

# How to eliminate bilateral cleft lip stigmata

## 30 year experience



Ann. Ital. Chir., 2017 88, 4: 282-287  
pii: S0003469X17027403

Patricia Cecchi, Maria Ida Rizzo, Oriana Rajabtork Zadeh, Daria Bucci, Mario Zama

Unit of Plastic and Maxillofacial Surgery, "Bambino Gesù" Children Hospital, Rome, Italy

### How to eliminate bilateral cleft lip stigmata. 30 year experience

**PURPOSE:** To report a surgical algorithm for the treatment of bilateral cleft lip stigmata.

**METHODS:** The investigators designs a retrospective study composed of patients with bilateral cleft lip stigmata. The surgical approach is on the basis of the severity of the deformity and of course the age of the patient. It consists in Simple scar revision with orbicularis muscle synthesis; Two dermal flaps tunneled in the central vermilion; Abbe flap. The investigators analyzes early and late complications, and performs the evaluation of the cosmetic appearance by a parent or patient himself/herself, a surgeon and a blinded third party observer.

**RESULTS:** The sample was composed of 351 patients. At short-term follow-up, viability of the flaps, function and morphology are good. At long-term follow-up, we observed significant improvement of the characteristics and profile of the patient's face and a normal function of the lips. We recorded a good scarring and a high satisfaction rate by evaluation of patients/ surgeon/ blinded third party observer.

**CONCLUSION:** The results of this study suggest that a surgical algorithm on the basis of the severity of the deformity and of course the age of the patient can represent an option of choice for most patients with bilateral cleft lip stigmata.

**KEY WORDS:** Abbe flap, Bilateral cleft lip stigmata, Cleft lip, Dermal flaps, Orbicularis muscles

### Introduction

Secondary deformities of the Bilateral Cleft Lip (BCL) are characterized by the absence of an important aesthetic unit - a proper philtrum. Severe cases can involve scar contracture, vermilion deficiency, and a tight upper lip with an excessively procumbent lower lip. The cleft lip-nose deformity with a short columella or the typical "whistling deformity" completes the picture of classical stigmata (Fig. 1). Frequently, secondary BCL deformity worsens with the growth because the inadequate development of the probium compared to the other facial structures (Fig. 2).

We would like to report our clinical experience with more than 350 cases of secondary Bilateral Cleft Lip (Table I).

### Materials and Methods

This study followed the Declaration of Helsinki on medical protocol and ethics. Hospital ethical approval was given. The investigators designs a retrospective study composed of patients with bilateral cleft lip stigmata. The surgical algorithm for bilateral stigmata correction is on the basis of the severity of the deformity and of course the age of the patient (Flow-Chart).

It provides: 1) Simple scar revision with orbicularis muscle synthesis, (Fig. 3) if there is adequate tissue in a patient under 5 years. 2) Two dermal flaps tunneled in the central vermilion to correct "whistling deformity", (Fig. 4) if the patient age is less than 10 years. 3) Abbe flap to reconstruct the whole aesthetic unit, (Fig. 5) if the patient is teenager.

Pervenuto in Redazione Maggio 2017. Accettato per la pubblicazione Luglio 2017

Correspondence to: Dr. Maria Ida Rizzo, V.dotto Gronchi 13, 00139 Roma, Italy (e-mail: mariaidarizzo@gmail.com)

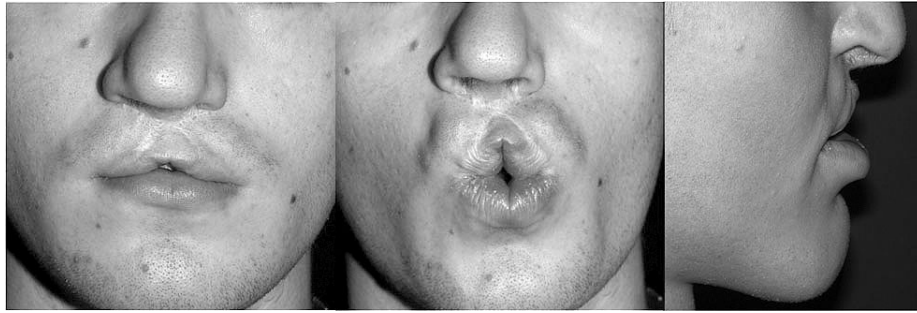


Fig. 1: Classical stigmata of secondary Bilateral Cleft Lip (BCL). Frontal view shows: absence of the prolabium and typical “whistling deformity” in static position; and inadequate muscle synthesis in blowing position, respectively. Three-quarter and profile views highlight: a serious unbalance of the lips with upper vermillion deficiency and procumbent lower lip; and a compromised profile like if the patient had maxillary hypoplasia, but really the upper lip is amputee and only a small percentage of these patients have maxillary hypoplasia.

