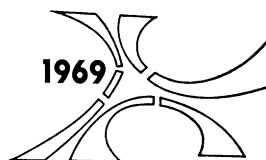


The Rotation-Advancement Operation of Millard as Applied to Secondary Cleft Lip Deformities



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The rotation-advancement principle in primary cleft lip repair, as designed and recommended by Millard since 1955, has been adopted by an apparently ever increasing number of surgeons throughout the world. Millard himself has written several papers on the surgical technique, and he lately recommended its use more extensively for wide complete clefts (9). Several refinements and modifications have been added to the original design (7), and the reservations against the method are gradually expressed with less enthusiasm.

These endorsements seem to prove definite advantages in the rotation-advancement approach to primary surgical repair of unilateral cleft lip. The advantages usually mentioned are as follows (5, 7, 10, 14): the method offers good possibilities for simultaneous lip and nose correction, for preservation and positioning of natural landmarks, tissue saving, non-conspicuous scars and less difficulty for secondary corrections.

The rotation-advancement technique in primary cleft lip repair is the routine method since 1960 at the Plastic Surgery Department of the University Hospital in Oslo. We get about 40 new unilateral cleft lip cases per year. Personally, I have used the rotation-advancement principle for all my primary unilateral cleft lip repairs (complete or incomplete) without exception since 1962.

Very early I also found it natural to apply the same principle in the correction of secondary cleft lip deformities, and since 1963 I have used the rotation-advancement technique, sometimes with modifications, in an ever increasing percentage of the total number of secondary unilateral cleft lip corrections, which in our Department counts up to about 70 per year. Both the immediate and the later results have been satisfactory, and so uniformly so that it seems a natural task to analyze the particular advantages of the rotation-advancement principle also for secondary corrections.

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The idea of also applying a rotation-advancement principle in the treatment of secondary cleft lip deformities appears to be not at all new. According to Millard (5), the late Sir Harold Gillies more than once expressed his approval of this principle, even before Millard's own advocacy of the primary cleft lip repair. Further, the secondary availability appears to be stressed by Millard in 1960 (5), by Schjelderup in 1963 (12), and by Wilkie (14) in 1969. The latter points to the similarity in principle between the rotation-advancement procedure for cleft lip and the "alar shift" operation of Gillies and Kilner for nasal correction.

The details of the rotation-advancement operation, whether applied to primary or to secondary cleft lip deformities, are well described by Millard and by several others. At one point, however, it seems to me that a very important detail has not been given enough emphasis by any author: the importance of the exact and firm suturing of the mobilized lateral lip muscles—over the cleft, underneath the nostril, and on to the medial bridge-head in the region of the anterior maxillary spine. If this suturing detail is not properly taken care of, one will not achieve the maximal advantages of the method; namely the correction of the lower anterior septum towards the midline, the raising of the columella towards the vertical position, nor the tension and muscle union in the upper part of the lip producing the natural pout, the fullness under the nostril floor, or the lifting and repositioning of the alar base.

Particularly the augmentation of the soft tissues in the cleft area provided by the medial advancement of lateral muscle bulk is just the clue which makes this method so useful in secondary correction of unilateral cleft lip deformities. This might be further explained by the primary pathologic anatomy of the cleft lip defect.

Some authors seem to accept that all parts of a normal lip are fully present but displaced in the cleft lip and need only be rearranged, but as Cosman and Crikelair (2) point out, the cleft lip problem includes an absolute deficiency of lip substance with the maximum of the tissue defect superiorly located beneath the nostril floor. On the other hand, the deformity of the nose seems to be due more to a faulty positioning of the elements of the nasal skeleton than to an actual shortness of their size and shape (Figure 1). This view was clearly described by Huffman and Lierle in 1949 (3).

