A Modification of the Tennison-Type Lip Repair

THOMAS D. CRONIN, M.D., F.A.C.S.

Houston, Texas

After experience with the Blair-Brown (1) procedure, the Brown-McDowell (4) modification, the LeMesurier (6), the Tennison (10), and the Millard (8), my feeling is that the Tennison-type procedure is perhaps the best all-around operation for most single (unilateral) cleft lips. The Millard operation comes next, with possible precedence in the case of incomplete clefts, and definite precedence for very slight clefts.

In 1952, Tennison (10) described his operation with emphasis on his method of marking the lines of incision with a wire stencil. I believe that his most important contribution was not in his use of a stencil, but rather in the preservation of the cupid's bow by lowering the peak in the margin of the cleft. In his paper, he merely mentioned 'preservation of the cupid's bow' as one of the requirements of a good lip operation. In 1953, Marcks and his associates (7), in 1958, Hagerty (5), and in 1959, Randall (9) further elaborated on this type of operation, explaining the rational of the procedure together with accurate methods of marking.

Referring to Figure 1 A, it is difficult to fit the pointed flap C-D-X into place and to secure accurate alignment of the vermilion ridge and proper thickness of the vermilion. In addition, there is a tendency, sometimes, for confusion of the vermilion ridge with the oblique scar C-D as they join (Figure 2).

Since 1956, I have terminated the oblique incision C-D 1 mm above the vermilion. The latter is then crossed at right angles D-E, simplifying the adjustment of the vermilion both as to thickness and alignment (Figure 1 B). Tennison (11) has made a somewhat similar change.

Repair of the lip is usually delayed until the infant has attained a weight of 10 pounds or more, and is usually performed under intratracheal anesthesia, although, for those who prefer, local anesthesia may be used.

Dr. Cronin is Clinical Professor (Plastic Surgery), Baylor University College of Medicine; Associate Professor, Post-graduate Medical School (Plastic Surgery), University of Texas; and Chief of Plastic Surgery Service, Hermann Hospital, St. Luke's Episcopal Hospital, and Texas Children's Hospital. He is Diplomate of the American Board of Plastic Surgery.

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FIGURE 1A. Usual appearance of a Tennison-type repair with the scar joining the vermilion border obliquely.

FIGURE 1B. Modification with scar C-D ending 1 mm above vermilion so that a vertical cut D-E can be made across the vermilion.



FIGURE 2. B.J., left, and W. T., right, two children demonstrating confusion of the vermillion ridge by the oblique scar of the usual Tennison-type operation.

Technique

In 1959, my associate, R. O. Brauer, and I (2) observed the tendency of the lip on the cleft side to become too long in a vertical direction as the child grows. This has been observed as a result of all methods and especially of the LeMesurier procedure. Therefore, the plan to be presented deliberately results in a 1 mm shortness in the line of repair (Figure 3).

The medial, or uncleft side, should be marked first. Then the following steps are suggested. a) Measure the length of the uncleft side of the lip as described by Brauer (3) (Figures 5, 6, and 7). Locate A'' at the base of the columella. Place E'' at the peak of the cupid's bow. The distance A''-E'' is the vertical length of the lip and, in infants of about two months old, is about 10 mm. Therefore, the planned length of the



FIGURE 3. Left, C. C., a child with a lip apparently too short on the repaired side. Right, C. C. one and one-half years later. Spontaneous correction with growth.



FIGURE 4. Left, C. H. a few days post-operative lip repair. The lip is slightly long in the line of repair. Right, C. H. six years later. The lip is even longer on the repaired side.



FIGURE 5. FIGURE 6. FIGURE 5. Diagram of method of marking lines of incision. See text for details. FIGURE 6. Diagram showing how the lip is fitted together.



FIGURE 7. Left, D. G., markings for a modified Tennison-type operation. Right, D. G. two years later.

lip in the line of repair will be 1 mm less, or 9 mm. b) Identify the center of the lowest part of the cupid's bow and label it X.

c) At a distance equal to E''-X, locate the peak of the cupid's bow on the cleft margin and label it E. This point should be near the end of, but still on, the vermilion cutaneous ridge (7). A continuous vermilion cutaneous ridge is essential because a gap immediately calls attention to the lip. d) Draw a line at right angles to the vermilion ridge through E, extending 1 mm on to the skin to D and all the way across the vermilion. e) Draw a line B-C about 4 mm in length, beginning at the vermilion border and passing through point D. (Experience has shown this to be a suitable length.) This line should form a somewhat acute angle with the vermilion ridge so that the flap C-D-E-X will rotate downward easily. If the line C-B is made at 90° or more it cannot be rotated downward as well. Line C-B should never extend beyond A''-E'', since this would result in an increase in the vertical length of the normal side of the lip. Line C-B is 1 mm longer than line C-D. For practical purposes, D-Eis the same length as D-B.

