

The Orthodontic Curtain

RICHARD S. HAMBLETON, D.D.S.
Pasadena, California

What do we mean by the orthodontic curtain? Actually we are referring to the soft tissue or the integumental profile. Specifically, we are referring to the nose, the lips, the chin, and the cheeks.

The following is a review of the literature on this important part of our work.

The importance of the curtain of the lower face lies in five significant areas according to Burstone¹: speech, respiration, digestion, social acceptance, and psychological normalcy. Certainly orthodontics has a goal of creating a functional occlusion, and with this follows a harmonious soft tissue profile. Sometimes this second objective is not easy to attain because of the variation of curtains of soft tissue that appear with malocclusions. These variations come about because the underlying structures are out of balance and also because the thickness, length, and tone of soft tissue varies with each individual. There is no question in this age of orthodontics that patient analysis must include soft tissue as well as dento-skeletal diagnosis.

According to Ricketts³, Reidel sent out soft tissue outlines to many orthodontists for evaluation and received comments such as good, poor, and fair but no suggestions for a method of evaluation that would separate balance from imbalance or harmony from disharmony. This, I feel, shows that orthodontists are not concerned enough about facial appearance to make it part of their diagnostic procedure.

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We should ask ourselves the age-old question of what is right and what is wrong when we speak in the realm of appearance. Social acceptance is unquestionably and unfortunately predicated upon appearance in many parts of our society. What is considered right and what is considered wrong have been changing since time began. This can be demonstrated by reviewing art through the ages to see what was considered to be beautiful.

One of the main purposes of orthodontics today is to produce an acceptable appearance of the soft tissue curtain. It happens, however, that there is no stereotype curtain that will fit all skeletons. There is no formula or analysis which will give us a soft tissue line that will please all orthodontists. The face that we believe to be pleasing is not the same for each orthodontist, and, as Subtelny² says, it exists only in the "mind's eye" of the individual practitioner.

What kind of faces do our patients or the public like today? When we have satisfied the functional aspects of our treatment of the denture, our second consideration should be the esthetics of the teeth and face and what the public likes. Shall we choose the Hollywood starlet with the gaunt look, or the fashion model in the latest magazine.

It certainly seems in this day and age that we prefer what is considered to be a flat profile. The movie stars illustrate this; the fashion models, male and female, show it. Even the faces chosen by business men show a straight or flat profile. Be this as it may, the flat or not full profile of the lip area

does not fit every individual. We cannot stereotype faces this easily, and certainly the "mind's eye" of every orthodontist does not see the same flatness or fullness in every profile. The important facts that we must know are what we wish to accomplish with the soft tissue and what will happen to the soft tissue curtain with or without treatment. These are the pertinent facts and, regardless of what we have in our mind's eye about the profile, we must take special care to include it in our diagnosis and treatment planning. If we are to consider soft tissue in our planning, then we must know what will happen to these structures. We must understand what direction growth patterns and other changes will take in the soft tissue of the face.

Let us consider some facts that have been proved by researchers and clinical orthodontists. There is no question that what we feel is within the normal for the soft tissue curtain is dependent for perfection on the relationship of the mandible to the maxilla. Björk,⁶ Coben⁵ and others have said that the face becomes less convex with age, which only means that the denture becomes more upright with maturity. The mandible during this time grows and becomes more prominent. Consequently, with general growth from birth to maturity, the face becomes more concave. Male profiles, of course, become straighter than females because the male chin grows to a greater degree, even though they usually start later. Subtelny² tells us that despite these changes, points A and B, the dividing lines between the alveoli of the maxillary and mandibular bone, will not change after ages seven to nine without orthodontic intervention.

The soft tissue covering the mandible or the chin follows the dentoskeletal growth and comes forward accordingly. The soft tissue of the maxilla does not

follow the bony structure; as the bone becomes less convex the tissue here grows thicker.

To summarize these important points, we find that the maxillary bone becomes less prominent relative to the rest of the skeletal profile, but the soft tissue becomes more convex or thicker. The mandible comes forward and so does the soft tissue covering it. This will happen regardless of orthodontic treatment. This gives a flattening of the convexity of the face with normal growth.

