

The Relation of Allergic Encroachment on the Constitution to Orthodontic Deformity*

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THE methods of studying developmental growth and some of its aberrations of interest to the orthodontist were presented to this Society last year by Drs. T. Wingate Todd, Carl C. Francis, T. T. Zuck, L. Dewey Anderson, B. Holly Broadbent and myself.¹ In this report I shall give more detailed information on the history of childhood allergy, its diagnosis and management, and its relation to facial growth.

The sequence of events in a typical allergic child is quoted from a previous report.

The symptoms of allergy begin to manifest themselves early in infancy. The child shows no significant variations from the normal until the third to the sixth week of life, when characteristic symptoms begin to appear. The first of these are colic and regurgitation of food. The pediatrician makes frequent contacts with the baby henceforth. He attempts various modifications of the diet until he finds one which is fairly agreeable. This diet, supplemented by antispasmodics, seems to alleviate most of the distressing symptoms and the child shows regular gains in weight. Despite the apparent control of the situation the baby continues to be a feeding problem and, within a few weeks, eczema appears. This may vary from a mild diaper rash or slight crusting of the scalp to a universal weeping eruption. Associated with the eczema, there are evidences of neurogenic instability such as general irritability, increased urination, and changes in muscle tone; the troublesome gastro-intestinal symptoms persist. Cherney has referred to this type of child as the one with the "exudative diathesis." Up to this point the symptoms are almost entirely due to food sensitivity.

At about six months of age nasal symptoms begin. These are the first evidences of a beginning inhalant sensitivity. They manifest themselves in nasal stuffiness, nose rubbing, thumb sucking and mouth breathing, all of which, though troublesome at the time, are not considered especially harmful by either the mother or the physician. During the remainder of the first year, there is a moderate increase in the severity of the nasal symptoms and the child is said to be afflicted with frequent attacks of naso-pharyngitis. A diagnosis of adenoids is made sooner or later and plans are made to remove the adenoids

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as soon as the suitable age is reached. The eczema continues on its decline as the respiratory phase increases and, in order to combat this difficulty, the tonsils and adenoids are removed between the ages of eighteen months and two years. Presently, and particularly in the winter, a croupy cough makes its appearance. It is spasmodic in nature and is often associated with wheezing respirations and fever. This cough is frequently confused with whooping cough and the child is subjected to unnecessary quarantine. After the quarantine is lifted, we find as a rule that his siblings have not contracted the highly infectious disease. The nasal symptoms continue although the cough may disappear, but soon another attack of croupy cough appears. Asthmatic bronchitis is often diagnosed at this time, but it is only when the attacks become more severe and the wheezing more pronounced that the correct diagnosis of bronchial asthma is made. Three years of age often marks the exacerbation of either the bronchial or nasal symptoms in the summer months during the pollinating seasons of the grasses or weeds. Our child now has seasonal hay fever. Associated with all these symptoms there are mild gastro-intestinal upsets. The child is a poor eater, shows definite pallor and slight undernourishment, and has probably received by this time a variety of tonic and vitamin products. If we should examine him at this time the significant findings might be grouped as follows :

1. Physical examination—
 - a. A thin boy, short for his age and light for his height.
 - b. The skin is dry and may show slight eczema in the folds.
 - c. There is a loss of muscle tone.
 - d. The face is flat and narrow.
 - e. The nose shows turbinate congestion.
 - f. There is some orthodontic deformity.
 - g. The palate is high-arched and narrow.
 - h. There may be wheezing rales in the chest.
2. Mental examination—
 - a. He is an irritable whiny child.
 - b. He is very erratic in his behavior.
 - c. Hyperactive periods alternate with great fatigue.
 - d. He has a short attention span.

The diagnosis of allergy is made on clinical grounds based upon the history and the physical findings. Etiological diagnosis is based upon skin tests and clinical experimentation. A positive skin test is only a clue. It represents past, present or future clinical disease. Furthermore, an individual may have severe symptoms on exposure to some substance to which no skin reaction is obtained. The clues obtained from the history and our knowledge of the life history of the disease, together with those obtained from skin testing are used to plan experiments in which the patient is removed from contact with the suspected substances. If the symptoms disappear the patient is exposed to the suspected substances one at a time in order to determine which clues are significant. It is only by prolonged study of this kind that an accurate etiological diagnosis can be made. Such a study comprises much more than a series of skin tests and a learned opinion, a method too often practiced. Success in the management of children with allergy, like the care of those with

orthodontic deformity, requires meticulous attention to detail and much cooperation between the patient and the physician or dentist.

The following case reports will illustrate the points just made.

R. M., aged 9, was first seen on September 28, 1936. The chief complaints were sneezing, stuffy nose, mouth breathing, and extreme nervous instability.

The delivery was normal. He was nursed for six weeks and then placed on a modified cow's milk formula; orange juice and cod-liver oil were added at about six weeks of age.

