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NATAL AND NEONATAL TEETH

A REVIEW OF TWENTY-FOUR CASES REPORTED IN THE LITERATURE

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INTRODUCTION

Definition of Terms.—"Natal teeth" have been defined as teeth which are present in the oral cavity of the infant at the time of birth, while "neonatal teeth" will in this paper refer to those teeth which erupt during the neonatal period (from birth to 30 days).

Prematurely erupted primary teeth present at birth have been described as "congenital teeth" or "fetal teeth" in early pediatric texts and dental literature. The term "dentinio praecox" has also been used and although this last is a more scientific term, it is also too broad to accurately define the teeth erupted at or near birth, since prematurely erupted permanent teeth may also be included. The various terms mentioned above have, in recent years, been discarded in favor of the term "natal teeth." For reasons which will become more apparent during the course of this review, the term "neonatal teeth" is also offered as a useful and descriptive term.

Definition of the Problem.—Natal and neonatal teeth constitute a problem for the attending obstetrician or pediatrician since the presence of such teeth may (a) be symptomatic of some underlying systemic disturbance and (b) may constitute a local problem during breast feeding or (c) may result in trauma to the infant's tongue. The question of the normality of the structures and whether such prematurely erupted teeth should be retained or extracted are questions which the obstetrician will refer to the pediatrician and which the pediatrician will often refer to the pedodontist.

Purpose of the Paper.—This paper is an attempt to review the recorded literature on the subject in order to establish the present status of our knowledge of this problem. An attempt was also made to discover any etiologic factors that may account for this anomaly from the analysis of those cases reported in the literature. The subject matter for this review was thus derived from (a) case reports of actual instances of natal and neonatal teeth and (b) a general review of the subject as presented in various textbooks.

It should be pointed out that there were actually few cases of natal teeth reported in the literature during the last fifty years. A search through the literature revealed only twenty-four cases reported. The data obtained from the twenty-four case reports are presented in Tables I and II. Unfortunately, only a few of these were accompanied by good histories or discussed the causes of the premature eruption of the teeth.

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*Professor of Graduate Pedodontics.

