

The Angle Conception of Class II, Division I Malocclusions

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"A picture is finished," wrote Whistler, "when all trace of the means used to bring about the end has disappeared." A child, in a way, resembles a marvelous painting or piece of sculpture. Pieces of sculpture and paintings are products of artists. The child is 'living sculpture' and God has been the artist. The little face of that child, fashioned by the great master, was designed to be perfect, but through misuse or accident often becomes damaged. What are we to do? What are our qualifications as scientific men to repair God's work?

It is the purpose of this paper to give Dr. Angle's concept of a very prevalent form of damage or as we call it, Malocclusion, Class II, Division I,—in such a way that you will better appreciate the normal, the treatment given and the appliance used. The latter will be demonstrated in the clinic, later.

First, let us define Class II, Division 1, malocclusion as found in the seventh edition of Angle's "Malocclusion of the Teeth". Class II, Division 1 malocclusion is characterized by a distal occlusion of the teeth of both lateral halves of the lower dental arch. The lower molars have taken this position on their eruption and locking. The first permanent molar is the first permanent tooth to erupt. It must follow that if its position is incorrect the teeth that erupt, both mesially and distally to it, will also be incorrect in their positions. It is evident that if the lower teeth are distal in their relation to the skull the lower front teeth will not have occlusion with the lingual surfaces of the upper anterior teeth, and so these lower anterior teeth will become extruded. The developing mouth of a child is most prone to promote extrusion when the anterior teeth are not opposed. In Class II, Division 1 malocclusion we find the lower teeth with an exaggerated curve of Spee and the incisors striking the rugae of the hard palate, lingually to the maxillary incisors. The upper buccal teeth are extruded also to produce an inverted curve of Spee in the maxillary arch and the upper incisors overlap the lower incisors to such an extent as to sometimes shield them from labial view.

The positions just described are of the crowns of the teeth. What of the axial relation? Some men have disregarded the axial position of the teeth as unimportant. Angle always maintained that it is of prime importance. The first movements in progressive malocclusions are always axial and only after definite malrelation has been reached do bodily movements take place. Those familiar with the various forms of anchorage know how much easier teeth move through simple anchorage. In Class II, Division 1 there is a perverted axial relation of the upper teeth only in the first stages of the malocclusion. The inclination is toward the labial and mesial. The same is true in the lower arch. A studious consideration of the mechanics of occlusion will readily show that after the teeth have reached a mal-relationship of a full premolar tooth another movement takes place which is of bodily character.

Bodily movement of teeth is difficult to secure with orthodontic appliances. When it does occur there is a change in the bony frame-work, hence the necessity of early treatments. Because of lack of normal forward bodily movement of the lower teeth the mandible is undeveloped. It is necessary for the orthodontist to secure bodily movement of the lower teeth to develop the mandible, because this class of malocclusion is so progressive. Angle could foresee the necessity of early treatment and he set about to invent appliances that could be used upon deciduous dentures. The appliances that he perfected are readily adaptable to even the smallest mouths but they require a definite technique and rather delicate handling.

I wonder if I can give you a picture of these little patients who come to us with this form of malocclusion. All of them have characteristics that, in a general way, are descriptive of the group as a whole. As a rule they are pale, one would say lacking in hemoglobin. Most of them are underweight. They are easy victims to head colds, so much so that one is concerned about the condition of the sinuses. Many of them are mouth breathers and a peculiar thing regarding this factor is to find that most of them have had their tonsils and adenoids removed and yet normal function of the nose has not been established. There is a thickened lower lip and an underdeveloped and inactive upper lip and, to complete the picture, let us add that they are, as a rule, extremely nervous.

Orthodontists have been prone to look about the mouth for the cause of this malocclusion. Thumb sucking, lip and nail biting, continuous use of a peculiar habit and, more recently, pillowing of the face, this bringing

pressure upon the buccal portions of the arches, have all been described as probable causes. But all of us know of children who have some of these habits and use them extensively yet without apparent injury. Because of the general condition we must look for a primary cause. Dieticians would have us consider the importance of vitamins. Calcium and phosphorous fixation is evidently influenced by foods. Certainly the intestinal tract is made active or sluggish by food selection. Some good authorities have maintained that teeth will not be influenced to any alarming extent providing there is a proper mineral content in the bones. They even account for the nervous habits through these deficiencies. What about the endocrines? They are coming in for their share of attention and will certainly bear observation. Endocrinologists have evidence that the disturbance of these glands is more prevalent in children than is suspected. Lack of balance in these secretions we know will produce malformations of the dentures. Chronic infection of the sinuses retards development. We know that these infections are numerous and the secretions from an inflamed sinus will keep the adenoid tissue in such an irritated and swollen condition that breathing through the nose is difficult if not impossible, hence the mouth breathing. It is known that air pressure in normal breathing is a factor in facial development. Plug up one nostril of a puppie's nose and that side of his face will cease to develop normally. We cannot ignore normal function of any part. This leads us to a consideration of the function of the muscles of mastication, the muscles of expression, and the muscles of deglutition. The soft and smooth quality of food, from refinement in its preparation, has made it practically unnecessary for teeth to function as organs of mastication. The nature of our food today gives these muscles of mastication a perverted function while the muscles of expression, as we all know, are overstimulated. The excitement of excessive social activities brings about special facial muscular activity. Some men have thought these muscles to be the cause of malocclusion. The muscles of deglutition are very active and their influence upon the denture during active swallowing is tremendous. They are often injured through tonsil lesions and operations. We should be able to recognize these conditions.

