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Evolution of my philosophy in the treatment of unilateral cleft lip and palate

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ABSTRACT

At the end of 50-year-long clinical activity, the evolution of my approach to the treatment of unilateral cleft of the lip and palate is discussed. I had several teachers in this field (Rusconi, Reherman, Perko, Delaire, Talmant, Sommerlad and others) and I introduced in my approach what I considered to be improvements from all of them.

My current protocol is related to the anatomy of the cleft: for wide clefts a two-stage protocol is applied (1° step: soft palate and lip and nose repair; 2° step: hard palate repair with gingivoalveoloplasty); for narrow cleft (less than 1 cm at the posterior border of hard palate) an "all in one" protocol is performed with or without gingivoalveoloplasty (in accordance to the presence or absence of contact between the stumps at alveolar level).

The most important details regarding surgery of the lip and palate are discussed.

Robust data collection on speech and skeletal growth is still needed to determine whether the "all in one" approach can be validated as the treatment of choice for unilateral complete lip and palate cleft in selected cases.

After more than 40 years of cleft lip and palate (CLP) treatment, still surgically active but on the verge of retirement, I feel it may be of some interest to retrace my career and describe the evolution I followed in the treatment of this complex disease. I have accumulated, what I consider, a significant experience based on a minimum of 70–80 new CLP cases I have personally treated as Head of Department of Maxillofacial Surgery at San Paolo University Hospital in Milan, the number of procedures I currently perform at the Smile House (regional Centre for cleft lip and palate) in Milan, the number of cases I treated once a month at the Paediatric Hospitals Buzzi in Milan and Meyer in Florence as well as those operated in several missions with Operation Smile around the world and in Tunisia, Belarus and Kosovo as senior lecture/consultant.

I began my maxillofacial surgical career in the nineteen-seventies at the University Hospital in Parma, under the guidance of Prof Rusconi. After a residency in Plastic Surgery with Prof Sanvenero Rosselli, a 12-month fellowship in Dusseldorf with Prof Rehermann and 6-months in Zurich with Prof Obwegeser and Perko I applied a protocol for complete unilateral CLP, which consisted of:

- at birth, application of orthopaedic plate according to Hotzt and Gnoinski (1976)
- at 6 months, soft palate repair with posterior pillars synthesis (Sanvenero Rosselli, 1973) and lip repair according to Randall (1959) leaving the hard palate open according to the philosophy of Schweckendiek (1955)
- at 6 years, hard palate repair with bipedicled mucoperiosteal flaps (Langenbeck, 1862)
- at 11 years, alveolar bone graft (Boyne and Sands, 1972)
- at 16–18 years, septorhinoplasty and maxillary osteotomy as required

This approach, once widely followed in Europe, had the aim to benefit speech development with early repair of the soft palate (previously treated separately from the lip at 18–24 months) and to respect the maxillary growth as much as possible: it is documented that early repair of hard palate with the rotation of mucoperiosteal flaps and healing by secondary intention of the exposed bone can lead to reduced maxillary growth in the three dimensions (sagittal, transverse and vertical) (Kremenak et al., 1970).

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In 1987, following an internship of a few months in Nantes at the clinic directed by Prof Delaire and the clinic of Dr Talmant, seduced by Delaire's philosophy and by some technical details by Talmant, I decided to modify my philosophy aiming to improve morpho-functional outcomes and to reduce the number of procedures.

This philosophy, which I have described in the chapter "Primary repair of the lip and palate using the Delaire philosophy" of the text book edited by Ward-Booth in 1999, has been the basis of my clinical activity and remained practically unchanged until 2006.

Differing from Delaire, at birth, in around 60% of cases (according to the cleft width) we applied the Hotz passive orthopaedic plate to reduce the separation of the stumps. Meticulous studies (Bongaarts et al 2009; Prahl et al 2006, 2008) have now documented that such orthopaedic treatment does not produce better surgical results, weight gain, maxillary growth or improved speech. The plate does, however, result in a psychologically beneficial link between the family and the treating medical team that can be of crucial importance. Aware of its limits we still use the orthopaedic plate and taping selected wide cleft cases to reduce the need of large subperiosteal dissection at lip surgery.

With regard to nasal moulding (Cutting et al., 1998), we have considerable experience in bilateral forms (Meazzini et al., 2010a,b), but we do not think it is routinely necessary in the unilateral ones.

1. 1° Surgical step (4–6 months)

1.1. Soft palate repair

The repair of the soft palate begins with an incision along the margin of the cleft bilaterally and posteriorly to the limit of the hemiuvulae followed by the dissection of oral and glandular mucous layer from the nasal and muscular layer. This separation is facilitated by blunt dissection with a Freer elevator beginning at the horizontal process of the palatine bone. It is critical that the dissection at this level is performed rigorously, subperiosteally and on the plane of palatal aponeurosis and of the tendon of the tensor palati muscle. Proceeding posteriorly within this plane, the separation of the mucous and glandular layer from the muscular layer can be achieved easily. The nasal mucosa is now lifted from the palatal bone posterior border in a subperiosteal plane.