A considerable part of the combined nasal-labial distortion therefore seems to be due to the tissue loss in the upper part of the cleft lip. The complete cleft will, of course, have no nostril floor at all and the secondary disarrangement of the nasal parts will be pronounced (11). In the incomplete cleft, the tissue loss will prove responsible for the floor of the nostril being attenuated and lowered, for the lack of a proper nostril sill, and for the muscular nonunion which even in the so-called subcutaneous incomplete cleft appears to be a typical feature (1).

This muscular nonunion, whether primary in infancy or secondary

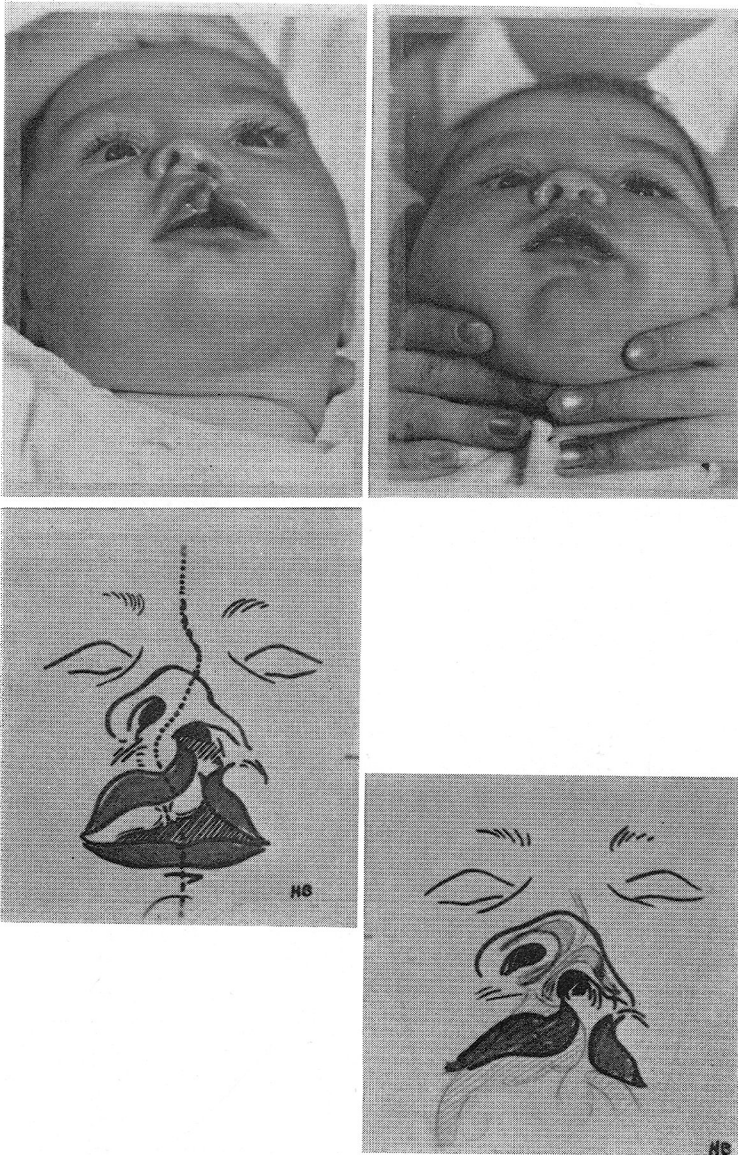


FIGURE 1. The primary unilateral cleft lip deformity, consisting mainly of a tissue defect high in the lip and a distortion of the skeletal framework causing a tilting of the nose. This shows a patient one week after primary correction by rotation-advancement technique.

following surgery, in my opinion, is one of the most important details in the mechanism of the cleft lip deformity. When the patient attempts to pout actively, muscular nonunion is demonstrated as the off-drifted cleft-side bulk of lip muscle appears to protrude laterally to the cleft

area, without having the normal, firm hold of the median structures. As shown in Figure 1, the primary effect of this muscular nonunion on the untreated cleft lip will be the deviation towards the noncleft side of the anterior maxillary spine, including the lower anterior septum and columellar base, altogether causing the typical tilting of the entire lower nasal framework. This tilting is further accentuated by the undergrowth and relative backward positioning of the cleft-side maxillary segment, as the cleft-side alar base will have neither a bony nor a soft tissue platform to level it with the contralateral one.

