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Surgical management of facial, craniofacial, and laterofacial clefts involving the lips, the jaws, and the palate

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Introduction

Craniofacial dysraphia, orbito-maxillary and lateral facial clefts are rare congenital malformations compared to the cleft lip and palate [1]. The occurrence of lateral facial clefts is reported in 0.7 up to 5.4 out of 1000 cases of cleft lip and palate [2]. The anatomical classification described by Tessier [3] is commonly used for further differentiation (Fig. 1). Among these 15 malformations, clefts no. 0, 1, 2, 3, 4, 5, and 7 are often associated with clefts of the lip, the alveolar process and the palate.

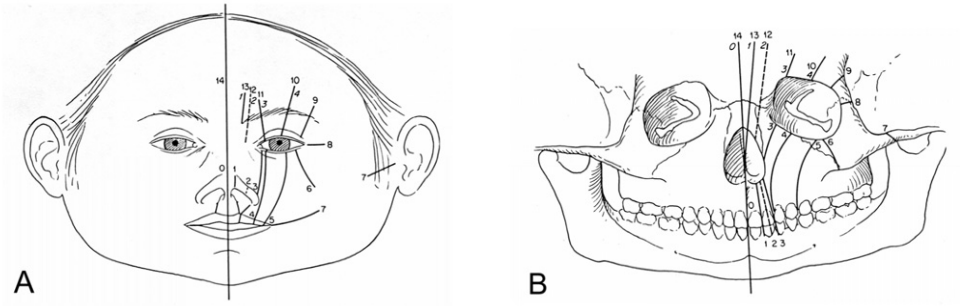

Fig. 1 Classification of facial and cranial clefts by Tessier: (A) Location in the soft tissues.
(B) Location in the skeleton.

The combination of a cleft lip and palate on the one hand and the gradual evidence of associated symptoms of the central and the lateral face on the other can be regarded as a severe dysmorphic disorder in terms of aesthetic as well as functional aspects. In these cases an extensive surgical management is required.

Patients and Methods

In our surgical center, a number of 11 patients with complex facial clefts were surgically treated between 01/1993 and 04/2001. The classification of these clefts followed the nomenclature of Tessier [3] and revealed the distribution listed in the table below. The differentiation of these clefts was based on clinical investigation, diagnostics using technical equipment and intraoperative findings.

Cleft type	0/14	1	2	3	4	5	7
n	3	1	1	2	1	2	1

Table: Patients with facial clefts treated between 01/1993 and 04/2001

Results

Each of the 11 patients with complex facial clefts was analyzed with regard to the different surgical procedures. Even though each of these cases poses a very individual surgical challenge, some general and special principles have to be regarded in the completion of the complex treatment modalities (Fig. 2-5).

General surgical principles

1. The aesthetic and functional correction of facial clefts poses a special surgical challenge. The extent of the defects involving the soft tissues and the bony structures is often underestimated.
2. The basic condition for the normalization of the facial growth is an extensive mobilisation with consecutive anatomical reconstruction of the perioral, perinasal, and infraorbital facial muscles.
3. Surgical reconstruction should include corrections involving the skin, the mucosa, and the bony structures in a single surgical key procedure, because the extent of the soft tissue defects and the underlying skeletal abnormalities are closely associated with each other.

Special surgical principles

Clefts of the bone:

- Initially the cleft is left open to avoid tractive forces on the adapted, covering soft tissues.
- Augmentation of bone in defects involving the orbital floor (if necessary)
- Correction of ocular hypertelorism (if necessary)

Clefts of the soft tissues:

- Extended subperiosteal preparation of the facial soft tissues reaching to the associated bone sutures.
- Muscular reconstruction of the perioral, perinasal, and the infraorbital muscles according to the principles of Delaire [4].
- Step-by-step-reconstruction of the soft tissue defects realigning the medial canthus, the base of the nasal wings and the orbicularis oculi muscle; if necessary, reconstruction of the lower eyelid using a local flap from the upper eyelid or from the supraorbital region; in large defects a median frontal flap may be necessary.
- Compensation of buccal soft tissue defects with an extended mobilisation of the buccal soft tissues and consecutive rotation or advancement to the medial side.
- Closure of the palatal cleft and the cleft of the jaws in a second or third surgical procedure.
- At a later date further corrections to optimize aesthetic and functional outcome may be required for the individual patient.