To facilitate the tension free suturing of nasal and muscular layers, up to 2003, we used to perform a closed fracture of the pterygoid hooks in the majority of our cases (Billroth, 1889) positioning a Trellat's curved elevator anterior to the hook's base and pushing it backward.

Since 2004, instead of hooks' fracture, we have been performing the section of the tendon of the tensor palati muscle (Liston, 1846), easily identifiable via a medial approach once the oral plane has been accurately lifted, without the need for lateral releasing incisions (Fig. 1).

Once the muscle tendon is cut it is feasible to undermine the soft tissues from the internal lamina of the pterygoid process up to the skull base (Braithwaite, 1964) and to mobilize the whole myomucosal nasal layer toward the midline (Fig. 2).

The suturing of the nasal layer starts at the level of the posterior border of the hard palate and proceeds posteriorly to the tip of the hemiuvulae that, sutured together on both nasal and oral plane, will constitute the new reconstructed uvula.

To complete this stage of the procedure, it is then fundamental to suture the muscular layer. From 1976 to 2003, we used to perform the technique described by Pigott (1987) integrated by a limited intravelar veloplasty by the detachment of the anterior muscular insertions from the nasal mucoperiosteum according to Braithwaite (1964). In 2004 our technique for the muscle layer repair changed as we embraced the technique described by Sommerlad (2003): with the aid of a microscope, the muscle is completely dissected from the nasal layer, rotated posteriorly and the two stumps sutured in the midline.

In detail: once the suturing of the nasal plane as described above is complete, a gauze soaked in adrenaline is applied to the muscle layer for a few minutes while the theatre staff prepare the

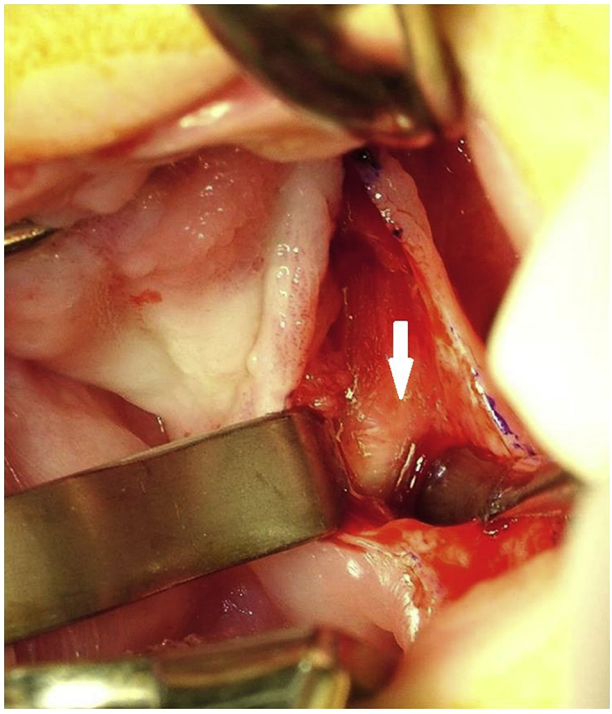

Fig. 1. Section of tensor palati tendon (arrow), medially to pterygoid hook, via marginal approach.

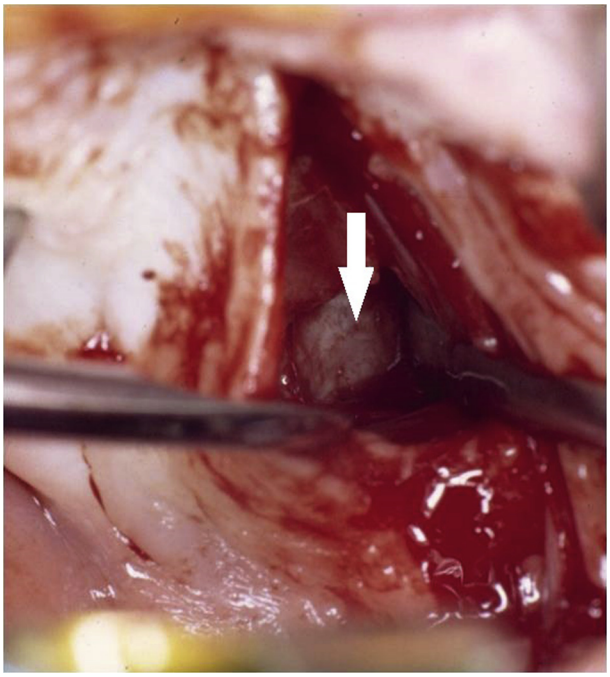

Fig. 2. In close contact with pterygoid plate (arrow) the subperiosteal dissection is extended to the cranial base and the soft tissues medially luxated.