When a cleft has been closed previously, without an effective advancement and fixation of the lateral muscle element onto the median premaxillary structures, all the just mentioned nasal-labial deformities will be found more or less preserved in the so-called secondary cleft lip deformity. The discontinuity of the muscle under the scar will make the patient unable to pout his lip symmetrically, the cleft-side lip element appears to be drifted off laterally, carrying the alar base with it, all sliding down the slanting lateral surface of the under-grown maxilla. This often gives the impression that the cleft-side element is hanging much longer and lower than the up-hitched medial element. The cleft-side alar arch will appear flattened out, roofing the broad and horizontally-positioned nostril where the sill is missing and the floor is deepened. The lack of muscle union will further have caused the anterior maxillary spine and all its related median structures to keep deviating towards the noncleft side, tilting the nasal framework in the characteristic way. In addition to this, the previously closed lip may, of course, show the other typical features more related to details as philtrum, cupid's bow, and vermilion. The surgical paring of the cleft edges may have resulted in more or less discarding these structures, or leaving them present but askew. The scar itself may be unsightly, caused by the patient's inherent tendency to scar hypertrophy or by some fancy method used at the previous operation.

Whatever the predominant feature in the complex of secondary cleft lip deformity, the overall picture of the previously operated cleft lip patients will always tend to resemble that of the unoperated. The more of the primary defects and deformities which the previous operation has failed to correct, the stronger the indication will be to offer the patient a secondary operation. Having in mind the similarity between primary and secondary disfigurements, and accepting the definite advantages of the rotation-advancement operation in primary cleft lip correction, it seems to me a most natural consequence to apply this principle also in secondary cases.

All technical details in the operation shall not be mentioned here. They will be well known from Millard's descriptions (5, 6, 7, 8, 9), and should be performed accordingly. The immediate favorable effect one can expect on the philtrum and vermilion area can easily be imagined.