349
<table>
<thead>
<tr>
<th>CASE NO.</th>
<th>AUTHOR</th>
<th>YEAR</th>
<th>TYPE OF TEETH</th>
<th>TEETH AFFECTED</th>
<th>DESCRIPTION OF TEETH</th>
<th>AGE OF ERUPTION</th>
<th>SYSTEMIC CONDITION OF INFANT</th>
<th>CLINICAL SYMPTOMS</th>
<th>COMPLICATIONS</th>
<th>FAMILIAL TENDENCY</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Magitot</td>
<td>1883</td>
<td>Primary</td>
<td>Lower teeth</td>
<td>None</td>
<td>Healthy</td>
<td>None</td>
<td>Extracted</td>
<td>Profuse hemorrho-</td>
<td>Died</td>
<td></td>
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<tr>
<td>2</td>
<td>Ballantyne</td>
<td>1897</td>
<td>Primary</td>
<td>Upper centrals</td>
<td>Well formed</td>
<td>?</td>
<td>None</td>
<td>Teeth sloughed</td>
<td>Alveolar process</td>
<td>?</td>
<td>Present at 16 months</td>
</tr>
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<td>3</td>
<td>Ballantyne</td>
<td>1897</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>?</td>
<td>None</td>
<td>Syphilis from</td>
<td>Infant died</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ballantyne</td>
<td>1897</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Became soft</td>
<td>Congenital syphilis</td>
<td>Snuffles</td>
<td>Papular eruption</td>
<td>None</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ballantyne</td>
<td>1897</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Soft and pullearous</td>
<td>Bottle fed</td>
<td>None</td>
<td>None</td>
<td>?</td>
<td>?</td>
<td></td>
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<tr>
<td>6</td>
<td>Ballantyne</td>
<td>1897</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Normal</td>
<td>Breast fed</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<tr>
<td>7</td>
<td>Krakovski</td>
<td>1902</td>
<td>Primary</td>
<td>One lower central</td>
<td>None</td>
<td>Feelde</td>
<td>Ulcerated tongue</td>
<td>Ulcerated tongue</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Rosenhaupt</td>
<td>1911</td>
<td>Primary</td>
<td>None</td>
<td>None</td>
<td>?</td>
<td>None</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Schelling</td>
<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Shells of enamel</td>
<td>?</td>
<td>None</td>
<td>None</td>
<td>?</td>
<td>Extracted easily</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Turner</td>
<td>1912</td>
<td>Primary</td>
<td>One lower central</td>
<td>None</td>
<td>?</td>
<td>None</td>
<td>None</td>
<td>?</td>
<td>Fell out after few days</td>
<td></td>
</tr>
<tr>
<td>11</td>
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<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>?</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td>Present after 14 years</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Asana</td>
<td>1921</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>?</td>
<td>None</td>
<td>Present</td>
<td>Extraction re-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Kennedy</td>
<td>1924</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Well formed</td>
<td>?</td>
<td>None</td>
<td>Uppers lost</td>
<td>requested</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>Balard</td>
<td>1924</td>
<td>Primary</td>
<td>One lower incisor</td>
<td>Procladi-</td>
<td>?</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Balard</td>
<td>1924</td>
<td>Primary</td>
<td>One lower incisor</td>
<td>cadious</td>
<td>?</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td>Shed early</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Horton</td>
<td>1924</td>
<td>Primary</td>
<td>Six upper incisors</td>
<td>Twins</td>
<td>?</td>
<td>None</td>
<td>None</td>
<td>Died</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Name</td>
<td>Birth Year</td>
<td>Type</td>
<td>Age (months)</td>
<td>Teeth</td>
<td>Condition</td>
<td>Gum</td>
<td>Tongue</td>
<td>Prone</td>
<td>Unerupted</td>
<td>Erupted</td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
<td>--------------</td>
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<td>--------</td>
<td>--------</td>
<td>-----------</td>
<td>---------</td>
</tr>
<tr>
<td>8</td>
<td>Rosenhaupt</td>
<td>1911</td>
<td>Primary</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>Present</td>
<td>Present</td>
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<tr>
<td>9</td>
<td>Schelling</td>
<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Shells of enamel</td>
<td>Partly formed</td>
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<td>None</td>
<td></td>
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<td>Present</td>
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<tr>
<td>10</td>
<td>Turnaer</td>
<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
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<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
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<td>Present</td>
</tr>
<tr>
<td>11</td>
<td>Turner</td>
<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
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<td>Present</td>
</tr>
<tr>
<td>12</td>
<td>Asans</td>
<td>1921</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>13</td>
<td>Kennedy</td>
<td>1924</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Well formed</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>14</td>
<td>Balard</td>
<td>1924</td>
<td>Primary</td>
<td>One lower incisor</td>
<td>None</td>
<td>Twins</td>
<td>None</td>
<td>None</td>
<td></td>
<td>None</td>
<td>Present</td>
</tr>
<tr>
<td>15</td>
<td>Balard</td>
<td>1924</td>
<td>Primary</td>
<td>One lower incisor</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>None</td>
<td>Present</td>
</tr>
<tr>
<td>16</td>
<td>Horton</td>
<td>1924</td>
<td>Primary</td>
<td>Six upper anteriors</td>
<td>None</td>
<td>2 months prematurity</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td>Present</td>
<td>Present</td>
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<tr>
<td>17</td>
<td>Capon</td>
<td>1925</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>Twins</td>
<td>None</td>
<td>None</td>
<td></td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>18</td>
<td>Capon</td>
<td>1925</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>19</td>
<td>Holt and</td>
<td>1940</td>
<td>Primary</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td></td>
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</table>

