



Temporalis Muscle Rotation to Reconstruct the Palatal Defect Following Maxillectomy in a Three Months Old Infant

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Abstract

Background: Rehabilitation following maxillectomy has been a challenging aspect of surgical management of sinonasal pathology. In here, we are reporting a novel technique of successful rehabilitation of maxillectomy defect in a three months old infant in which neither obturator nor could free flap have been useful for closure of the palatal defect.

Case Report: Three months old male infant with Melanotic Neuroectodermal tumor of infancy of maxilla underwent maxillectomy with excision of tumor and the resultant palatal defect was closed primarily by rotation of mobilised temporalis muscle flap. Infant had uneventful and early functional recovery with resumption of oral feeds on day four.

Conclusion: Temporalis muscle flap is a novel and promising technique for reconstruction after maxillectomy, with advantages of early oral feeding. In addition, it may reduce the risk of recurrence by enabling radical excision, which otherwise would not have been possible without reliable rehabilitation.

Introduction

Rehabilitation following maxillectomy is intriguing. The altered anatomy and physiology following maxillectomy is likely to shackle the overall quality of life by vexing the swallowing and speech of the individual, if not appropriately rehabilitated. Though the present consensus is divided onto what remains ideal rehabilitative option following maxillectomy, the trend is slowly shifting from contemporary prosthetic obturators towards much promising free flaps. In this case report we present a unique scenario of successful rehabilitation of palatal defect following maxillectomy in a three months old infant, in which, neither obturator nor free flap could have been useful for closure of the palatal defect. Reconstruction of palate with temporalis muscle rotation flap has earlier been vastly described in adults, nevertheless, to our knowledge such a reconstruction in such young infant has not been done or reported in literature. Discussion also includes relevant literature review and detailed account into the need for such a reconstruction.

Case Presentation

Three months old male infant was referred to our centre with a progressive swelling in the right cheek since birth. On examination, the infant had an ill-defined swelling in right canine fossa of size 3x3 cms, which was hard in consistency, with normal overlying skin and had extended into the right side of hard palate as mucosa covered bulge. Rest of head and neck examination was normal. Contrast enhanced computer tomographic scan showed heterogeneous enhancing solid tumor arising from anterior-lateral wall of maxilla, with dense calcification, destruction and scalloping of bone as in Figure 1. It was diagnosed as Melanotic Neuroectodermal tumor of infancy (MNTI), based on histological and immunohistochemical characteristics of the biopsy specimen. Patient underwent surgical resection under general anaesthesia. Taking adequate margins all around, total maxillectomy was performed with appropriate bony cuts to remove whole of the tumor, as in Figure 2. The resultant palatal defect was primarily reconstructed by temporalis muscle rotation flap. By a separate incision temporalis muscle flap was raised, rotated and tunnelled through the subcutaneous flap in order to cover the maxillectomy defect as depicted in Figure 3. Infant had an uneventful postoperative recovery with well healing of the wound as shown in Figure 4. 'Oral sips on demand' were resumed as early as day four following surgery. Feeding nasogastric tube was removed on postoperative day seven. The infant was able to maintain hydration and nutrition on oral feeds

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Received Date: 31 Dec 2016

Accepted Date: 25 Jan 2017

Published Date: 27 Jan 2017

Citation:

Devaraja K, Sikka K, Thakar A,
Seth R. Temporalis Muscle Rotation
to Reconstruct the Palatal Defect
Following Maxillectomy in a Three
Months Old Infant. *Ann Clin Case Rep.*
2017; 2: 1248.

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Fig 1. Contrast enhanced Computer tomography

Figure 1: Contrast enhanced Computer tomography.



Figure 2: Gross excision specimen.

without any nasal regurgitation or suckling issues. Histopathology examination of surgical specimen showed negative margins.

Discussion

“MNTI is a rare, benign but locally aggressive tumor including gradual invasion of surrounding structures [1]” and “it is said to have originated from neural crest [2]”. “Surgical excision is the treatment of choice and the role of chemotherapy is limited to some malignant and metastatic disease [3]”. Also, these tumors have considerable recurrence rate that varies between 10-60% and “15% of recurrence occurs within 4 weeks of surgery [2]”. There is a risk for malignant transformation of 6.6%. Nevertheless, most of the reports have mentioned either “sub-radical excision or curettage of these tumors in order to minimise morbidity [4,5]” arising out of surgical excision, which can be a principal reason for increased recurrence rates. The idea behind the such an approach is to prevent the grievous consequence of maxillectomy in an infant, which unrelentingly affects feeding, and indirectly strangles the infant’s nutrition, immunity as well as overall development. In general, infants are not ideal for palatal obturators nor are they considered for composite free flaps, the standard alternatives for reconstructing palatal defects in adults.

The essence of primary reconstruction of palatal defect lies in the fact that not only it spares the infant from morbidity of maxillectomy, but also snubs the recurrence rate by inculcating surgeon for

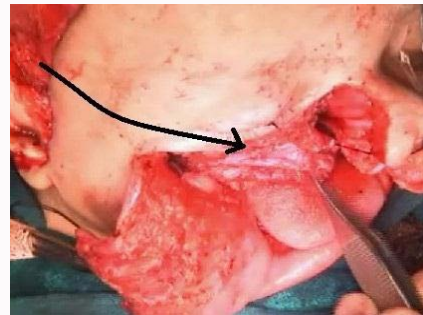


Figure 3: Intraoperative picture after excision of tumor, showing direction and arc of rotation of temporalis muscle to cover palatal defect.



Figure 4: Clinical picture on postoperative day seven showing well healed defect.

radical excision of primary tumor, instead of mere curettage. In the index case, planning of reconstruction with rotation flap was made preoperatively; enabling the complete excision of tumor with adequate margin by total maxillectomy and then, the resultant palatal defect was reconstructed by temporalis muscle rotation flap based on deep temporal artery. The current reconstruction option is much preferable to either an obturator or a free flap both of which would pose major difficulties in execution in an infant. With growth and dentition it would be possible for the child to masticate and chew from the contralateral side. Further, if future needs so demand, there are always the options of subsequent obturator or of flap with dental implants at a later date.

Primary reconstruction following surgical resection of tumor has itself been debatable. It is said that primary closure of the surgical defect can hamper an early detection of recurrence, but in a three month old, clinical examination even with nasal endoscopy has little bearing on decision making and “most of the surgeons or oncologists rely on radiological evidence” [6]. One might as well go on to argue that second stage reconstruction after histopathological confirmation of free margins and a disease free follow up of few weeks can be good alternative approach. Nevertheless, the present approach of primary reconstruction possibly avoids second general anaesthesia in an infant and can account for even those unfortunate ones, who might not follow up in later date. Moreover as mentioned earlier, reliable reconstruction ensures radical excision, minimising the possibility of margins involvement and/or recurrence.

Another argument can question the need for any surgical

reconstruction at all in these cases, considering the fact that the cleft palate cases are managed conservatively until certain age and most of these cases do well. Yet one must understand that the advocated delay in cleft palate repair is due to development and maturation issues of eustachian tube muscles, which is not the scenario in a maxillectomy infant. Also the pathophysiology in cleft palate is different from palatal defect following maxillectomy and even so in cleft palate cases, there is invariable need for surgical correction as earlier as the conditions deemed feasible.

Conclusion

In conclusion, for rehabilitating maxillectomy infants, primary reconstruction of palatal defect with temporalis muscle rotation flap is a good option for early oral feeding, with specific advantages.

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