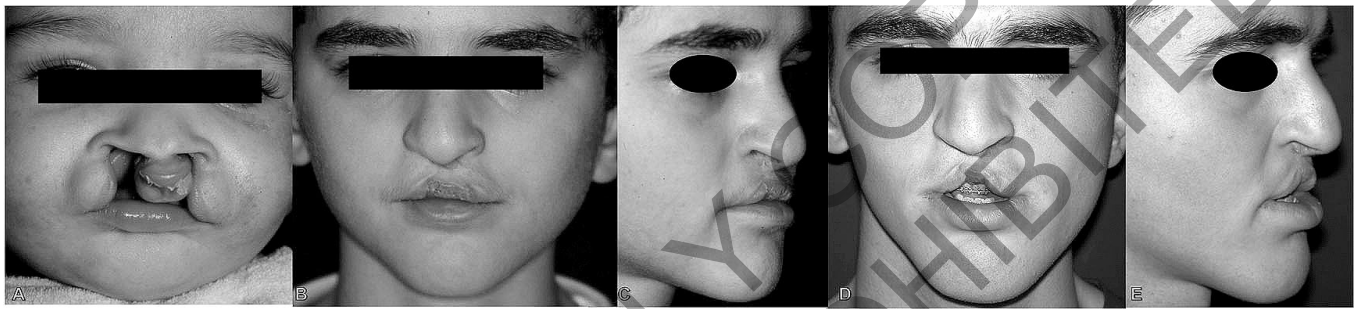
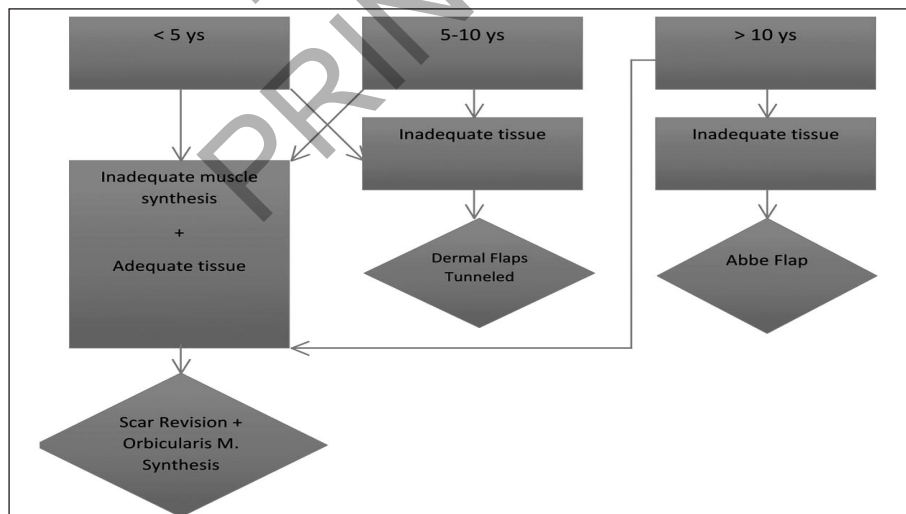


Fig. 2: Worsening of the BCL deformity with growth. The sequence of the images of the same patient shows a good reconstruction until to the childhood with adequate tissue presence, and the progressive worsening with an insufficient tissue development as he grows old.