### B. Neonatal

<table>
<thead>
<tr>
<th></th>
<th>Name</th>
<th>Birth Year</th>
<th>Type</th>
<th>Age (months)</th>
<th>Teeth</th>
<th>Condition</th>
<th>Gum</th>
<th>Tongue</th>
<th>Prone</th>
<th>Unerupted</th>
<th>Erupted</th>
<th>Extracted</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Herpin</td>
<td>1912</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>None</td>
<td>Full-term</td>
<td>None</td>
<td>Papillae</td>
<td>None</td>
<td>None</td>
<td>Present</td>
<td>Present</td>
<td>None</td>
</tr>
<tr>
<td>21</td>
<td>Herpin</td>
<td>1912</td>
<td>Primary</td>
<td>Right lower central</td>
<td>None</td>
<td>Not full-term</td>
<td>None</td>
<td>Papilla</td>
<td>None</td>
<td>Present</td>
<td>Present</td>
<td>Present</td>
<td>None</td>
</tr>
<tr>
<td>22</td>
<td>Cusick</td>
<td>1923</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Fully developed</td>
<td>14 hours</td>
<td>Refused to nurse</td>
<td>None</td>
<td>Swelling</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Hawkins</td>
<td>1932</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Well formed</td>
<td>13 days</td>
<td>Good</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Cohn and</td>
<td>1935</td>
<td>Primary</td>
<td>Lower centrals</td>
<td>Well formed</td>
<td>2 days</td>
<td>Good</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Present</td>
<td>None</td>
<td></td>
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</tbody>
</table>
HISTORICAL REVIEW

"Babies born with erupted teeth were known to the Greeks and Romans (Gates, 1946). Superstitions concerning this phenomenon have varied from claims that such children were exceptionally favored by fate to the belief that they were doomed. Louis XIV, Mazarin, and Richard III are quoted as examples of the former (Fleischmann, 1877; Thoma, 1941). In Poland children born with teeth are considered to be monsters and bearers of misfortune. The latter belief seems to be prevalent in India as well, and a case report was published by Asana in 1921 in which extraction was requested on these grounds.

The importance of this problem had early recognition. Fleischmann in his textbook on pediatrics published in 1877 gave a good summary of twenty cases of natal and neonatal teeth. In 1896 Ballantyne collected case reports of seventy cases of natal and neonatal teeth and presented a paper on the subject before the Edinburgh Obstetrical Society. These two workers adequately described the opinion on the subject prior to 1900. Our own review will attempt to summarize the data since that time.

INCIDENCE OF NATAL AND NEONATAL TEETH

Natal Teeth.—The incidence of natal teeth is probably very low. Howkins (1932) reported only one case in 10,000 births during five years at the Maternity Hospital at Birmingham. Ballantyne (1897) reported only three cases in 17,578 births (1 in 6,000) at the Paris Maternity Hospital between 1853 and 1883 (Table III).

It would be very desirable to determine more accurately the frequency of occurrence of natal and neonatal teeth. Unfortunately, obstetrical records at our disposal were not very clear on this point, so that only verbal estimates could be obtained. The estimate for two of the Chicago hospitals investigated was about one case of natal teeth in approximately 2,000 births (Table III).

Neonatal Teeth.—The occurrence of neonatal teeth is undoubtedly less than the frequency of natal teeth, since during the past half century only five cases of neonatal teeth were reported teeth (Table I). We could not find evidence in the literature to confirm this, but it is possible that some cases may have been missed.

Tooth Type.—Natal and neonatal teeth may be classified as deciduous or supernumerary. The latter are more common and have a better prognosis. The former are usually unirooted and located in the upper jaw, where they may cause difficulty in feeding and later in eruption of permanent teeth.

