

BACKGROUND

Post-ablative defects of the mandible following resection of craniofacial tumors are challenging to reconstruct given the functional importance of the bone.

- Among reconstructive modalities, non-vascularized and vascularized fibula are frequently used when reconstructing small and large defects, respectively.
- There is a paucity of data detailing reconstructive and functional outcomes following oncoplastic mandibular reconstruction in the pediatric population because of the low incidence of craniofacial tumors in this patient demographic.

Purpose: To assess the efficacy of both reconstructive modalities for oncoplastic mandibular reconstruction in children and adolescents.

METHODS

- A retrospective chart review of all pediatric patients who underwent reconstruction of post-ablative defects of the mandible by our institution's multidisciplinary head & neck tumor team from March 2015 to January 2022 was performed.
- Defects were characterized based on the mandibular subunits that were involved with the resection.
- **Variables analyzed included:**
 - patient demographics
 - tumor characteristics
 - instances of neoadjuvant or adjuvant chemotherapy or radiotherapy
 - defect characteristics
 - reconstructive modalities performed.
- Recipient- and donor-site complications along with each patient's postoperative swallow assessments were also collected.

Table 1. Clinical Characteristics, Interventions, and Reconstructive Outcomes of Patients Undergoing Mandibular Reconstruction

Patient Number	Age at First Surgery (Months)	Tumor Diagnosis	Chemotherapy	Defect Type	Reconstructive Procedure(s)
1	193	Desmoid fibromatosis	Neoadjuvant Dacarbazine/doxorubicin	Subtotal HM (sparing condyle)	Procedure #1: Osseous fibula free flap Procedure #2: Placement of dental implants
2	192	Ameloblastoma	-	Complete HM	Osseous fibula free flap
3	96	Desmoplastic fibroma	-	Subtotal HM (sparing distal body)	Osseous fibula free flap
4	19	Desmoid fibromatosis	-	Complete HM	Osseous fibula free flap
5	30	Desmoid fibromatosis	Neoadjuvant Dacarbazine/doxorubicin	Subtotal HM (sparing condyle)	Osseous fibula free flap
6	142	Juvenile Aggressive Ossifying Fibroma	-	Complete HM	Osseous fibula free flap
7	191	Spindle Cell Sarcoma	Neoadjuvant Ifosfamide/doxorubicin	Subtotal HM (sparing condyle)	Osseous fibula free flap
8	121	Juvenile Aggressive Ossifying Fibroma	-	Subtotal HM (sparing condyle)	Osseous Fibula Free Flap with Placement of Dental Implants
9	46	Desmoid fibromatosis	Neoadjuvant Dacarbazine/doxorubicin	Subtotal HM (sparing distal body)	Osseous fibula free flap
10	25	Desmoid fibromatosis	-	Subtotal HM (sparing condyle)	Osseous fibula free flap
11	226	Desmoid fibromatosis	Neoadjuvant Dacarbazine/doxorubicin	Subtotal HM (sparing proximal condyle & body)	Non-vascularized fibular bone graft

Patient Number	Reconstructive Procedure(s)	Recipient Site Complications	Donor Site Complications
1	Procedure #1: Osseous fibula free flap Procedure #2: Placement of dental implants	Procedure #1: Hematoma requiring drainage	-
2	Osseous fibula free flap	-	Wound dehiscence
3	Osseous fibula free flap	-	Regional paresthesia (Plantar surface of foot)
4	Osseous fibula free flap	Non-union with partial resorption	-
5	Osseous fibula free flap	-	-
6	Osseous fibula free flap	-	-
7	Osseous fibula free flap	-	-
8	Osseous Fibula Free Flap with Placement of Dental Implants	Hematoma requiring drainage	Regional paresthesia (Dorsal surface of foot)
9	Osseous fibula free flap	Non-union with recurrence of tumor	-
10	Osseous fibula free flap	-	-
11	Non-vascularized fibular bone graft	-	-

RESULTS

- A total of 11 patients with a mean age of 116.5 months and mean follow-up of 28.6 months.
 - **Complete hemimandibulectomy:** 3 patients (27.3%)
 - **Subtotal hemimandibulectomy with sparing of the condyle:** 5 patients (45.5%)
 - **Subtotal hemimandibulectomy with incomplete resection of the body distally:** 2 patients (18.2%)
 - **Subtotal hemimandibulectomy with sparing of the body and condyle proximal to the sigmoid notch:** 1 patient (9.1%)
- Bony reconstruction performed with an osseous fibular free flap (OFFF) in 10 patients (90.1%). One patient (9.1%) with a post-ablative defect localized to the angle, ramus, and distal condyle underwent reconstruction with a non-vascularized fibular bone graft (NVFBG).
- **Complications with OFFF:** 2 patients developed a hematoma at the recipient site requiring evacuation; 2 patients experienced flap failure with 1 being due to recurrence of a desmoid tumor which subsequently invaded the neomandible. At the donor site, 2 patients developed regional paresthesia; 1 patient experienced wound dehiscence.
- **Complications with NVFBG:** none
- Dental reconstruction using osseointegrated dental implants performed in 2 patients (18.2%)
- All patients achieved satisfactory swallow outcomes following surgery and demonstrated no challenges when consuming food on the unaffected side of the mandible

CONCLUSION

This report demonstrates a unique application of cadaveric bone graft for secondary chest wall reconstruction in thoraco-omphalopagus conjoined twins. Reconstruction provided physical protection and support capable of strengthening mechanical function necessary for improved respiration.