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# The ultimate straight line repair for unilateral cleft lips

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**KEYWORDS**
Straight line;
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**Summary** The straight line repair for unilateral cleft lips developed following the negative long term objective and subjective findings in a group of patients whose defects were repaired using the Millard technique. No revisional surgery had been undertaken.

The straight line procedure achieves the aims of a cleft lip repair. These include, an adequate lip length on the cleft side, an inconspicuous scar not crossing anatomical boundaries, and an absence of notching of the vermillion border or peaking of the Cupid's bow on the cleft side. In addition, these aims are fulfilled while retaining an adequate Cupid's bow width in the majority of our patients.

This operation is easy to perform, reproducible and achieves excellent results from both an objective and subjective point of view.


The aims of a unilateral cleft lip repair are to achieve a lip length on the cleft side matching that on the normal side, an inconspicuous residual scar that does not cross anatomical boundaries, an adequate Cupid's bow width, an absence of notching of the vermilion border (whistle tip deformity), and there should be no peaking of the vermilion at the cleft side cupid's bow.

Although a great number of operations have been described for the unilateral cleft lip repair, none fulfil all the above criteria and in most cases require secondary operations in an attempt to achieve this described goal.

The Millard operation for unilateral cleft lip deformity,[1—4] with its various modifications, extensions and revisions,[5—8] is the most widely practiced repair used today. In a recent survey, a subjective and objective assessment was made of 20 late follow-up patients who had undergone a Millard repair of their unilateral cleft lips.[9] None of these patients had any subsequent revisional surgery. The results showed that 50% of the patients were unhappy with their scars in the upper 1/3 (crossed anatomical philtral column) and 35% were unhappy about the lower 1/3 of the scar (where there was peaking of the Cupid's bow). Many also complained of vermilion notching. The most interesting objective observation made was that the Cupid's bow width occupied a larger proportion of the total lip length

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(commissure to commissure) in the Millard-repaired lips as compared to a study group of normal people of similar ages.

One can separate each of these problem areas in the residual scar and analyse its likely cause.

1) A scar that crosses normal anatomical boundaries: The normal philtral column lies in the vertical direction and is either straight or has a very slight curve. Scars which break this line cross anatomical boundaries and this breach occurs in most types of cleft lip operations including the Millard repair. This scar often becomes more obvious as the patient gets older.
2) Peaking at the Cupid's bow on the cleft side: This occurs commonly due to scar contracture as well as an inadequate lip length achieved at the time of initial surgery.
3) Notching of the vermilion: It can be noticed that in all cleft lips there is a point beyond which the vermilion begins to narrow on each side of the cleft. The principle of retaining the entire Cupid's bow during the repair often results in the inclusion of the vermilion that has already started to thin. This invariably results in a notch at the vermilion border. Correction at the time of the operation often involves the inclusion of a Z-plasty which may create further irregularities.

In order to correct these problems so that the results conformed to the patient's desires, most of these patients required secondary operations. This took the form, in the majority of cases, of a full thickness wedge excision of the lip to include the scar. After realigning the lip structures, a straight line repair resulted.

It is also important to add at this point, that when considering excisional surgery for upper lip lesions, a wedge excision is always used if the lesion is small enough. This will ultimately leave a vertical straight line scar which follows the normal anatomical lines and leaves the best possible result.

## Aims and objectives

The long term problems seen in our series of unilateral Millard cleft lip repairs led to a prospective trial to simplify the procedure and achieve the following aims:

- A scar running vertically along the philtral column not crossing into the philtrum at any point.
- Lip height on the cleft side comparable to that on the non-cleft side.
- To avoid peaking at the Cupid's bow.
- To avoid notching (whistle tip) of the vermilion.
- To obtain a Cupid's bow width within the normal range.
- To achieve this with one operation.

## Operative procedure (Figure 1)

1. Measure the vertical distance from the nostril sill adjacent to the columnella along the philtral column, to the peak of Cupid's bow on the normal side (AB).
2. Mark a point C at the nostril sill on the cleft side. Points A and C are equal distances from the columnella. Points C and A will therefore represent the start of the philtral columns on either side and must therefore be symmetrical.
3. Mark the same distance from the sill on the cleft side to the vermillion (CD); this will pass the Cupid's bow peak and extend on to the Cupid's bow for a varying distance. Point D is invariably before where the vermillion border narrows.
4. Mark a point E on the nostril sill of the lateral segment that will result in the width of the nostril sill being equal to the normal side when the cleft is closed.
5. Point F is then marked on the vermilion border of the lateral lip segment such that lines EF, CD and AB are all equal (Figure 2). Point F will also extend beyond where the vermilion border narrows.
6. Points G and H are marked on the red line of Noordhof ensuring that there is sufficient vermilion to provide adequate fullness.
7. Full thickness incisions are made through the lip along lines CDG and EFH. The muscle is identified at the wound edges and released from any aberrant insertion.
8. The mucosa is then freed along the sulcus on either side.
9. Nasal correction can be performed if required.
10. The lip segments are then aligned and sutured in layers (mucosa, muscle, skin and vermilion) (Figure 3).

At the end of the procedure the resultant straight line scar does not infringe upon any anatomical boundaries, has an adequate lip length on the cleft side with no notching at the vermilion border. The only sacrifice is that the Cupid's bow width is compromised but stretches out over time as does the lateral lip segment.

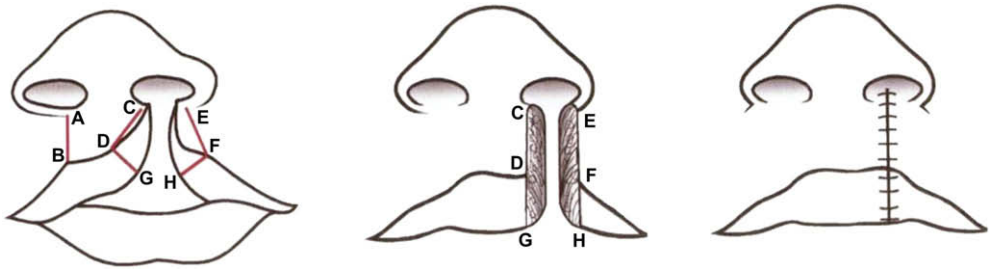


**Figure 1** Diagrammatic representation of the operation for the straight line repair.