

BACKGROUND

Oncoplastic reconstruction of the maxilla is highly challenging given the aesthetic and functional importance of the bone.

- Presently, there is a paucity of outcomes data for children and adolescents undergoing reconstruction of post-ablative defects of the maxilla that involve the palate.

Purpose: To assess the postoperative course of pediatric patients who underwent reconstruction of maxillary defects with palatal involvement at our institution. Additionally, we outline our multidisciplinary head & neck tumor team's approach to reconstructing these difficult defects.

METHODS

- A retrospective chart review of all patients who underwent oncoplastic reconstruction of the maxilla at our institution from March 2015 to January 2022 was performed. Patients with post-ablative defects sparing the palate were excluded.
- Variables analyzed included:**
 - patient demographics,
 - tumor characteristics,
 - instances of neoadjuvant or adjuvant chemotherapy or radiotherapy,
 - defect characteristics,
 - reconstructive modalities performed, and postoperative complications at the donor and recipient sites.

Table 1. Clinical Characteristics, Interventions, and Reconstructive Outcomes of Patients Undergoing Oncoplastic Reconstructions

| Patient Number | Age at First Surgery (Months) | Tumor Diagnosis | Chemotherapy | Radiotherapy | Structure(s) Involved [†] | Reconstructive Procedure(s) | Recipient Site Complications |
|----------------|-------------------------------|---|---|------------------------------|---|---|---|
| 1 | 102 | Medulloepithelioma | Neoadjuvant Cyclophosphamide, Cisplatin, Vincristine, Etoposide | Adjuvant Proton Radiotherapy | Complete Hemi-maxilla and Orbital Cone | ALT fasciocutaneous flap | Total flap necrosis requiring reconstruction with contralateral VL myocutaneous flap |
| 2 | 189 | Mesenchymal chondrosarcoma | Neoadjuvant Doxorubicin and Ifosfamide | Adjuvant Proton Radiotherapy | Complete Hemi-maxilla | Procedure #1: ALT fasciocutaneous flap Procedure #2: Osseous fibula flap without dental implants | Procedure #2: Complete necrosis of ALT fasciocutaneous and osseous fibula flaps requiring reconstruction with contralateral ALT fasciocutaneous flap |
| 3 | 6 | Neuroectodermal tumor of infancy | - | - | Complete Hemi-maxilla | Procedure #1: Buccal myomucosal flaps Procedure #2: ALT fasciocutaneous flap [‡] | Procedure #1: ONF development requiring revision of buccal myomucosal flaps Procedure #2: Postoperative flap swelling with compression of the globe requiring flap debulking |
| 4 | 17 | Desmoid fibromatosis | Neoadjuvant Doxorubicin | - | Complete Hemi-maxilla | ALT fasciocutaneous flap | - |
| 5 | 171 | Osteosarcoma | Neoadjuvant Methotrexate, Doxorubicin, Cisplatin; Adjuvant Ifosfamide | Adjuvant Proton Radiotherapy | Complete Hemi-maxilla | ALT fasciocutaneous flap | - |
| 6 | 75 | Odontogenic myxoma | - | - | Complete Hemi-maxilla | ALT fasciocutaneous flap | - |
| 7 | 182 | Odontogenic myxoma | - | - | Complete Hemi-maxilla | Procedure #1: VL myocutaneous flap Procedure #2: Osseous fibula flap without dental implants | - |
| 8 | 141 | Primitive myxoid mesenchymal tumor of infancy | Neoadjuvant Vincristine, Actinomycin D, and Cyclophosphamide | - | Hard palate (with Maxillary Arch involvement), Lateral Nasal Sidewall | VL myocutaneous flap | - |
| 9 | 128 | Mucoepidermoid carcinoma | - | - | Hard palate (with Maxillary Arch involvement) | ALT fasciocutaneous flap | ONF development secondary to partial necrosis of ALT flap requiring debridement and healing by secondary intention |
| 10 | 169 | Mucoepidermoid carcinoma | - | - | Hard palate (without Maxillary Arch involvement) | Locoregional reconstruction of palatal defect | - |

[†]All patients, except for patient 9, had unilateral palatal defects. [‡]For separation of oral, sinonasal, and orbital cavities following failed alloplastic reconstruction of the orbital floor. Abbreviations: ALT = anterolateral thigh; VL = Vastus lateralis; ONF = oronasal fistula.

RESULTS

A total of 10 patients with a mean age of 118.0 months and mean follow-up of 25.1 months.

- 2 with defects isolated to the hard palate
- 8 with defects involving the maxillary arch and dentition

Primary separation of the oral and sinonasal cavities was achieved using free tissue transfer (FTT) in 8 patients with the remainder undergoing reconstruction with buccal myomucosal flaps. Reconstruction of the maxillary arch using a free fibula flap was performed in 2 patients.

- Two microvascular reconstructions were complicated by total flap loss requiring repeat FTT to correct the defect, and 1 was complicated by the development of an oronasal fistula (ONF) secondary to partial flap necrosis, healed following debridement. One patient required emergent flap debulking due to compression of the globe secondary to postoperative flap swelling. One patient developed an ONF following locoregional reconstruction of the palate, repaired with flap revision.
- No complications at the donor site following surgery were observed; all patients achieved satisfactory swallow outcomes following surgery

CONCLUSION

Oncoplastic reconstruction of complex maxillary defects with palatal involvement is challenging; however, our clinical experience demonstrates that satisfactory reconstructive outcomes are attainable.

RECONSTRUCTIVE ALGORITHM

Fig 1 (below): Our center's approach to reconstructing post-ablative defects of the maxilla that involve the palate, based on clinical experience. We propose the following: Separation of the oral and sinonasal cavities is performed at the time of tumor resection. Small- and medium-sized palatal defects that do not involve the maxillary arch are reconstructed with buccal myomucosal flaps using standard palatoplasty techniques, whereas large defects require reconstruction with large myocutaneous (MCCF) or fasciocutaneous free flaps (FCFF). Bony reconstruction of the maxillary arch is either performed in single stage or multistage fashion based on the age of the patient at the time of tumor resection. At our institution, we reconstruct the upper jaw and dentition in patients once they are 13 years of age or older as growth of the maxilla is almost finished by this age.

