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Lateral transmandibular approach to the skull base in children - A report of three cases

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Introduction

High demands have to be placed on surgical approaches for tumors of the cranial base, particularly with regard to pediatric operations. A good surgical view, a minimum possible impairment of facial skull growth, the prevention of tooth and dental pulp injuries and the preservation of motor and sensory nerve integrity should mainly be considered. From 1993 until 1996 three children aged between 8 months and 6 years with tumors of the cranial base underwent surgery in our clinic through a lateral transmandibular approach. The follow-up of two of those children could be observed right up until now.

Surgical Technique

In all these patients preauricular incision with temporal and submandibular extention was performed (Fig. 1). After identification of glossopharyngeal nerve, vagus nerve, accessorius and hypoglossus nerve the internal carotis artery was followed up to the cranial base. The trunk of the facial nerve was prepared in the parotid gland up to the peripheral branch. From the preauricular incision the zygomatic arch was osteotomized temporarily, pedicled at the masseter muscle and placed caudally. The mandibula was prepared cranially on the lateral surface of the ascending ramus and could then be osteotomized above the mandibular foramen. The cranial segment was exarticulated at the skull base, leaving the discus articularis, pedicled at the termporal muscle and displaced cranially (Fig. 2-7). Now a wide access to the cranial base was provided and the tumors could be resected. The refixation of the ascending mandibular ramus as well as of the zygomatic arch was carried out according to the children's age using 2.0 mm mini- or microosteosynthetic plates.

Fig. 1: Preauricular incision with temporal and mandibular extension.

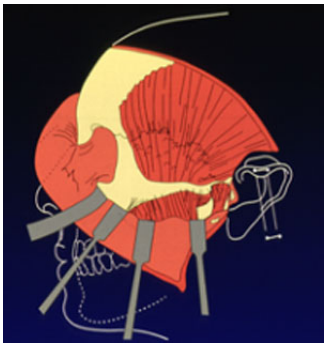
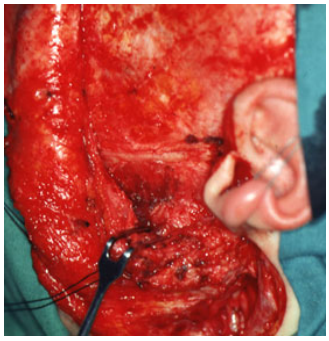

Fig. 2 and 3: After incision preauricular pretaration of the zygomatic arch

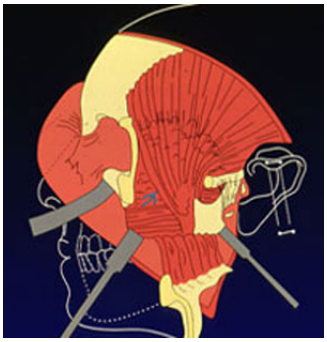
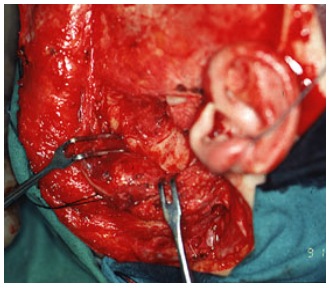

Fig. 4 and 5: Zygomatic arch was osteotomized temporarily, pedicled at the masseter muscle and placed caudally.


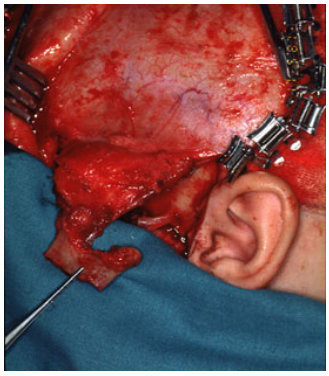

Fig. 6 and 7: The mandibula was prepared cranially on the lateral surface of the ascending ramus. After osteotomy of the mandibule above the foramen, the cranial segment was exarticulated at the skull base.

Cases

The lateral transmandibular approach was performed in two children (Case 1 and 2) with a intracranial extended sarcoma and in another infant with a teratoma of the skull base (Case 3). In all cases the access to the tumors was sufficient for resection. The postoperative wound healing process was uneventful in all patients, the opening of the mouth was not impaired. The first patient (Case 1) died 7 months postoperatively of cerebral metastases. The other two children, by then 9 and 7 years old, have been free of recidives until now. However, a hypoplasia of the part of the face involved as well as a growth deficit in the ascending mandibular ramus, leading to an inclined occlusal plane, could be detected as the results of the treatment. In the now 7-year-old child (Case 3) was successfully treated with an external osteodistraction device because of mandibular retrognathie.

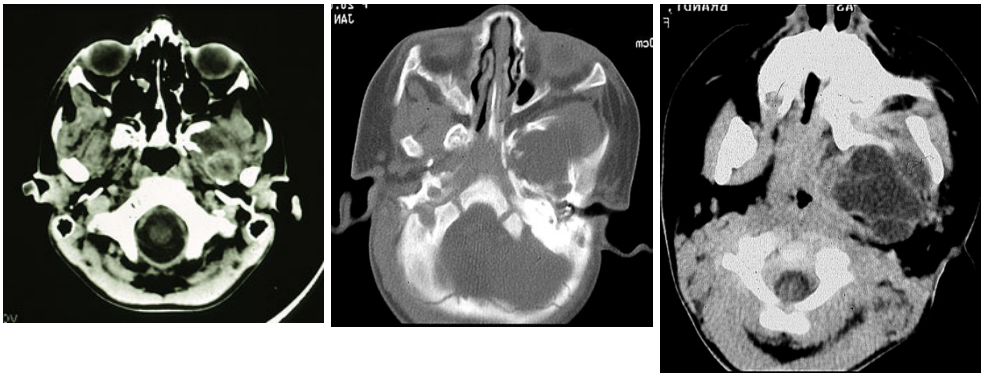

Fig. 8-10: Preoperative CTs of case 1 (Fig. 8) and case 2 (Fig. 9) presenting a sarcoma. Case 3 (Fig. 10) had a teratoma of the skull base.

Fig. 11-15: A little girl, who underwent surgery because of a sarcoma, after resection of a sarcoma via transmandibular approach and during follow-up. Due to restricted opening of the mouth two years postoperatively, an ablation of the coronoid process had to be performed in the 9-year-old child. Today, this child has a normal range of opening the mouth as iwell as a normal dentition. The initial retrusion of the entire mandibula could be corrected favourably.

Conclusion

Considering the severe diagnosis, the patients showed good results with acceptable deficits. As far as the tumor surgery is concerned, this approach has proved to be successful according to our experience and met all the requirements extensively. Growth impairment of the mandible can be corrected successfully by distraction osteogenesis technique.

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This poster was submitted by Dr. Christian Küttner.

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Poster Faksimile:

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