TABLE I - Clinical data

Group	Surgery			Follow-up		
	Simple Scar Revision + Orbicularis Muscle Synthesis	Dermal Flaps Tunneled	Abbe Flap	5-7 ys	8-10 ys	10-12 ys
< 5 ys	59	22	–			X
5-10 ys	23	55	–		X	
> 10 ys	28	–	164	X		
Tot	110	77	164			



Flow-Chart

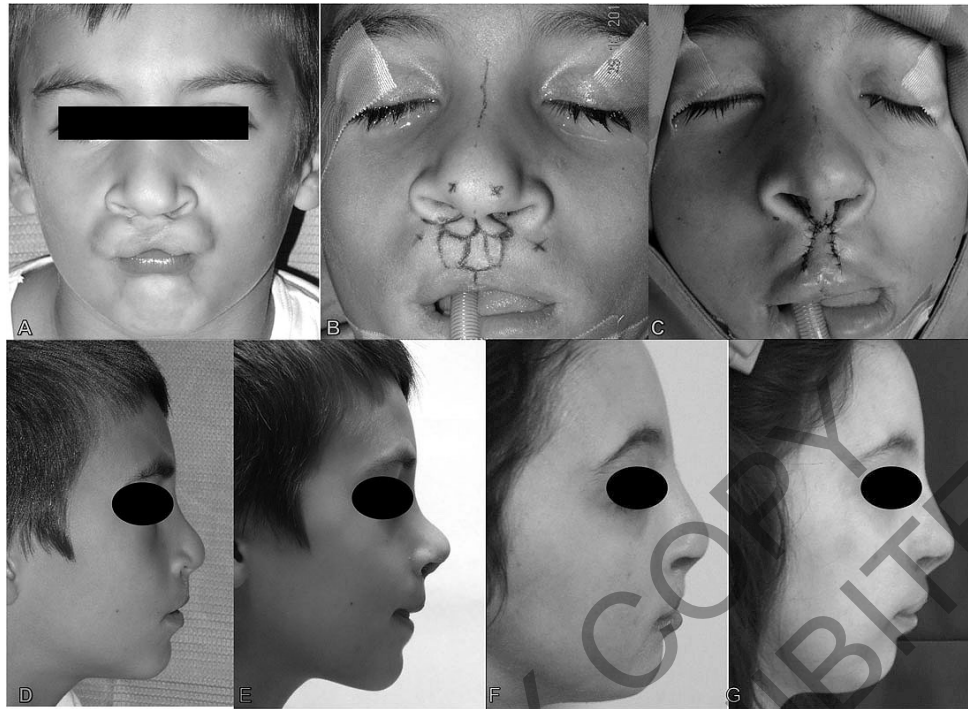


Fig. 3: Simple scar revision with orbicularis muscle synthesis. The picture more frequent in patients < 5 years is inadequate muscle synthesis with adequate tissue (which decreases with the growth). Overall, the frontal view in static position does not show evident defects (B). The anomaly is evident in the blowing position (A) and the profile (D and F). Particularly, in female children a thin upper lip determines an evident deformed profile (F). In these cases, dermal flaps (G) are associated to the muscle synthesis and to the reconstruction of a proper philtrum (C and E).



Fig. 4: Dermal flaps tunneled in the central vermillion. The revision of the scars permits the de-epithelization of two dermal flaps, which are tunneled into the central vermillion to have a durable filler effect.



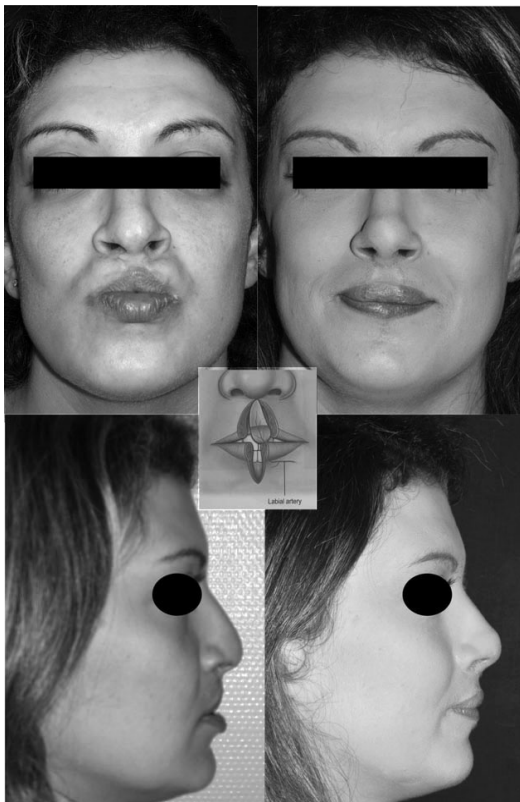


Fig. 5: Abbe flap. The flap is incised full thickness with care at the vermillion of the central lower lip to leave it pedicled on a small amount of mucosa and the labial artery. The flap is rotated and inset, taking care to align anatomic landmarks including closure of the orbicularis oris and matching of the white roll. Careful eversion of sutured edges prevents "notching" and minimizes scarring. A meticulous 3-layer closure at both the donor and recipient sites is standard. Two stages are required. After 2 to 3 weeks, the pedicle is divided and the flap inset, with excellent reconstruction of the upper lip.

