Review of Current Literature

Development of the Human Jaws and Surrounding Structures From Birth to the Age of Fifteen Years

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Journal American Dental Association, Volume 20, March 1933.

This investigation was undertaken by the authors in an attempt to throw some light upon the etiology of the underdevelopment of the jaws and irregularities of the teeth which were frequently associated with early surgical treatment of complete congenital cleft of the upper jaw and lip. The study was begun upon human tissues of infants from birth to six months of age. The early findings, however, led the authors to include older material. Their report is based upon the study of twenty-five human jaws ranging from birth to fifteen years, as shown in Table I. Unfortunately the study had to be made from individuals, the normalcy of whose tissues and growth processes might be questioned. "According to clinical diagnosis, in most of the cases studied, the child died of tuberculosis or associated diseases, (empyema pleural, meningitis, etc.) Some died of severe intestinal disturbances, (enteritis). One died of diphtheria, one of scarlet fever. Several of the very young children, especially the two with cleft of the hard palate (new born, eighteen days) apparently died of debility."

A brief history is given of the information available and methods of investigation of the development of the teeth and jaws. This is followed by a rather detailed report of the "technic employed in investigation."

A detailed description and interpretation of the many excellent microscopic sections is given, too lengthy to be included here.

In regard to their findings concerning the calcification of the teeth, they publish Table II about which they have the following to say, in part. "We would like to state here that we do not consider the absolute ages of our

specimens the most significant item. We are well aware that there are wide variations in the body development, even of perfectly healthy children, and consequently more so of sick children who finally succumbed to various diseases. What we wish to emphasize particularly is the order in which calcification occurs. Regardless of whether the upper central incisor and cuspid begin to calcify at two months or at six months, the upper lateral incisor has always found in our specimens to be one-half year or more behind these other two in this respect, and the bicuspids from one-half to one year behind the upper lateral incisors. Far more attention will be paid in our study to the relative order of calcification and development than to the absolute date of the first calcification, which is naturally subject to wide individual variations."

"In any study of this type, it must be understood that the ages given in connection with tooth development are only relative. Variations from a few months to even years occur and are rather common. The great individual variations in birth weight, body development, general state of health and eruption of teeth are sufficiently known. They account for these irregularities. Our figures are true and correct as far as the relative development of the different permanent teeth is concerned. If the calcification of the permanent central incisors starts at two months, the first bicuspids will begin to calcify at 1½ years. If the calcification of the central incisor occurs six months later than would normally be expected, all the other germs are concurrently delayed in their development, and the bicuspids will in all probability not begin to calcify before the second year."

Regarding the relative positions of the permanent and decidious teeth, their sections show clearly that the maxillary permanent tooth germ at one time lies occlusal to the decidous tooth follicle, and that a reorientation follows until that relative position is reversed.

"The germs of the permanent incisors, permanent cuspids and bicuspids branch off from the lingual side of the dental lamina of the corresponding decidious teeth. They are originally located in the fibrous connective tissue overlying the deciduous crown on the occlusal side of the deciduous teeth. In the course of the growth of the maxillary ridge and during the occlusal movement of the deciduous teeth, the permanent germs are left behind by the deciduous teeth. Thus, they become located more and more on the lingual side of the deciduous teeth, and, at the same time, are surrounded and encapsulated by the lingual portion of the bone. As the deciduous teeth continue to move occlusally, the permanent germs finally assume a position above or between the roots of the deciduous teeth."

"This movement of the permanent tooth germs from the occlusal side of the deciduous teeth to the lingual side and finally to a position above the deciduous roots is true of every permanent tooth which has a deciduous predecessor, in both the upper and lower jaw. At birth, the permanent central incisors, lateral incisors and cuspids have already reached a position lingual from the deciduous teeth, and the bicuspids are still on the occlusal side of the corresponding deciduous molar teeth. The calcification of the permanent germs does not begin until they are located well toward the lingual side of the deciduous teeth and nearly or entirely embedded in the lingual alveolar bone.

This position is reached by the central and lateral incisors, and cuspids soon after birth. The bicuspids do not occupy the position on the lingual side of the deciduous molars until the age of from one and a half to two and a half years on the average."

From this study of the sections the authors have reached some conclusion regarding surgery for cleft palates. The preferable age for operation, and the positions at which wires may be placed with the least danger to the developing teeth, are given. There is also a warning regarding everting tissue flaps from the palate.