It is not difficult for us to know what has taken place after the abnormal locking of the first permanent molars nor is it necessary to invent ingenious devices to label a diagnosis as scientific simply because it is machine made. Nor is it necessary for one to be crushed with a steam roller to bring home appreciation of the laws of gravitation and so in diagnosis the position of the teeth is readily detected when they are out of balance, even by the untrained eye.

Dr. Angle's greatest contribution to the science of orthodontia was his conception of the line of occlusion. Into this classic definition goes all of the understanding that orthodontists have at present, and all of the knowledge that will be theirs in the future. If you are not familiar with this classic I implore you to read it and study it. The clearness and thoroughness of this definition makes it impossible to add or subtract words without detracting from the full meaning. I may tell you in my own words the understanding I have of the line of occlusion that is designed in the embryonic stage and persists throughout life. No one is able to lay his hands on it and say "this is the line of occlusion", for its form and position is determined by many factors. There are various types of individuals, differing in their entire anatomy from one another, yet, for each, there is a line of occlusion which is always in perfect harmony to their general and architectural plan. In ideal articulation the teeth are in harmony with this line but they are always moving; even though slightly, and the teeth may occupy positions which are not at equilibrium with the forces that act upon them. The line of occlusion, however, is always at equilibrium and in harmony with every force. There never has been an exact duplication in nature. We can then conclude that the line of occlusion in various individuals differs. We think of the line of occlusion as an ideal of perfection, in perfect balance with all of the forces that play upon it and these factors govern its location. The size, the form, the position are all influenced by the inherited type of the individual. It must not be thought of as impossible to visualize the line of occlusion for, with the proper degree of knowledge, it may be so closely approached that for all practical purposes it may be utilized as the goal for which we are working. It may be thought of as an ideal for every orthodontist and one's correctness in visualizing it will determine the possible success in the treatment of malocclusions.

Angle idealism, then, means there shall be a full complement of teeth and each tooth shall be in its correct position in the bony framework, depending upon the type of the individual. Axial position, muscular activity or tension, forms of the teeth and arches are all factors entering into this proposition. The various changes that we see in the face during the development of the sinuses and the modifications occurring in the transition from the deciduous to the permanent dentition are biological facts that every orthodontist should be thoroughly familiar with. Early treatment, while difficult, prevents perverted development of the arches and makes it possible to correct cases that might otherwise call for extraction which, of course, would be a compromise treatment.

The next factor of prime importance to consider is treatment. Everyone agrees that the ideal force for favorable tooth movement is one that is continuous and gentle. With these points in mind the newest Angle appliance, the Edgewise Arch Mechanism, was designed. The appliance is so efficient that all the lower teeth may be used for stationary anchorage, and the intermaxillary force tends to move them bodily through the bone, stimulating its growth. Naturally, as individual tooth movements are not being effected, there is less prolongation of treatment. The upper arch treatment is also ideal in that all of the teeth may be moved through simple anchorage, also shortening the time to a matter of just a few months instead of two or more years. Rotations and other individual tooth movements may be secured coincidentally without subjecting the patient to prolonged treatment. Each tooth is banded with a delicate, efficient band that does not impinge upon the soft tissues but does protect the tooth against decay during the shortened period of treatment. The stability of the appliance minimizes the displacement of bands and the breakage of appliances. With positive force control, inflammation is seldom encountered. Inflammation is unphysiological and is a warning that the tissue is overtaxed. The Edgewise Arch is ideally formed according to the type of movement desired and the form of the arch required. This ideal form is determined by exact measurements of the teeth within the mouth and, from its first application, there is always a continuous gentle force directing the denture units toward normal occlusion. The protection afforded each tooth by the cemented band, together with the much shortened period of active treatment, has made it possible to produce results without the serious misfortune of tooth decalcification.

Treatment is important and necessary but we can also say the same thing of retention. Treatment is active; retention is passive. It is only during this period of passive treatment that the rebuilding of the bone spicules takes place,—that is bone spicules that are built parallel to the forces of occlusion. During active treatment the spicules are built parallel to the force of the appliances. The length of time required for retention depends upon many factors. It is evident that the etiology of the perversion must be understood and removed, and that there be perfect balance between all the forces acting upon the teeth before retaining appliances can be removed.

A dentist recently stated that he could tell practically all patients who had received orthodontic treatment. They either had a toothy appearance, lines of decalcification on the teeth, inflamed gums, root resorptions or the orthodontist had resorted to extractions. All of these criticisms are justified to some extent because of the imperfections in many of the methods employed

in orthodontic treatments. But by the earlier treatment of cases, when indicated; by the mass movement of teeth, with gentler and more positive force control; and by placing each tooth in its correct relationship to the cranial anatomy, all of this criticism can be avoided. The orthodontist should also be alert to all the etiological factors, either intra or extra oral, and he should have a reliable means for their correction. While the orthodontist is not a physician it is within his field to recognize systemic factors, especially those conditions that effect bone, and see that they are given the proper attention by competent authorities. Only when orthodontists have reached the stage where they regard the mouth as an organ of digestion, a part of the human body, instead of seeing only the individual teeth and considering them like unto so many pickets to align, will they stimulate the respect that is due practitioners of an art and science so fundamental in character.

When that day arrives, and let us hope that it may be soon, then it may be said of our cases, as Whistler said about real pictures,—finished, without a trace showing of the means used to bring about the completion.

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