TABLE II - *Cosmetic appearance evaluation*

Scale	Subjectively / Parent Group			Surgeon Group			Blinded third party observer Group		
	< 5 ys	5-10 ys	> 10 ys	< 5 ys	5-10 ys	> 10 ys	< 5 ys	5-10 ys	> 10 ys
1- very good	46	30	43	43	32	78	41	29	77
2- good	31	28	101	40	37	97	48	42	100
3- satisfactory	14	20	38	8	9	6	2	7	5
4- unsatisfactory	0	0	0	0	1	0	0	1	0
Tot	91	78	182	91	78	181	91	78	182

In the simple scar revision, we include the Millard forked flap<sup>1,2</sup> and modifications or Cronin advancement flaps<sup>3</sup> and modifications for columella lengthening, when necessary. These are very useful methods because scar revision of the upper lip and improvement of the tip projection can be performed at the same time.

Moreover, patients with 16-18 years old affected by the maxillary hypoplasia/retrusion, underwent LeFort I osteotomy (about 30% of the patients), and rhinoplasty if necessary also (>50% of the patients).

Our algorithm was performed in a total of 351 patients with bilateral cleft lip deformity in 30 years experience, (Table I) comprising males and females who were between 2.5 and 18 years old. Our pediatric center permits to follow patients until 18 years. We performed the analysis of early and late complications.

The evaluation of the results of the cosmetic appearance was evaluated: subjectively by a parent or patient himself/herself; and objectively by the surgeon and by a blinded third party observer (on the basis of the photographic evaluation).

## Results

The retrospective study of the cases showed that the protocol offers many advantages and few complications.

The simpler procedures consented adequate correction of most CLP stigmata in both morphologic and psycho-social analysis. Most of our cases have been treated with an Abbe flap which consented correction of nose tip projection, reconstruction of a proper philtrum and espe-



Fig. 6: Pre- and postoperative of Abbe flap to show the recovery of the harmonization of lip volumes.



Fig. 7: The solution of the Case on the figure 2: A and B) Preoperative: significant deficiency of the upper lip that appears amputee in profile view; C and D) Postoperative: Lip adhesion because of the Abbe flap rotated; E and F) Postoperative: Recovery of the upper lip tissue and projection; G, H, I and L) Pre- and postoperative Le Fort I osteotomy for maxillary advancement: Definitive recovery of a normal aspect.

cially in cases of tight upper lip harmonization of lip volumes (Figs. 6, 7).

At short-term follow-up, viability of the flaps, function and morphology are good, without significant complications. The complication recorded were edema and congestion, which resolved spontaneously.

At long-term follow-up, we evaluated the results both functional and aesthetics of the surgical procedures, and late complication. We observed significant improvement of the characteristics and profile of the patient's face and a normal function of the lips. Evaluating the late complications, we recorded a good state of formed scars.

The cosmetic assessment, by using parents/patients subjective evaluation, surgeon and blinded observer, was performed on a scale of 1 to 4 (1 score, the cosmetic appearance is very good; 4 scores, unsatisfactory cosmetic appearance) (patients as satisfactory (20.5%).

The answers of the surgeon were 43.6% very good; 49.8% good; 6.5% satisfactory; and 0.2% unsatisfactory results.

The blinded third party observer evaluated 41.8% as very good; 54.1% as good; 3.9% as satisfactory; and 0.2% as unsatisfactory results, on the basis of the photographic study.

## Discussion

Results of bilateral cleft lip repair are often poor because of inappropriate use of the hypoplastic prolabial tissue, failure to anatomically reunite the orbicularis muscle, and scarring. Deformities as irregular lip scars or lack of Cupid's bow definition and inadequate nose tip projection are unfortunately very common.

To eliminate the secondary surgery in the facial cleft is not possible, but it can be limited if the primary surgery is effective.