It has been demonstrated that the nose grows downward and forward through adolescence. Subtelny⁷ illustrated this with a line projected from nasion to the tip of the nose. He then superimposed tracings on a line connecting nasion and point A registering on nasion. As the nose grows it brings the lip forward with it. The nose seems to grow in the same manner for males as well as females, in steady progression. This is different from bone growth in the nose that seems to come in spurts. The growth spurt of the nasal bone will show a definite elevation just below the bridge of the nose. With all of this change there is a lateral thickening of the nose that is somewhat less predictable.

Next let us consider the lips which are really the middle part of the curtain we speak about. Being the middle of this so-called curtain, the lips have an important part to play in the harmony of the face. The upper lip shows growth away from the palate. Subtelny⁷ illustrated this by measurements from the palate to the upper lip. The lower lip shows growth away from the mandibular plane.

This lip growth, both upper and lower, is continuous to about the age of eighteen years for both boys and girls. Subtelny⁷ also demonstrated that there is a definite thickening of the

upper lip in the vermilion portion, slightly greater in boys than girls. Ricketts calls the growth of the lips a one-half to two rule. One-half millimeter of vertical growth will occur about every two years, or one millimeter every four years.

As we stated earlier, our greatest influence on soft tissue is in the area of the lips. Retraction of the upper teeth will show a dramatic lip change. There will be not only retraction, but also thickening. When Tweed became concerned with facial esthetics, he proved beyond any question of doubt that change in the lips could be brought about by lower incisor retractions.

Certainly when treating patients, most of whom are growing young people, we must take into consideration these factors of growth that are occurring directly around and over the structures with which we are working. The amount of growth change, of course, will be greater in the curtain structures for the seven or eight year old than they will be for the teenager. The face that appears somewhat full at seven may lose a great amount of this as the maxillary bone recedes; the lips grow longer, the nose grows forward, and the chin becomes more prominent. Downs⁹ says, "there is a facial pattern that represents a mean or an average form, but the deviations on both sides represent the variations one must reckon with when appraising balance and harmony. Excessive deviations of the mean and extremes found express abnormalities of relationship which will be evident as disharmonies or unbalance." Dental disharmony and unbalance will, of course, manifest themselves in the soft tissue.

A discussion of soft tissue would not be complete without some mention of the individual factors that have to be taken into consideration for each patient. Tissue tone, abnormalities, smil-

ing, muscle coordination, environment, tissue color, and myriad other problems and situations make each case different and challenging.

The soft tissue has been measured in a variety of ways. The literature shows how measurements can be made on cephalometric tracings to show tissue growth and changes that have taken place during treatment. All of this does not solve the problem of soft tissue diagnosis in the treatment planning stage.

Robert Ricketts⁸ suggested the esthetic plane which is as follows. In Caucasians, by the age of adulthood, the lips should be contained within a line from the chin to the nose (Figure 1). The mouth should be closed with no strain and the contours of the lips should be smooth. The lower lip should fall slightly ahead of the upper lip when related to this line. This reference plane takes into consideration the soft tissue area with which we are most concerned. It touches the nose and chin which are important factors in profile development. It is less spe-