A careful study of the many excellent illustrations offered will be enlightening. A rather unusual illustration is included in the report, a colored photograph of a full sagittal section (35 microns thick) of face and neck of a six weeks old child.

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Table I—Material Available for Study

Age	Number of Specimens	Remarks
New-born	3	One with cleft of soft and part of hard palate.
2 weeks	1	
18 days	1	Cleft of soft and hard palate.
1 month	2	
5 weeks	1	
6 weeks	1	
2 months	2	
3 months	1	
5 months	1	
6 months	1	
9 months	1	
1 year	1	
1½ years	2	
2 years	1	
2½ years	1	
3 years	1	
4½ years	1	
8 years	1	Lower jaw only.
11 years	1	
15 years	1	

Table II—Time of Beginning Calcification of the Permanent Teeth

Upper Jaw — Tooth	Legros-Magitot (Reproduced by Noyes, Bodecker)	Pierce	Black	Brady	Churchill	Author's Findings
1	1st month	1st yr.	1st yr.	1st yr.	2 mo.	2 to 6 months
2	1st month	2nd yr.	2nd yr.	2nd yr.	2 mo.	1 yr. to 15 mo.
3	1st month	3rd yr.	3rd yr.	3rd yr.	4½ mo.	3 to 6 months
4	1st month	4th yr.	5th yr.	4th yr.	3 yr.	1½ to 2 years
5	1st month	5th yr.	5th yr.	4th yr.	4 yr.	2 to 2½ years
6	6th (fetal) month	25th (fetal) week	Before birth	25th (fetal) week	9th (fetal) month	1 to 4 months
7	3rd year	5th yr.	6th yr.	5th yr.	4 yr.	2 to 2½ years
8	12th year	9th yr.	9th yr.	8th yr.	8 yr.	7 to 9 years
Lower Jaw — Tooth						
1	1st month	1st yr.	1st yr.	1st yr.	2 mo.	3 to 6 months
2	1st month	2nd yr.	2nd yr.	2nd yr.	2 mo.	3 to 6 mo.
3	1st month	3rd yr.	3rd yr.	3rd yr.	4½ mo.	3 to 6 months
4	1st month	4th yr.	5th yr.	4th yr.	3 yr.	1½ to 2 years
5	1st month	5th yr.	5th yr.	4th yr.	4 yr.	2 to 2½ years
6	6th (fetal) month	25th (fetal) week	Before birth	25th (fetal) week	9th (fetal) month	1 to 4 months
7	3rd year	5th yr.	6th yr.	5th yr.	4 yr.	2 to 2½ years
8	12th year	9th yr.	9th yr.	8th yr.	8 yr.	7 to 9 years

Mild Pressure and Great Force

By J. E. RICHMOND, D.D.S., *Eugene, Oregon*

Journal American Dental Association, September, 1933.

In his review of the literature Dr. Richmond found only two references to pressure, quoting measurable units, these being in ounces and pounds. He says that we have been told that mild pressure should be used and that great force will cause destruction without being told what these forces are. Part of Oppenheim's experiment is quoted, about which he says: "To the extent of proving the desirability of mild force for moving teeth, the experiment seems to have been successful, but the value to the practicing orthodontist would be much greater if Oppenheim had known and recorded just how many ounces of pressure he had used as a mild force and whether his violent force was one pound or six."

The author has developed an instrument similar to an automatic plugger which will measure push and pull pressure in ounces. A chart is given showing the ounces necessary to deflect for measured distances wires of various gauges. Checking with this instrument, an upper central incisor was moved, using two ounce pressure, with apparent excellent tissue reactions.

Reviewed by WM. B. DOWNS

A Study of Impression and Model Materials for Facial Casts

By ERIC G. GOLDEN, D.D.S., M.S.D., *St. Louis.*

Journal American Dental Association, July, 1933.

The author starts his article with several paragraphs describing the use and value of casts. The technique of impression and model making are given in detail and should be readily followed. For impressions, the use of wax, both for spraying and brush application, and the use of hydro-colloidal compounds ("Negocoll") are discussed. For the casts he gives the methods of using plaster materials (particularly Hydrocol "B") and hard wax. Finishing the cast with lacquer and color is also discussed.

The last part of the article discusses, quite thoroughly, the important properties of the materials used in the technic.

Reviewed by WM. B. DOWNS

The Human Chin and Human Tooth Change

By THOMAS W. COOK D.D.S., *Washington, D. C.*

Journal of Dental Research. July, 1933.