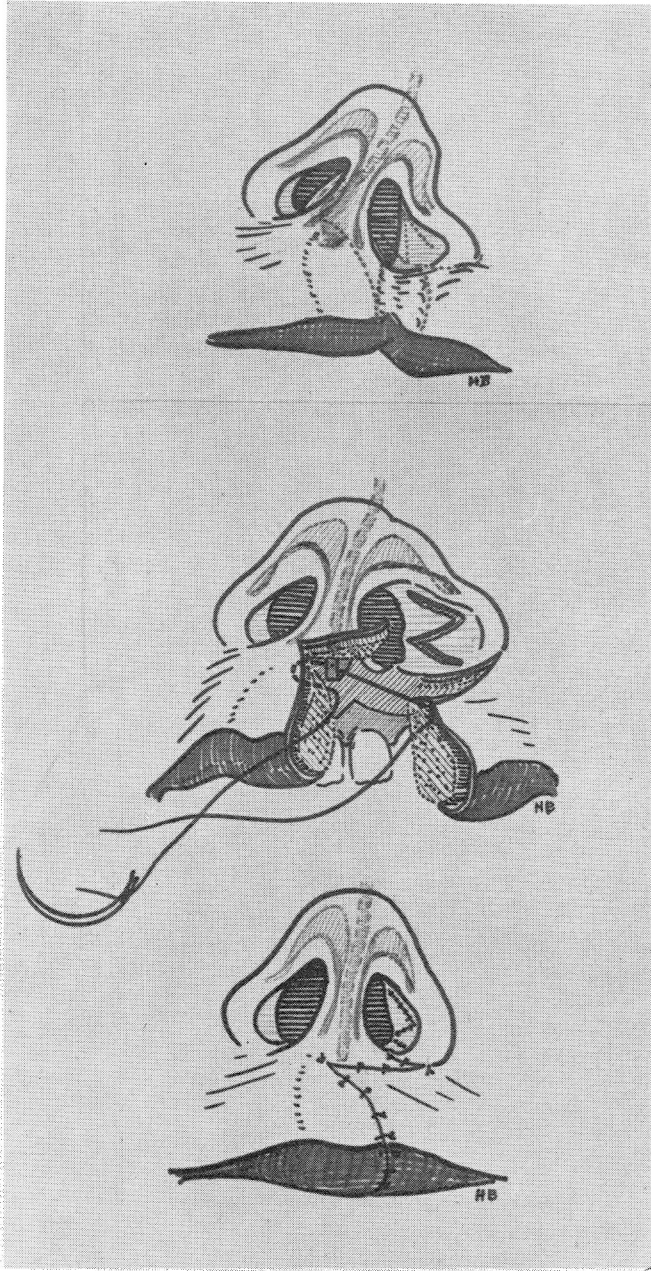


FIGURE 2. *Top*, the typical secondary unilateral cleft lip deformities, with tilting of the nose which is otherwise without actual defects, muscular non-union with off-drifting of lateral muscle bulk and contralateral drifting of structures in the columellar base. *Middle*, the key stitch in the secondary correction operation. *Bottom*, the possible end results. Note: The sketches are a little exaggerated.

The rotation-advancement principle has, however, a remarkably great value especially in the correction of the defects and deformities related to muscular discontinuity and nasal tilting. Particularly important then is a thorough undermining and mobilization of the lateral lip muscle element from the surface and pyriform aperture of cleft-side maxilla. As shown in Figure 2 and as I have stressed above, the upper corner of this