f) Point A is placed at the base of the columella. Some help in locating this point is obtained by placing a small skin hook in the angle between the columella and ala and lifting up to a level corresponding with the normal side. Points A and B are connected. g) On the cleft side, place E' at the most medial point where the vermilion is still of full thickness and the vermilion ridge is still present. h) Draw a line at right angles to the vermilion ridge through E', extending 1 mm on to the skin to D' and all the way across the vermilion. i) Point A' is located at the base of the ala so that, when it is approximated to A, the ala will be symmetrical with the normal side.

j) The normal side of the lip is 10 mm, but as mentioned previously, it is planned to make the lip 1 mm shorter (or 9 mm in length) on the repaired side. The distance A'-B' must be equal to A-B. The sum of A'-B'

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and D'-E' subtracted from 9 mm, the planned length of the lip on the repaired side, gives the dimension of the base of the triangular flap B'-C-'D'. One compass is centered at A' with the points separated by the distance equal to A-B. Another compass is centered at D' with its points set at the desired width of the base of the flap. Point B' is placed at the point where these two arcs intersect.

k) Point C' is located as follows: C'-B' must be equal to C-B and C'-D' must be equal to C-D. With two compasses set at these distances respectively, points are centered at B' and D' and the point of intersection of their arcs is marked C'.

When the points have been marked, as directed, on the skin surface, a #25 needle is dipped in Methylene blue and the skin is punctured at each point, thus making a mark which will not wash away. These points are connected as shown in the diagram.

One to $1\frac{1}{2}$ cc of 1% xylocaine with 1:100,000 adrenaline is infiltrated *sparingly* in the sulcus and area of operation, being careful to distort the lip as little as possible. After 8 to 10 minutes to get the vasoconstrictive effect of the adrenaline, the mucosa in the sulcus is incised and the lip tissues dissected off of the periosteum only enough to secure approximation of the lip.

Now, with a wooden tongue blade placed beneath the lip and held there firmly by an assistant, the lip is further fixed by pressure near the line of incision with the index finger of the operator's left hand. The lip is incised with a %15 blade, being careful to cut exactly along the lines and at right angles to the skin surface. The blade is pressed on through the lip to the tongue blade. If necessary, any small bits of tissue not severed by the knife are cut with a pair of pointed iris scissors. The cuts D-E and D'-E' are made all the way thru the vermilion, care being taken not to extend the cut into the depth of the lip beyond points Dand D', since this would have the effect of making the lines D-E or D'-E' too long.

The incision is extended up into the nose, as needed, beyond points A and A'. Now a 4-0 plain catgut suture is inserted into the muscle beneath the ala and columella and pulled snug to test for proper alignment. If satisfactory, it can be tied. Then the parts of the lip are interdigitated, one 4-0 plain catgut suture being used in the muscle to bring each point well into the opposite angle. No more muscle sutures are used. The various skin angles are next approximated with fine sutures and needle, such as 6-0 dermalon. The vermilion ridge is carefully aligned with a suture on each side of it, rather than in the ridge, thus avoiding the possibility of mutilating the ridge with a suture scar. The mucosal surface is sutured with 4-0 plain catgut, completing the repair. Some results of this technique are shown in Figures 8 and 9.

An antibiotic ointment is applied to the suture line, followed by a small dressing to take up the exudate. The dressing is removed at 24 hours and



FIGURE 8. R. L., before (left) and after (right) repair.



FIGURE 9. C. R., before (left) and after (right) repair.

the lip is left exposed. About half the sutures are removed on the third post-operative day and the remainder on the following day. The lip is supported for about a week after this with a strip of wide mesh gauze and U.S.P. collodion (not flexible).

Some vertical contracture usually occurs within two to three weeks, but this gradually stretches out within several months.

Summary

A slight modification of the Tennison-type lip repair is described in which the oblique incision, instead of ending at the vermilion border, is terminated 1 mm above the border. A vertical cut is then made across the vermilion, making it easier to align the vermilion border.

> reprints: Thomas D. Cronin, M.D. 5419 Caroline Blvd. Houston, Texas 77004

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