Table III. Incidence of Neonatal Teeth by Hospital

<table>
<thead>
<tr>
<th>NAME OF HOSPITAL</th>
<th>NUMBER OF CASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paris Maternity</td>
<td>17.67</td>
</tr>
<tr>
<td>Hospital (Ballantyne, 1897)</td>
<td></td>
</tr>
<tr>
<td>Maternity Hospital Birmingham</td>
<td>10.00</td>
</tr>
<tr>
<td>(Howkins, 1932)</td>
<td></td>
</tr>
<tr>
<td>Cook County Maternity Hospital (Estimated)</td>
<td>6.00</td>
</tr>
<tr>
<td>Presbyterian Hospital</td>
<td>5.60</td>
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</table>

According to Brauer and associates, most natal and neonatal teeth are characterized by looseness and lack of root formation. The apparent discrepancy in total cases reported by Kennedy (1924) is due to the use of different criteria for what constitutes a case.
TABLE III. INCIDENCE OF NATAL AND NEONATAL TEETH

<table>
<thead>
<tr>
<th>NAME OF HOSPITAL</th>
<th>BIRTH RATE</th>
<th>NUMBER OF INFANTS WITH NATAL OR NEONATAL TEETH</th>
<th>RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paris Maternity Hospital (Ballantyne, 1897)</td>
<td>17,515 in 10 years</td>
<td>3 in 17,515</td>
<td>1 in 6,000</td>
</tr>
<tr>
<td>Maternity Hospital Birmingham (Howkins, 1932)</td>
<td>10,000 in 5 years</td>
<td>1 in 10,000</td>
<td>1 in 10,000</td>
</tr>
<tr>
<td>Cook County Maternity Hospital (Estimated)</td>
<td>6,000 a year</td>
<td>4 in 6,000</td>
<td>1 in 1,500</td>
</tr>
<tr>
<td>Presbyterian Hospital (Estimated)</td>
<td>5,400 in 3 years</td>
<td>3 in 5,400</td>
<td>1 in 1,800</td>
</tr>
</tbody>
</table>

Five cases of neonatal teeth were reported compared to nineteen cases of natal teeth (Table I). We could not discover any prevalence study of neonatal teeth in the literature. This is not surprising since pediatric records are only of relatively recent origin, while obstetrical records have been routine over many years. Natal teeth are likely to be discovered by the obstetrician during the course of his routine examination of the newly born infant. The discovery of neonatal teeth before the advent of the pediatrician during relatively recent times was left to the accidental finding by the mother.

TEETH AFFECTED

Tooth Type.—Natal and neonatal teeth have been reported as being deciduous or supernumerary teeth (Thoma, 1941). However, substantiating evidence to support this view was not found during our review. Of the twenty-four cases of infants with natal and neonatal teeth reported in the literature since 1900, twenty-one infants were described as having true primary teeth (Table I). In one of these twenty-one infants the author (Kennedy, 1924) also reported the presence of deciduous teeth in the upper jaw. However, the data in that case report are not reliable since the teeth had been lost and the information was obtained from the mother. In one case report, no information regarding the teeth was obtained since they had been removed by the midwife before they could be examined by the attending physician (Magitot, 1883). Two other case reports contained no information regarding the teeth.

According to Braun and associates (1947), supernumerary natal or neonatal teeth are characterized by their looseness and lack of root formation. This statement is not substantiated by any evidence by the authors. From our review of the literature, it was found that all the natal and neonatal primary teeth reported were loose and showed lack of root formation. Thus looseness and lack of root formation cannot be considered diagnostic of supernumerary teeth since primary teeth are similarly affected.

Tooth Class.—The teeth affected most often were the lower primary central incisors (Ballantyne, 1897). Of the twenty-four cases of infants reported in the literature since that time, twenty infants had teeth erupted in the lower jaw while in three infants the natal teeth occurred in the upper jaw. Two case reports contained no information regarding the teeth (Tables I and II). The apparent discrepancy in total number of cases is due to the fact that one case reported by Kennedy (1924) was an infant with natal teeth in both jaws.
In twenty of the twenty-four cases reported, the infants’ natal teeth were lower central incisors. Fourteen of the twenty cases were reported to be infants having both lower central incisors erupted, while in five case reports only one lower central incisor was reported to have erupted (Table II). Two lower teeth were reported in one instance (Magitot, 1883) but the tooth class was not specified.