At about six weeks of age severe colic appeared. This was followed in a few weeks by eczema involving the face. Minor changes in the diet controlled the more severe symptoms of the eczema. At about five months of age nasal stuffiness, sneezing, nose rubbing, mouth breathing and thumb sucking were noted. These symptoms were of such severity that two adenoidectomies were performed before two years of age. At about this time it was noted that he was not making suitable gains in weight despite attempts to force feedings. Gradually he became a slim boy. During his pre-school and early school periods his emotional instability manifested itself in so marked a fashion that he was placed under the care of a pediatrician specializing in child guidance. As the teeth came in the parents noted a marked deformity and engaged an orthodontist who referred him to me for management of the underlying allergy.

Examination on September 28, 1936 revealed a high-strung lad of 9 years, short for his age and light for his height, with poor posture and poor muscle tone. The mucous membranes of the nose were grayish red and edematous. The turbinates were enlarged. The conjunctiva of the lower lids was edematous. The nose and eyes were rubbed frequently.

The face was triangular. There was lack of expansion forward, laterally and vertically. There was a well marked dental deformity which was described by the orthodontist as follows:

Class of malocclusion—Neutroclusion (Class I)

Arch relation—Normal

Maxilla—Bilateral contraction

Premaxillary protrusion

Central incisors protrude with diastema

Lateral incisors retrude in lingual version

Mandible—Bilateral contraction

All incisors badly bunched.

The remainder of the physical examination revealed no significant abnormalities.

A diagnosis of perennial allergic rhinitis was made and studies to determine the etiological factors were begun. Skin tests revealed positive reactions to house dust, grass, plantain, elm, cottonwood, oak, maple, poplar, pigweed, sycamore and ragweed pollens, and to all spices, almond, anise, artichoke, asparagus, banana, black walnut, barley, Brazil nut, carrot, cauliflower, cherry, cucumber, egg, egg plant, grapefruit, kidney bean, lima bean, mustard, navy bean, onion, pea, peanut, plum, poppy seed, potato, spinach, squash, tea, and turnip.

Consideration of the history led us to believe that the reactions to house

dust, grass and ragweed pollens were clinically significant. The remaining pollen sensitivities were considered negligible for the time. Their significance would be determined by the boy's symptoms when each suspected plant was in bloom and its pollen was in the air.

Were the positive food reactions significant? The history indicated that there had been marked clinical food sensitivity in infancy and young childhood. This was borne out by the disturbance in facial as well as general growth.

X-Ray pictures of the hand and elbow revealed light mineralization of the bones, recent scorings at the lower end of the radius, light muscle shadows and moderately clear subcutaneous tissues.

The presence of the scorings and the poor mineralization indicated active food sensitivity.

Consideration of all of the findings led to the following plan of management.

1. Avoidance of house dust by the patient, requiring a dust free sleeping room at home.
2. Immunization with house dust, grass pollen and ragweed pollen, at least one year's work.
3. Diet to be free of nuts, spices, peas, beans, asparagus, barley, cauliflower, egg, potato, spinach and squash.
4. A carefully planned, well-rounded diet was instituted.

This plan was started on October 23, 1936. There was almost immediate relief from the nasal symptoms. Within three months the mother volunteered the information that behavior had improved significantly.

The orthodontist reported that the jaws responded adequately to his manipulations.

X-ray examination of the hand and elbow at intervals showed increasing mineralization and loss of scorings. After one year of avoidance of the foods listed above, potato was added to the diet. No symptoms were observed. Beans and peas were next added, and again no symptoms developed. The x-rays shortly thereafter, however, showed new scorings, and mineralization was lighter so these foods were again removed from the diet.

This boy is still under treatment despite the absence of symptoms for over a year. He still needs a diet because of food sensitivity, a dust free room and pollen treatment. There has been marked improvement in his behavior and in his schoolwork. He is symptom free, but the records show that he is still asthenic and that he lags in height and weight.

B. S., aged 11 years, 9 months, was first seen on March 29, 1934 complaining of full summer hay fever, with nasal stuffiness in the winter months.

His allergic difficulties began at 3 weeks of age when, because of stertorous breathing, a diagnosis of enlarged thymus was made and x-ray treatment was instituted. Colic began at 7 weeks. Adenoids were removed at 3 months of age. Eczema began at 1 year and continued till the third year. There were frequent head colds from the first year and, from the seventh year on, definite hay fever appeared.

In 1933 he suffered a fracture of the humerus following an insignificant

bump on the shoulder. Orthodontic management of the malocclusion was continuous from 1930 to 1933 but little had been gained as there was failure of good bone formation in the jaws. This was due to poor mineral reserve in the bones as evidenced in roentgenograms of the hands.

Studies from the allergic standpoint proved him sensitive to grass pollen, ragweed pollen and house dust, and suitable management was carried out over three years' time. The symptoms became progressively less marked, mineral reserves increased, a good result was obtained by the orthodontist and he was discharged in September, 1937.

These two cases illustrate quite well that the constitutional disturbances of active allergy affect the work of the orthodontist. Proper management of early allergy may prevent much malocclusion. Proper treatment of active allergy is of great aid in restoring the constitutional vigor of the oral tissues.

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