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Distraction of the hard palate for treating velopharyngeal incompetence. A case report.

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Introduction

Many procedures have been described to treat velopharyngeal incompetence [4,6-9,11, 14-22]. Up to now, each surgical method is associated with its own specific problems and risks [5,10,12,13]. Clinical outcome is often unsatisfactory depending on the genesis and extent of the anomaly. A new treatment concept for velopharyngeal incompetence was introduced by Carls et al in 1997 [2,3], performing distraction osteogenesis of the hard palate in an experimental study in dogs. Ascherman et al. [1] confirmed this concept in a canine cleft palate model. The presented case shows a clinical application of this new procedure for treating velopharyngeal incompetence in a cleft palate patient.

Case report and Methods

A 7-year-old male with a surgically closed cleft palate, presented with an extensive velopharyngeal incompetence, severe nasalized speech and rhinoponia aperta. The initial very large, isolated, cleft palate was closed at the age of 18 months through a bilateral pedicle palatal flap. Clinical examination by nasopharyngeal endoscopy showed a 10-12 mm distance between the velum and the posterior pharyngeal wall, which could not be substantially reduced even by provoking a glossary reflex, despite good muscular function. Firstly, a custom-made, individually fabricated, orthodontic-like distraction device was made (fig.1). An expansion screw was inserted which allowed antero-posterior lengthening. The distraction device was stabilized to the teeth through wire ligatures.

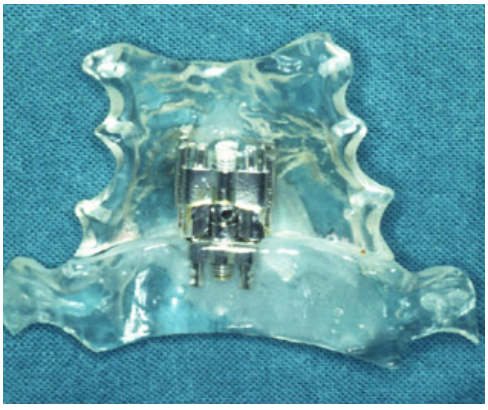

Fig. 1: Distraction Device.

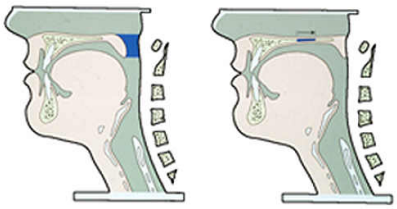

Fig. 2: Principle of hard palte distraction for treating velopharyngeal incompetence.

Under general anaesthesia with endotracheal intubation and after local infiltration of the palatal mucosa with a, vasoconstrictant agent, a bilateral posteriorly based mucoperiosteal palatal flap was elevated (fig.3). An osteotomy was made across the hard palate at the level of the transverse palatine suture using a narrow Lindemann burr (fig.4). The pterygoid process, was separated from the maxillary tuberosity while the greater, palatine foramen was detoured laterally with careful handling of the neurovascular bundle. The separation of the medial and lateral laminae of the pterygoid process from the cranial base was performed using a curved osteotome.

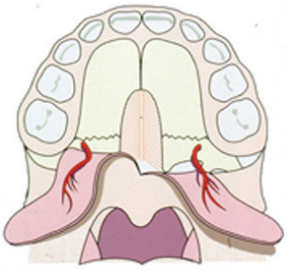

Fig. 3

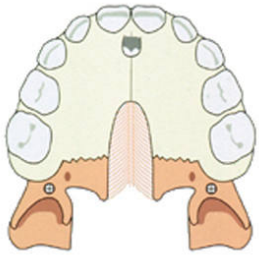

Fig. 4

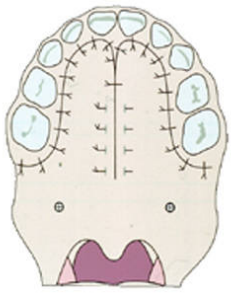

Fig. 5

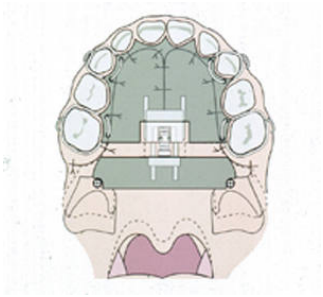

Fig. 6

Fig. 3-6: Scheme of operative procedure.

Operative access to the hard palate by formation of a bilateral pedicle flap (Fig.3). Osteotomy fthe level of transverse palatine suture and separation of the pterygoid process. Transmucusal fixation of screws bilaterally at the bridge between the lateral and medial laminae of the pterygoid process (Fig.4). Adaptation of the wound edges (Fig.5). Distraction device ligatured to the teeth. Screw heads polymerized at the dorsal edge of the device. Confirmed activation of the expansion srew at the end of operation (Fig.6).

The careful handling of the descending palatine arteries running in the pterygopalatine canal was always considered to be of primary importance. After complete mobilization of the osteotomized complex, a 16 mm long screw was introduced bilaterally at the bridge between the lateral and medial laminae of the pterygoid process. Both of the mucoperiosteal palatal flaps were now replaced and the head of the screws were lead through the mucosa by a retrotubar incision. After adaptation of the wound edges, the distraction device could be fitted and ligatured to the teeth. The screw heads were polymerised at Ihe dorsal edge of the distraction device. At the end of the operation, activation of the distraction device was tested.