In the upper jaw, six anterior teeth were reported at birth in one case (Horton, 1924). Upper central incisors were described by Ballantyne (1897) in one instance, and as mentioned before, one case of an infant with two upper deciduous teeth was reported to Kennedy (1924). Other teeth, such as cuspids and molars, have been mentioned by Ballantyne (1897) and Fleischmann (1877), and case reports have been cited by these authors.

There is thus a strong tendency for natal and neonatal teeth to be merely prematurely erupted lower central incisors (usually both). The strong predilection for the lower central incisors is not surprising in view of the fact that these teeth are normally the first to erupt into the oral cavity.

Occasionally upper primary central incisors may also be erupted at birth. Until actual evidence to the contrary is presented, we may assume that other teeth are very rarely affected.

**CLINICAL SYMPTOMS**

Symptoms associated with the eruption of neonatal teeth have been described as essentially the same as those found concurrent with normally erupting primary teeth ("teething"). Eruption of teeth during the neonatal period was reported in five of the twenty-four case reports (Tables I and II).

The eruption of the tooth may be accompanied with pain so that the infant refuses to nurse. Other symptoms such as infantile diarrhea, drooling, and malaise have, in some cases, been associated with the eruption of neonatal teeth. However, the presence of these symptoms in infants is a common occurrence and may be associated with the general growth changes occurring in the infant at that period (Fleischmann, 1877; Kruska, 1946).

The newly erupted neonatal or natal tooth is hypermobile (loose) and movable in all directions. This is due to the fact that the tooth is attached only at the neck to the gingiva since root formation is incomplete and bony attachment by gomphosis is not possible. Lack of root formation is easily demonstrated in roentgenograms.

The neonatal tooth may be discovered accidentally during an inspection of the oral cavity. This may be prompted by the infant’s refusal to nurse, or by the laceration of the infant’s tongue or mother’s breast.

Supernumerary and deciduous teeth should be eliminated from the diagnosis by a careful examination of the roentgenograms. These will usually reveal whether the true primary teeth are still within the developmental crypt. Roentgenograms should always be taken since it is very difficult to make any decision on the basis of tooth form alone.

**COMPLICATIONS**

Complications were described in six of the twenty-four cases reviewed. Texts and investigators (Fleischmann, 1877; Ballantyne, 1897; Howkin, 1932) described complications as being instance of an infant who refused to nurse resulting in abscess formation in lingual ulcerations have been described under observation at the pre the lacertated gingiva proved fatal. The bleeding in this case may be binemia which is normally present two to five days after birth (Milit reported two cases of natal teeth necrosis of the alveolar process and denture.

Some of the complications were:

1. When the teeth are not painful. This factor may (Cusick, 1923).
2. The teeth may lacerate the Intosh, 1940).
3. The teeth are loose and may constant danger of the lower and aspirated, especi- ates, 1947).
4. Natal teeth may also cause injuries. This is probably because the alveolar edge of the face. Krakovsky (1902) developed an ulceration of the mouth open, the infant had a large sublingual and refused to nurse.

**HISTOPATHOLOGY**

It became evident during this investigation was made of natal teeth. The clinical descriptions, Ballantyne most pultaceous in consistency and gum. In another instance quote- atious and soft. It is possible to had some connection with the condition of the infant’s tongue or mother’s breast.