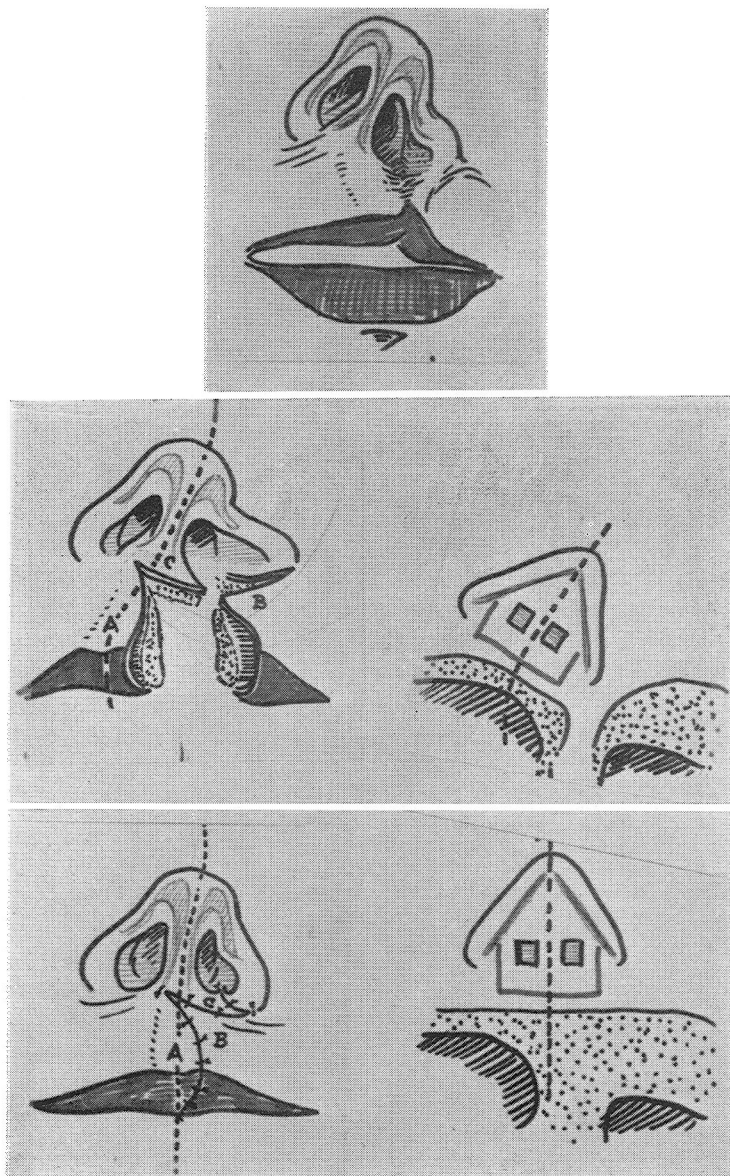


FIGURE 3. The rotation-advancement operation of Millard (see text).

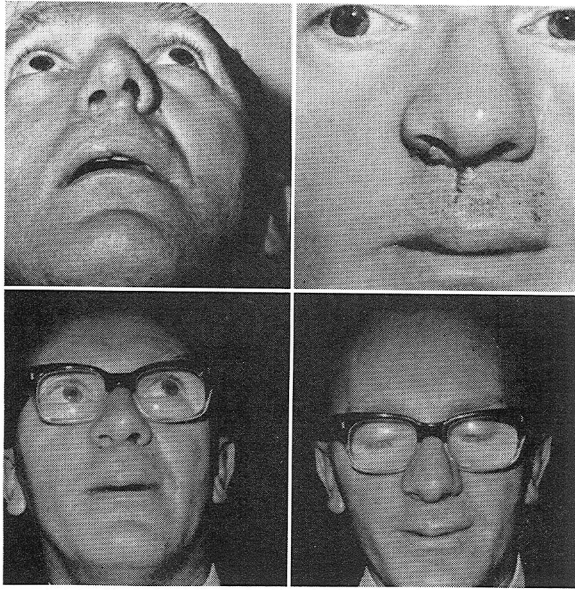


FIGURE 4. A photographic recording of a case in which the rotation-advancement technique has been used for secondary cleft lip correction, and in which no other correction has been done to the nose than a small Z-plasty inside the ala. A palatal fistula was closed simultaneously. *Top row:* Before and shortly after operation. *Lower row:* 4 weeks after operation.

lateral muscle element must be very carefully sutured to the median structures in the maxillary spine area, to which one gets access through the gap between flap A and flap C. This is the *key stitch* of the advancement procedure. It provides median fullness, labial symmetry, lifting of the lateral lip element, and a good soft tissue platform for the cleft side alar base, which is effectively repositioned with good symmetry to the noncleft side. Further, the key stitch can provide a considerable straightening of the columella and reshaping of the nostril, especially if one does, simultaneously, a little work to the deviating anterior septum and a Z-plasty inside the ala. These and other and more extensive nasal corrections (13) are particularly easy to perform during a Millard operation, when the lip and nasal floor are so thoroughly opened up. This advantage applies also to corrections of the anterior palate, such as closure of fistulae. I feel that the muscle closure in lip repair, especially the key stitch, should be done with non-absorbable sutures; I always use supramid. Figure 3 shows how the rotation-advancement operation of Millard, in my opinion and experience, can provide a soft tissue platform for the cleft-side alar base, almost eliminating the disadvantage of the cleft-side bony defect. This, together with the reduction of the columellar deviation, tends to counteract the tilting of the nose. The photograph shown in Figure 4 is a typical case.

In conclusion, I would like to mention that I believe that, as the primary repair is done with an approach which includes a firm and effective suturing of the lateral lip muscle component to the median structures underneath the columella, the secondary unilateral cleft lip deformities to come over the years will decrease in number as well as in degree.

Summary

The author has used for many years the rotation-advancement method of Millard in the correction of secondary deformities following previously operated unilateral cleft lips. The technique is considered naturally applicable to these cases according to the same principles as in primary repair. Particular stress is laid upon the muscular advancement and its median anchoring, as this detail is considered of principal importance. Nasal asymmetry and oro-nasal fistulae can easily be corrected through the same incisions.

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