Results

Both the surgical intervention and postoperative period were uneventfull. Oral feeding was possible on the first postoperative day. The distraction device was well tolerated. No signs of mucosal irritation were found after removal of the distraction device. Mobility of the osteotomized segments did not appear. Four weeks after removal of the device, a 3-4 mm distance between the velum and the posterior pharyngeal wall was measured. Hence, a 7-8 dorsal displacement of the soft palate was registered (fig.9). The mobility of the soft palate was completely retained and characterized by a circular closure pattern. Rhinolalla aperta was still evident, although it was substantially reduced, compared to the preoperative findings. Speech comprehensibility, especially of plosive sounds, was clearly improved.

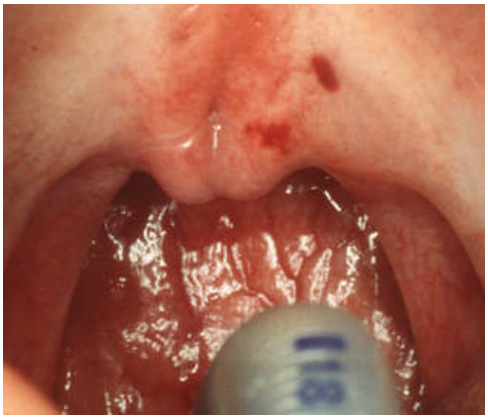

Fig. 7: Velopharyngeal incompetence before treatment.

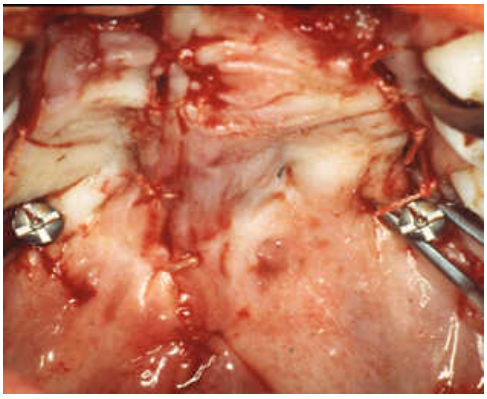

Fig. 8: After attachment of the wound edges.

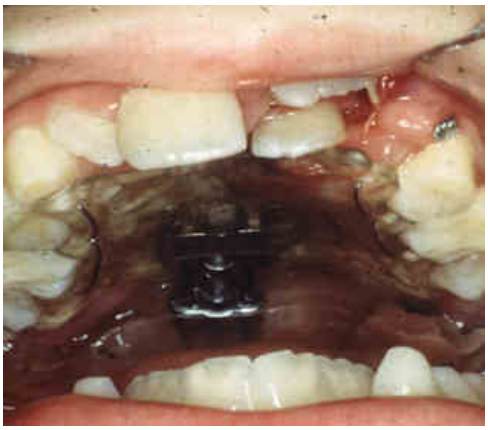

Fig. 9: Distraction device in situ.

Fig. 10: At the end of treatment.

Conclusions

Our initial experience with distraction osteogenesis of the hard palate for treating velopharyngeal incompetence in a cleft palate patient was satisfactory. Lengthening of the hard palate by distraction osteogenesis may provide an alternative technique to correct velopharyngeal incompetence. However, in the future, more clinical studies are necessary to evaluate long-term treatment outcome of this procedure.

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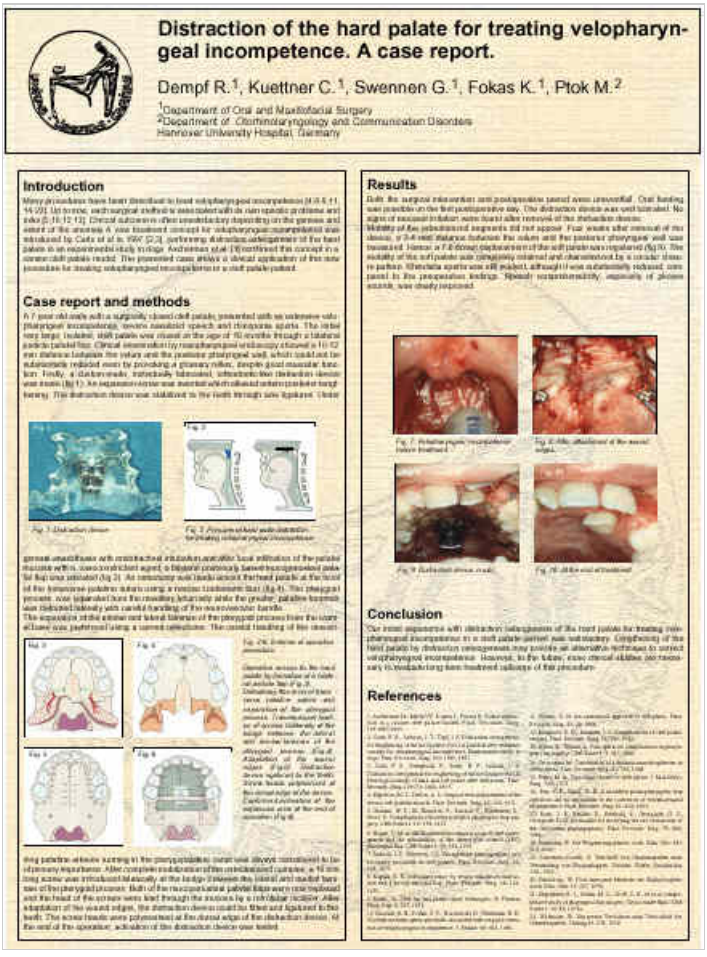

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Introduction

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References