The Responsibility Of The Pediatrician In The Orthodontic Problem

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THE pediatrician has a large responsibility in preventing the development of an orthodontic problem in the growing child. It is he who can first observe in the infant the evidence of failure of development of the facial structures. When such failure is noted, the pediatrician can begin at once to institute measures to prevent or lessen future deformity which may require extensive oral correction. Although he cannot control the forces that developed the infant before birth, that being in large measure the internist's and obstetrician's responsibility, he can contribute a program of nutrition and care which will build strong, resistive oral structures with good alignment.

In this paper I shall discuss the leading postnatal influences which affect the growth and development of the facial structures and the teeth. The pediatrician who early takes roentgenograms of the head of the infant will be able to discover what density of bone is present, and what quality of supporting tissue. Subsequent x-rays of the head as the deciduous teeth appear will tell the pediatrician whether or not the anterior portion of the mandible will afford room for the perma-

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nent dentition. He can estimate the linear length of the bone supporting the deciduous teeth from second deciduous molar to second deciduous molar as the teeth emerge and determine from the breadth of the calcifying permanent teeth whether or not this portion of the jaw will be adequate.

Dr. Hays Nance,[6] quoting from the work of John Hunter, states that this distance is determined by the end of the first year. In observing children in my own practice, I have felt that failure to expand the dental ridges and interdental bone of the anterior portion of the mandible by the third year omened permanent failure in this development. The pediatrician who discovers that the infant's jaw is failing to expand linearly by the last half of his first year is faced with the problem of that child's future tooth development, and his potential requirement of orthodontic assistance.

The linear difference between the space needed for the ten deciduous teeth, and the linear length of the alveolar and interdental bone needed for the ten permanent teeth replacing them, will determine, in a large measure, the amount of deformity in alignment to be expected when the permanent central, lateral, cuspid and bicuspid teeth appear.

A child of five possessing small deciduous teeth and little expansion of the alveolar crests of the jaw, yet whose x-rays show large permanent teeth with a greater total linear requirement than the corresponding deciduous teeth already present, cannot fail to develop a malalignment of his permanent dentition. He will probably require extraction in order to make it possible for future orthodontic correction to improve facial appearance or to hold when the appliances are removed.

The linear growth of the posterior portion of

the mandible that supports the permanent molars continues to a later date. The most common and almost universal failure of spacing for the third molar among civilized peoples is but one index of inadequate development of the jaw bone.

If a pediatrician evaluated the relative effects of the muscular action of a baby nursing at the breast and of one nursing from a bottle, he would weigh more carefully the wisdom of placing an infant on a bottle. In accordance with Wolff's law, the vigor of the nursing infant and the resistance of the nipple to his effort determine how strong the important muscles of mastication will be. The pull of these muscles acts on their attachments and develops the accompanying bones of the skull and mandible in proportion to the force exerted. Nursing the breast requires a different muscular action and more effort on the part of the infant than nursing from a rubber substitute.

Not only must we consider the growth of the mandible, but we must study the factors in the development of the middle third of the face and the base of the brain, which determine the adequacy of lateral and forward movement of the face. This development determines the direction of the muscular pulls on the oral structures and influences the size and shape of the arches and vault of the mouth, and secondarily, the sinuses of the skull.

Two very important indices of this development are the adequacy of the orbital portion of the zygomatic arch (process fronto-sphenoidalis) and the maxillotemporal portion of the zygomatic arch. In the well developed child, the transverse diameter of the two malar prominences should be equal to, or slightly greater than, the transverse diameter of the fronto-sphenoidal processes.

Most bottle fed infants early show failure of

the growth between the malar prominences and a failure in development of an adequate orbital portion of the zygomatic arch. This is partially due to the weakness of muscles common to many bottle fed infants.

During the greater part of the first year, the bones of the face are the only bones subjected to stress—the stress of nursing and chewing. The author has pointed out[7,8] that metabolic upsets such as infectious diseases leave their imprint on developing bones under stress. The recurrent upsets of an allergic process leave even greater effects. As the child begins to walk, the foot and the knee and hip become bones of stress, and evidence of fragmentation in any of these can be interpreted as an index of disturbed dental development.

It is therefore logical that the severely allergic child with his recurrent allergic episodes is likely to experience failure in facio-dental development. It is very important to control the allergic process as quickly as possible to prevent the occurrence of dental deformity. In my own experience, some evidence of failure in alignment or development of the teeth is present in every case of persistent childhood allergy.

Congenital failure in development as well as post-natal injury of other facial structures may exert a definite effect on the developing face. An example of this is the lack of stimulation to growth found in the congenitally blind.

Infections of the nasal passages can also exert an arresting effect on the growing bones of the face and may permanently interfere with occlusion. Failure in the dental structures, especially in the deciduous teeth afflicted with rampant caries, which are now known to be controllable by adequate diets[9,10,11,12] may not only ruin an otherwise good mouth but may leave a badly

scarred area of little use to the orthodontist and a difficult problem to the prosthedontist. The early loss of teeth interferes with the full development of the alveolar bones and their supporting structures, when due to extensive decay.

The mechanical factors of injury can play havoc with the growing face and the occlusion of the teeth, as can the direct infection of the mandible or maxilla from abscesses. Burns of all types can damage the growth of the facial and dental structures, but are relatively few as compared with injurious factors of disturbed metabolism.

The pediatrician has a particular responsibility in recognizing the hypothyroid child and instituting early treatment. These children, when they reach adult life, often suffer loss of teeth due to porosity of bone, and extensive root resorption.[1] Orthodontia in these cases is apt to fail because of the same porous bony structure which cannot support appliances or retain good alignment, however well executed.

The hypogonad child[2,3] frequently presents a concomitant symptom of missing teeth in either or both the deciduous and permanent dentition. He may show underdevelopment of both mandible and maxilla. The proper stimulation of the gonads at an early date will also improve the facio-dental development. In a similar manner other endocrine disturbances,[4,5] especially of the pituitary, should be recognized in early childhood and the proper treatment instituted.

The pediatrician thus undertakes a double trust in assuming the guidance of the health of an infant. He not only treats the infant for infectious diseases and prescribes a diet to meet its growing needs; he directs a program calculated to determine the future dental development of that child.

He can determine by routine x-rays the chang-

ing conditions of the skull, and can interpret these findings as prophesies of future requirement for orthodontia. By encouraging the mother to nurse the infant, the pediatrician can early help the child to develop strong facio-dental structures entirely different from those of the bottle fed baby. He can avert or lessen many a dental deformity by recognizing early hypogonad, hypothyroid, and other endocrine disturbances of children and by instituting the proper therapy which, in turn, improves the facio-dental structures. He can also obviate many serious dental problems by checking allergies as quickly as possible, since the continual insult of an allergic process is accompanied by concomitant dental problems. The pediatrician, by means of x-rays taken at regular intervals, should anticipate the future development of orthodontic problems, so that the orthodontist may be consulted at an early date, before the permanent teeth have erupted.

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