Casuistics

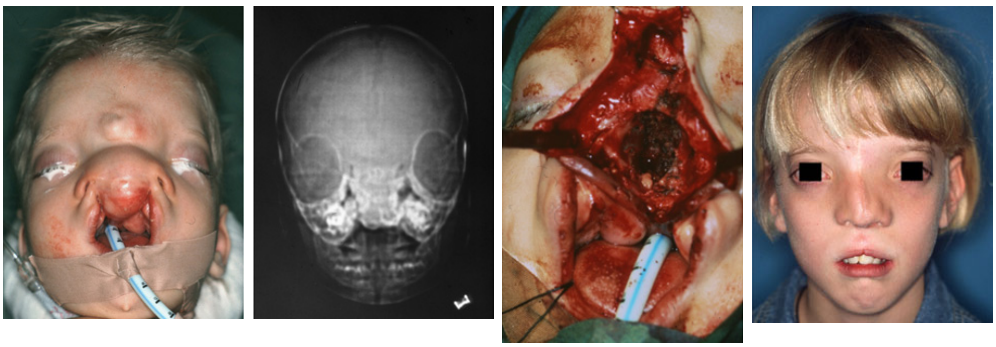

Fig. 2 Cleft no. 0 and 14 (Tessier)

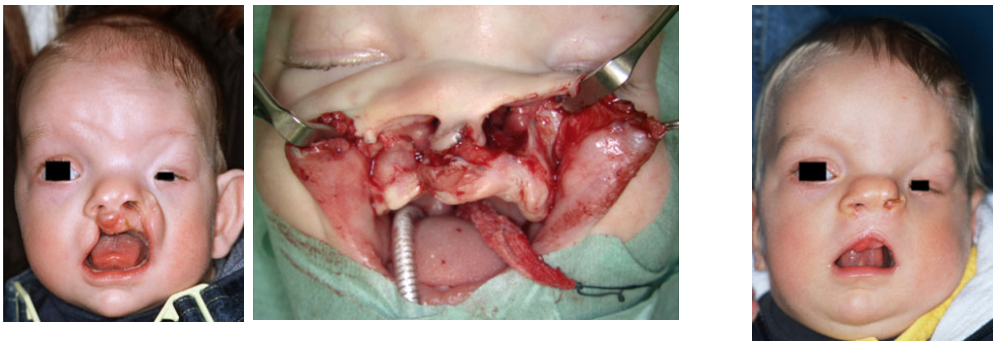

Fig. 3 Cleft no. 3 (Tessier)

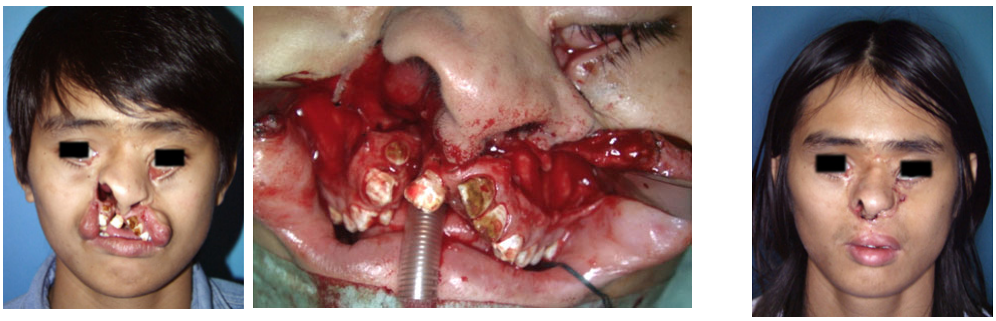

Fig. 4 Right facial side: cleft no. 3; left facial side: Cleft no. 4 (Tessier)

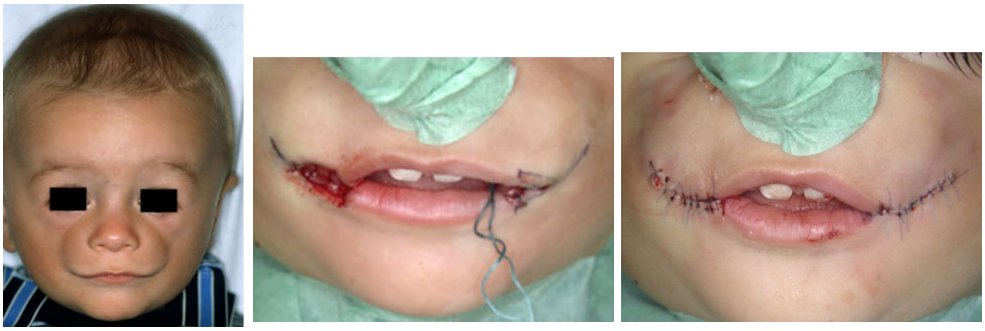

Fig. 5 Cleft no. 7 (Tessier)

Conclusion

The treatment of complex facial clefts requires thorough individual planning based upon different principles of cleft surgery. This will lead to a normalization of the facial growth and a satisfactory functional and aesthetic outcome.

Literature

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