The chin is one of the most characteristic structural features of the skull of man. Man is the only one of the animal kingdom to possess a true forward projecting chin. The author briefly gives L. Bolks and Dr. G. Elliot Smith's hypothesis of the development of the human chin. Bolks claims that the retardation of eruption of the molars combined with the regular growth rate of the body of the mandible results in the chin. Smith enlarges on this theory and introduces the brain as a modifying influence.

The author made a study of about two hundred skeletons of human foetuses ranging in age from two month to term. The author found great individual differences between jaws at any given age as well as between jaws of different ages. He notes that at an age somewhat less than eight months the human foetus has a distinctly projecting jaw, and while the adult jaw is naturally very different from the fetal jaw there is no definite period when the chin suddenly springs into being. In all ages, after the cartilaginous stage, the chin is more or less developed.

The author thus lays claim that there is no experimental evidence to support the Bolks-Smith hypothesis.

Reviewed by ERNEST MYER

Relations of the Human Denture

By FORREST H. ORTON, D.D.S., AND B. S. LISCHER, D.M.D., *San Francisco, California*

Journal American Dental Association, September, 1933.

The authors have made a study of 2,982 dentures of men and women

students entering the University of Berkeley to determine norms of the most favorable relationships of the teeth as the base line from which to evaluate the numerous, less favorable deviation of the teeth and to verify, or add some new facts to the concepts which had previously been presented.

132 dentures were classified as unmutilated and anatomically correct, and 52 of these responded to a request for detailed examination. Simons photostatic and gnathostalic methods were used for these cases.

In regard to the spheroidal theory of occlusion, the authors failed to find any perfect dentures but did note that the more anatomically correct the dentures were the closer they conformed to the surface of an eight inch circle.

They found eleven dentures with approximate occlusal contact in functional movement but none had "ideal cuspid contact in all relations". The overbite varied in these cases from an end to end bite to 1.5 mm.

The authors believe that neither direct observation nor the so-called study model method are adequate to permit us to judge whether the resultant deformities are due entirely to loss of teeth, lack of development in the jaws or both, or to what extent either of these factors have contributed to the deformity. They believe the gnathostatic method to be superior for this purpose.

Reviewed by WM. B. DOWNS

Mineral Metabolism in Relation to Dentition
II. Base-Forming and Salt-Poor Diets

By C. ULYSSES MOORE, M.D., F.A.C.P., *Portland, Oregon.*

Journal American Dental Association, September, 1933.

Dr. Moore discusses his subject, quoting from published articles of about forty different workers. A chart is given showing the mineral elements of the human body as determined by analyses of human ash. A table is also given showing the chemical reaction of a number of common foods. He believes the neutral diet to be the best but that the overconsumption of acid-ash foods is very common and the danger therefrom very grave. The value of salt (NaCl) is discussed and he says that civilized man in general uses far too much. Evidence to support this contention is given.

Two of his conclusions are: "Historical, chemical and clinical data support the hypothesis that salt-poor diets diminish focal infection and dental caries and improve the assimilation of calcium"; available evidence indicates that the etiologic factors involved in tooth decay are more systemic than local and that an adequate diet will prevent, check or cure caries."

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Symptomatology and Treatment of Abnormalities of the Mandibular Articulation

By DAVID J. GOODFRIEND, D.D.S., *Philadelphia, Pa.*
Dental Cosmos. September, 1933.

This report presents the following findings relative to the mandibular articulation: 1. The standardization of the normal. 2. The etiology of abnormalities. 3. The symptoms of abnormalities. 4. The classification of joint symptoms. 5. The procedure for the diagnosis of abnormalities. 6. The treatment of abnormalities. The problem was carried out through researches in anatomy, radiology, psychology, histopathology, statistics, and treatment of cases. The anatomical approach was carried out through the section of mandibular articulations of cadavera of normal and abnormal masticatory apparati. A definite relationship exists between the mandibular condyle and fossa in the normal, and this relationship is different in the abnormal. This is also true with respect to the muscles of mastication. The radiological study is based on making lateral radiograms of each joint in open and closed position. When taken on normal and abnormal dentures the findings were found to be the same as in the anatomical study. The psychological phase was concerned mainly with speech defects. Thirteen patients were selected from the speech clinic, all having malocclusions. By repositioning the mandible by means of bite-planes the patient made marked responses to speech training. The histopathological studies were confined to the work of Redfern, Phelps, Axhausen, Konjetzny, Von Staplemohr, Dufourmental and others. The report concludes this issue with the standardization of the normal mandibular articulation which gives the physiology of the part involved.

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