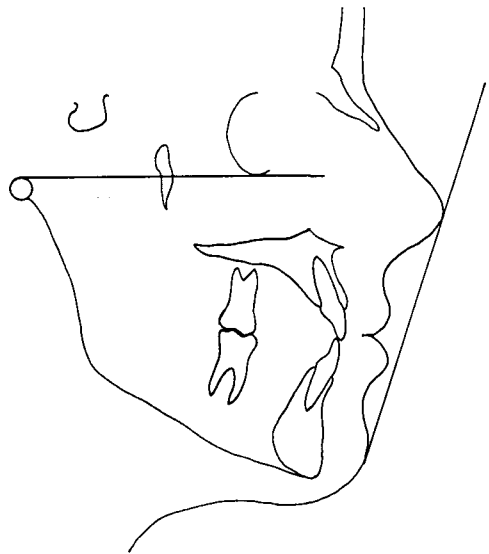


Fig. 1

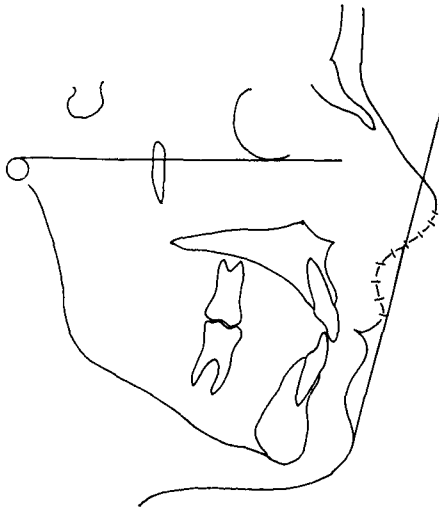


Fig. 2

cific about the lips, as only containment is important with the lower lip slightly (2 mm) ahead of the upper. Ricketts feels that if the lower lip lies back of the upper lip in relation to his plane, the profile appears overtreated.

Cecil Steiner¹⁰ has suggested a plane from the chin to the middle of the S

formed by the lower border of the nose and the upper lip (Figure 2). He said that the lips often fall on this line, and that lips ahead of it would, on an average, be too full; those falling behind it would give too flat an appearance relative to other parts of the profile. In this analysis the lip position is more definitely defined and takes into consideration a large or small nose, a large or small chin, and harmonizes them with the lips.

The third man, Reed Holdaway¹¹, says that a straight line on a tracing from the point of the chin tangent to the upper lip creates an angle with line NB which can be measured and used for soft tissue diagnosis (Figure 3). He calls this the H angle. Holdaway says that when the ANB angle is one to three degrees this H angle should be seven to nine degrees to produce the profile he feels is pleasing. This analysis is flexible and, if the ANB angle is greater or smaller than one to three degrees, then the same amount is added or subtracted from the H angle.

Whether you choose to analyze the face before treatment by observation, by photography, by cephalometric tracing, or by direct measurement, keep in mind the age and growth factors inherent in the face. The drape of the soft tissue curtain of the lower face can be changed dramatically by orthodontic treatment. It must be remembered that many changes will take place regardless of orthodontic treatment. All of these points must be considered when the dentoskeletal analysis is made.

200 South Oak Knoll Avenue

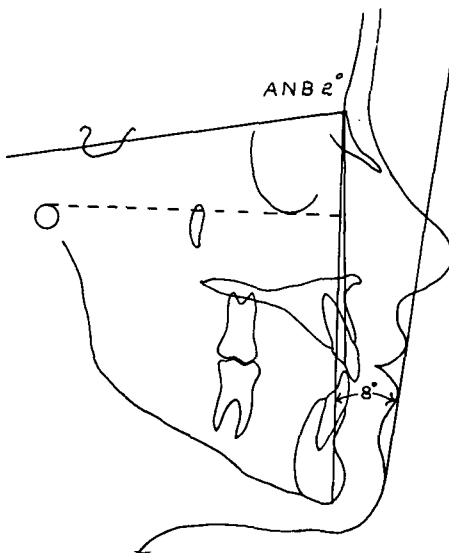


Fig. 3

1. Burstone, Charles J. The Integumental Profile. *Am. J. Ortho.* January, 1958.
2. Subtelny, Daniel J. The Soft Tissue Profile, Growth and Treatment Changes. *Angle Ortho.* 31:2 1961.
3. Ricketts, Robert. Planning Treatment

- on the Basis of the Facial Pattern and an Estimate of its Growth. *Angle Ortho.* 27:1, 1957.
4. Angle, Edward H. Treatment of Malocclusion of the Teeth, Seventh edition, 1907.
 5. Coben, S. E. The Integration of Certain Variants of the Facial Skeleton: A Serial Cephalometric Roentgenographic Analysis of Craniofacial Form and Growth. *Am. J. Ortho.* 41:407, 1955.
 6. Björk, A. The Significance of Growth Changes in Facial Pattern and Their Relationships to Changes in Occlusion. *D. Rec.* 71:197, 1951.
 7. Subtelny, D. J. A Longitudinal Study of Soft Tissue Facial Structures and Their Profile Characteristics, Defined in Relation to Underlying Skeletal Structures. *Am. J. Ortho.* 45:6, 1959.
 8. Ricketts, Robert. Personal Communication.
 9. Downs, W. Variations in Facial Relationships: Their Significance in Treatment and Prognosis. *Am. J. Ortho.* 34: 812, 1948.
 10. Steiner, Cecil. Personal Communication.
 11. Holdaway, Reed. Personal Communication.

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