Horton (1924) reported an instance premature with six upper described the shape and position of bent under pressure and were dents were found in his case and extracting them one of them cran...
the infants’ natal teeth were reported to be infrequent. Cusick (1924) reported an instance of an infant who refused to nurse. Laceration of the mother’s nipples resulting in abscess formation have been reported in a few instances. Sublingual ulcerations have been described in a few instances. We have one such case under observation at the present time. Excessive bleeding from around the lacerated gingiva proved fatal in a case described by Magitot in 1883. The bleeding in this case may have been prolonged due to hypoprothrombinemia which is normally present to some extent in the newborn infant from two to five days after birth (Mitchell-Nelson, 1945). Ballantyne (1897) reported two cases of natal teeth with complications. One of these developed necrosis of the alveolar process and died.

Some of the complications which have been described following the premature eruption of the teeth are here summarized:

1. When the teeth are not fully erupted, pressure on them may be painful. This factor may cause the infant to refuse the nipple (Cusick, 1923).
2. The teeth may lacerate the breasts during feeding (Holt and McIntosh, 1940).
3. The teeth are loose and movable in the early stages and there is a constant danger of the teeth becoming detached and either swallowed or aspirated, especially during nursing (Brauer and associates, 1947).
4. Natal teeth may also cause sublingual ulcerations (Ballantyne, 1897). This is probably due to the fact that the tongue in infants lies between the alveolar processes (Brodie, 1940) and the sharp incisal edge of the teeth may lacerate the sublingual surface. Krakovski (1902) reported an instance in which the infant developed an ulceration on the lower surface of the tongue and slept with his mouth open. In the case under our own observation, the infant had a large sublingual ulceration and was very irritable and refused to nurse.

HISTOPATHOLOGY OF NATAL TEETH

It became evident during this review that very little histologic analysis had been made of natal teeth. Little information could be obtained from the clinical descriptions. Ballantyne (1897) found that teeth were soft and almost pulpy in consistency and they quickly wore down to the level of the gum. In another instance quoted by the same author the teeth became gelatinous and soft. It is possible that in this instance the anomaly may have had some connection with the congenital syphilis present in the case or with its treatment with high doses of mercury which later on resulted in acrodynia.

Horton (1924) reported an interesting case of a Negro baby born two months prematurely with six upper anterior teeth erupted at birth. He described the shape and position of the teeth as good but remarked that they bent under pressure and were devoid of enamel. Schelling (1912) described the natal teeth found in his case as a loose shell of enamel, since while he was extracting them one of them cracked under the pressure of the forceps.

Twenty-four cases reviewed (Ballantyne, 1897; Howkin, 1932).
Howkins (1932) was the only person who examined a section of a natal tooth under the microscope. He published two illustrations of the ground section. He said, "It will be seen that the dentin is normal, with the exception of certain irregular spaces in the area of the dentin next to the amelodental junction; that is to say in that part of the tooth first calcified, and a slight irregularity in the distribution of the dentinal fibrils. The enamel did not appear to be fully calcified in thickness and the pulp chamber is possibly larger than normal, this being possibly due to the fact that calcification was not completed."

It is hoped that future investigators will pay greater attention to the histologic aspects of this problem.

ETIOLOGY OF THE NATAL TEETH

During our review of the literature it was discovered that although various factors have been suggested as causative in the premature eruption of the primary teeth, none could be well substantiated by either the author or the data obtained from the twenty-four case reports in the literature. Most of the case reports were lacking in specific data so that no conclusive evidence could be drawn from them.

The following factors have been suggested in various reports and texts as possible causes for this anomaly:

*Superficial Position of the Tooth Germ.*—Fleischmann, in 1877, while discussing the early eruption of the primary teeth, suggested that (1) the initiation of these teeth began earlier while the successive development was normal, (2) if the initiation were normal, then the growth during the subsequent fetal period was accelerated, or (3) the tooth germ may have been positioned superficially, close to the gingival surface. He further stated that the last was hereditary while the second (normal initiation and accelerated growth) was due to some pathologic changes. These hypotheses seem logical but lack definite proof.

