatal cyst frequency was the highest. Of the gingival cysts, the buccal aspects of the upper arch and lingual aspects of the lower arch were more pronounced than others.
- 2. The frequency of palatal and gingival cysts of the newborn was not significantly affected by gender, body weight, gestational age, or delivery-pattern variables.
- 3. One natal tooth in 1 subject and 2 neonatal teeth in another were located in the mandibular anterior area for an incidence less than 1%.

## REFERENCES

- 1. Jorgenson RJ, Shapiro SD, Salinas CF. Intraoral findings and anomalies in neonates. *Pediatrics*. 1982; 69:577-582.
- Fromm A. Epstein's pearls, Bohn's nodules, and inclusion cyst of the oral cavity. *J Dent Child*. 1967; 24:275-287.
- 3. Hooley JR. The infant's mouth. J Am Dent Assoc. 1967;75:95-103.
- 4. King NM, Lee AM. Prematurely erupted teeth in newborn infants. *J Pediatr.* 1989;114:807-809.
- 5. Kates GA. Natal and neonatal teeth: A clinical study. J Am Dent Assoc. 1984;109:441-443.
- 6. Zhu J, King D. Natal and neonatal teeth. *J Dent Child.* 1995;62:123-128,
- Cunha RF, Carrilho Boer FA, Torriani DD. Natal and neonatal teeth: Review of the literature. *Pediatr Dent.* 2001;23:158-162.
- 8. Friend G, Harris E, Mincer H, Fong T, Carruth K. Oral anomalies in the neonate, by race and gender, in an urban setting. *Pediatr Dent.* 1990;12:157-161.
- 9. Cataldo E, Berkman MD. Cysts in the oral mucosa of newborns. *Am J Dis Child.* 1968;116:44-48.
- 10. Donley CL, Nelson LP. Comparison of palatal and alveolar cysts of the newborn in premature and full term infants. *Pediatr Dent.* 2000;22:321-324.

Copyright of Journal of Dentistry for Children is the property of American Society of Dentistry for Children and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.