Various authors described different techniques for secondary cleft lip correction. Some authors described a different orbicularis muscle synthesis in patients from 17 to 40 years.<sup>4</sup> Some suggested a modification of the Spina Technique called "X Flap Procedure" in an attempt to correct the whistling deformity.<sup>5</sup> Some authors described a technique in which scar pedicled flaps were used, after deepithelialization, to improve volume, symmetry, and overall lip appearance.<sup>6</sup> A technique, that concerns secondary bilateral cleft lips and severe columella deformities, consists of a group of flaps named "Domino sliding flaps" in which flaps included 1 reverse "M"-shaped Abbe flap from lower lip, a diamond shape sliding flap, and 1 double fork flap from upper lip and malformed columella.<sup>7</sup> A classification system for residual or secondary nasolabial cleft deformities, based on the extent of tissue involvement in the residual deformity, is described, suggesting a surgical procedure for each type.<sup>8</sup> About the secondary correction, we believe that deformities should be corrected even in younger patients using simpler procedures,<sup>9</sup> and in teenager by using of the Abbe flaps<sup>10</sup>. This last obtains the best results for the upper lip, as well as the correction of lower lip protrusion remains a secondary benefit. For more than 100 years, it has remained a versatile technique for upper and lower lip reconstruction<sup>10,11</sup>, providing good functional and aesthetic results<sup>12</sup>. A solid understanding of cutaneous anatomy is important in flap design and elevation<sup>13</sup>. The main disadvantages are the need of two surgical times for pedicle division, and the intervening period of lip adhesion<sup>14</sup> that determine microstomia and difficulty eating; so, we not use it in children.

## References

1. Millard DR: *Columella lengthening by a forked flap*. Plast Reconstr Surg, 1958; 22: 454.
2. Millard DR, Cassisi A, Wheeler JJ: *Designs for correction and camouflage of bilateral clefts of the lip and palate*. Plast Reconstr Surg 2000; 105: 1609-623.
3. Cronin TD: *Lengthening columella by the use of skin from the nasal floor and alae*. Plast Reconstr Surg, 1958; 21: 417.
4. Cho BC: *Formation of the philtral column using vertical interdigitation of orbicularis oris muscle flaps in the secondary cleft lip*. Plast Reconstr Surg, 2006; 117(6):1992-2000.
5. Assunção AG, Ferreira LM, Mondelli RL: *Bilateral cleft lip and whistling deformity: The X flap procedure for its correction*. Plast Reconstr Surg, 2006; 117(6):1986-991.
6. Nadjmi N, Amadori S, Van de Casteele E: *Secondary Cleft Lip Reconstruction and the Use of Pedicled, Deepithelialized Scar Tissue*. Plast Reconstr Surg Glob Open, 2016; 4(10):e1061.
7. Wei J, Chiang CA, Zhou D, Li Q, Liu K: *Domino flaps for repairing of secondary bilateral cleft lip with severe columella deformity*. J Craniofac Surg, 2017; 28(1):17-20.
8. Sittah GA, Ghanem OA, Hamdan U, Ramia P, Zgheib E: *Secondary cleft nasolabial deformities: a new classification system for evaluation and surgical revision*. Cleft Palate Craniofac J, 2017.
9. Yin NB, Gao F, Wang YQ, Song T, Li HD: *Correction of secondary bilateral complete cleft lip and whistling deformities: the advance and rearrangement of the bilateral lip tissues*. Aesthetic Plast Surg, 2011; 35(5):750-55.
10. Sabbatini, P: *Cenno storico dell'origine e progresso della rinoplastica e cheiloplastica seguito dalla descrizione di queste operazioni sopra un solo individuo*. Bologna: Bell'Arti, 1838.
11. Abbe R: *A new plastic operation for the relief of deformity due to double harelip* (reprint from: Medical Record 1898;53:477). Plast Reconstr Surg, 1968; 42:481-83.
12. Nyame TT, Pathak A, Talbot SG: *The Abbe flap for upper lip reconstruction*. Eplasty, 2014; 14:ic30.
13. Gillies HD, Millard DR: *The principles and art of plastic surgery*. Boston, MA: Little, Brown; 1957.
14. Baumann D, Robb G: *Lip Reconstruction*. Semin Plast Surg, 2008; 22(4): 269-80.