*Increased Rate of Eruption During or After Febrile States.*—Abels in 1930 formulated the interesting theory that tooth eruption is accelerated during or after prolonged febrile processes. He made his analogy to a general increase in the growth of infants during or after such periods. Clinical observations have shown that growth in length may be relatively accelerated during or after a prolonged rest in bed. Cohn and Rector (1935) further suggested that pyrexia in gravidarum may exert a stimulating effect upon the fetal dentition. Although this hypothesis, which relates the premature eruption to febrile processes, has not been substantiated by any extensive studies, it may offer a possible explanation and merits further investigation.

*Inheritance.*—Inheritance seems to play a role in the causation of this anomaly and it has been considered to be a major factor by many authors (Holt and McIntosh, 1940; Capon, 1925; Rosenhaupt, 1911; Herpin, 1912; Ballantyne, 1897). Ten of the twenty-four infants whose case reports were analyzed (41.6 per cent) had other siblings or parents showing the same anomaly (Table I). This degree of association as a familial characteristic is well above chance.

Gates (1946) stated that irregular dominant, but the inhibitor or to two genes being in Holt and McIntosh (1940) a member of three successive instances in which twins were born he in which twins were born within the oldest son was the three teeth erupted. The child the second month. Asana (19 teeth born of the same father reported the case of two infants. It may be concluded from these reports that in famili It is to be regretted that most in this direction.

The Effects of Congenital Insufficiency in the early twentieth century there have been many usages of mercury, and although it is teeth, it has been postulated that the primary teeth which deserve attention. Alveolar process became necros infant developed snuffles and penicillin. The teeth became lacy with the fingers. It may be possible, as described by Ballantyne resem resulting from mercurial intox complications reported by Ballantyne doses of mercury used to itself.

Since only one of the two congenital syphilis and since the incidence of natality would appear unlikely that con eruption of tooth.

*Endocrinse.*—"The early embryonic development of abnormal glands of the gonads, and thymus tend to be dysplastic."

The above statement by Thoma, according to Schour and Massler, is not supported by any of the endocrine secretion.

*Dietary Deficiencies.*—The eruption has not received much out from clinical observations that...
Massler and Savara: Natal and Neonatal Teeth

Gates (1946) stated that "the condition (i.e., natal teeth) is probably an irregular dominant, but the irregularity might be due to the presence of an inhibitor or to two genes being acquired."

Holt and McIntosh (1940) reported a family in which natal teeth occurred in members of three successive generations. Capon (1925) reported an instance in which twins were born with two lower central incisors each. Their father also had teeth present at birth. Balard (1924) reported a case in which twins were born with teeth. Rosenhaupt (1911) described a family in which the oldest son was born with a tooth erupted and the third son with three teeth erupted. The children of the third son had teeth erupted during the second month. Asana (1921) reported the case of two infants with natal teeth born of the same father but by different mothers. Herpin (1912) reported the case of two infants in one family with neonatal teeth.

It may be concluded from a perusal of the literature that natal and neonatal teeth may occur in families and might at times be an inherited basis. It is to be regretted that most of the case reports lacked specific information in this direction.

The Effects of Congenital Syphilis.—Congenital syphilis, due to its prevalence in the early twentieth century, has been blamed for a large number of dystrophies, and although it is usually associated with retarded eruption of teeth, it has been postulated that it may, in some instances, accelerate the eruption of the primary teeth. Ballantyne (1897) cited two cases of natal teeth which deserve attention. In the first case the teeth sloughed out, the alveolar process became necrosed, and the child died. In the second case the infant developed smuffles and papular rash and was treated with high doses of mercury. The teeth became loose during the treatment and were picked out with the fingers. It may be pointed out that in both instances the symptoms described by Ballantyne resemble those observed in aerodynia, a condition resulting from mercury intoxication (Warkany and Hubbard, 1948). The complications reported by Ballantyne (1897) may have been caused by excessive doses of mercury used to treat the syphilis rather than by the syphilis itself.

Since only one of the twenty-four cases reported had a history of congenital syphilis and since the incidence of congenital syphilis has decreased, while the incidence of natal teeth has increased during the recent years, it would appear unlikely that congenital syphilis is causative in the premature eruption of teeth.

Endocrines.—"The early eruption of the teeth may be due to hormonal stimulation in abnormal glandular conditions. The hormones of the thyroid, the gonads, and thymus tend to stimulate developmental processes" (Thoma, 1941).

The above statement by Thoma is not substantiated by any evidence. According to Schour and Massler (1945), the eruption of teeth is not hastened by any of the endocrine secretions during fetal life.

Dietary Deficiencies.—The effects of dietary deficiencies on the rate of eruption has not received much attention. Schour and Massler (1945) point out from clinical observations that the eruption of the teeth is accelerated in
scorbutic infants. Other authors report a retardation in eruption. Slobodin, Benson, and Mesten (1947) have shown that both the full-term and premature infant have a good vitamin C level at birth, even in cases where the mother’s blood serum level was very low. It is unlikely therefore that, even if such does result in accelerated eruption, such a factor would be operative in the newborn infant.

**Summary.—**With the exception of the familial tendency, all the factors listed above can be discarded easily as unsatisfactory explanations or cause for the phenomenon of natal and neonatal teeth. The familial tendency is striking. Careful attention to genetic factors in future case reports may further elucidate the etiology of natal and neonatal teeth.

**Management of Natal Teeth**

If the tooth is not causing any difficulty to the infant or mother, it should be left alone. It may eventually become firm (Magitot, 1883; Cohn and Rector, 1935). Turner (1912) reported a case of natal teeth which were still present at 14 years of age.

Difficulty may be experienced during nursing if the tooth interferes with suckling at the breast (Magitot, 1883). There is also some danger of a loosened tooth being swallowed. Extraction may be done after careful consideration of the effects of such a loss which, of course, condition such judgment. The risk of laceration of the nipples should not constitute grounds for injudicious extractions. Holt and McIntosh (1940) pointed out the fact that children with normal primary teeth have often been nursed up to 2 to 3 years of age.

**Precautions.—**(1) If extraction is indicated (as occasionally it may be), proper care should be exercised not to tear the gingival tissue, which is strongly adherent to the tooth substance (cementum). (2) Extraction of natal teeth has been associated with excessive bleeding. Magitot (1883) reported the case of an infant who bled continuously for six days and died. Excessive bleeding during the neonatal period is usually due to the physiologic hypoprothrombinemia occurring at this transitional period. No elective surgery should, therefore, be performed prior to the tenth day of life (Mitchell-Nelson, 1845). (3) The pediatrician should also make sure that the parents are well adapted to the situation and the child is not considered as accursed by some ill omen. Psychological adjustment of the parents to the situation is of great importance for the proper rearing of the infant.

**Summary and Conclusions**

1. A review of twenty-four case reports of natal and neonatal teeth is presented.
2. Natal teeth were found to occur approximately once in 2,000 births in two Chicago hospitals.
3. The teeth affected were of the primary dentition. The lower primary central incisors were reported erupted at or near birth in twenty of the twenty-four cases cited in the literature. Two lower central incisors were found in fourteen cases while upper incisors were reported in four. Indiscriminate extractions occurred in six of the fifteen.

4. The condition occurs when the extra tooth has little effect in causing the problem of natal and the neonatal period has rare review, nor have any large numbers of time in order to accurately determine what is particularly true of the etiology of the condition is regrettably not determined because of its rarity.

in eruption. Slobody, in a study of full-term and premature cases where the mother was aware that, even if severe, there would be operative in the

4. Indiscriminate extraction of these teeth is to be deplored. Complications occurred in six of the twenty-four cases described and deserve consider-

5. The condition occurs with significant frequency in families. It is pos-

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