Clavicular Bone Graft Harvest with Supraclavicular Artery Island Flap for Reconstruction of Composite Head and Neck Defect

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OBJECTIVE

- To present a novel application of pedicled supraclavicular artery island flap (SCAIF) with attached clavicular bone graft for head and neck reconstruction.
- At the conclusion of this presentation, participants should be able to discuss and compare different techniques and reconstructive options available for composite head and neck defect.

METHOD

Resection

- A 65 year-old Caucasian male presented with throbbing pain in the right side of his mouth radiating to the ipsilateral temporal bone for 3 months.
- He was found to have a 7 mm exquisitely tender, ulcerative lesion on the right floor of mouth.
- An incisional biopsy indicated SCC.
- Initially, he underwent tracheostomy placement, bilateral neck dissection of level IA to level III. Followed by excision of the floor of mouth cancer.
- A Synthes plate was fashioned in the shape of the mandible before any mandibulectomy cuts were made. A marginal mandibulectomy was performed, taking approximately 2/3 of the height of the mandible in the midline, leaving the inferior 1/3 of the mandible, including the cortex.

Reconstruction

- The supraclavicular artery was identified using SPY fluorescent imaging.
- A novel approach using a SCAIF with a clavicular bone graft attached was attempted to reconstruct the floor of mouth and mandibular defect. However, it was limited by the length of the pedicle.
- The decision was made to detach the clavicular bone graft from the flap, and implant into the mandibular defect.
- The contralateral SCAIF was raised and became the primary vascular supply for the clavicular bone graft.

Figure 1: Partial mandibulectomy and soft tissue defect.

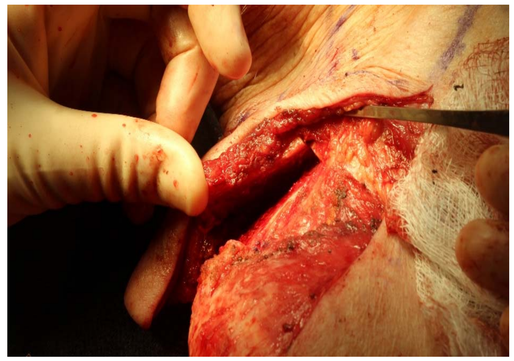

Figure 2: Clavicular Osteotomies for SCAIF.

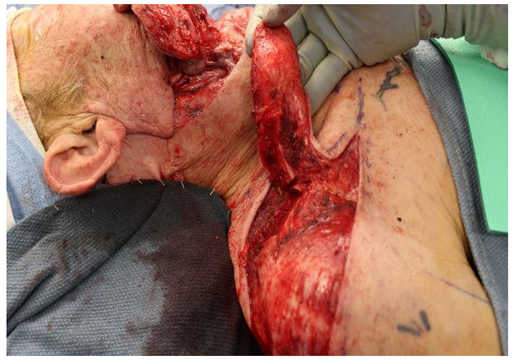

Figure 3: SCAIF osseous component raised.

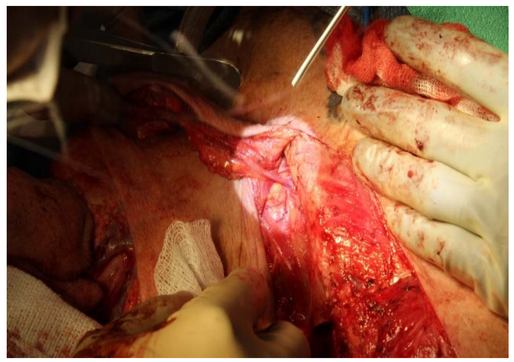

Figure 4: SCAIF osteocutaneous flap vascular pedicle.

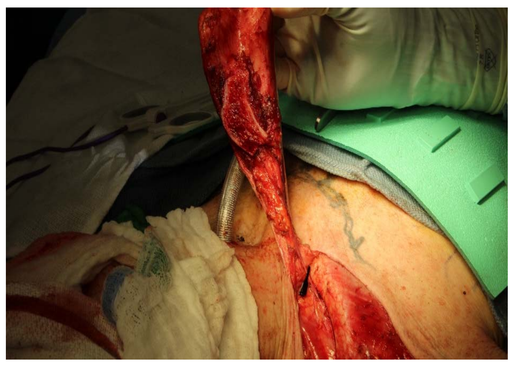

Figure 5: Skeletonized SCAIF pedicle for additional length.

Figure 6:Insetting of the SCAIF flap using ORIF hardware.

DISCUSSION

- SCAIF has reemerged in reconstructive surgery due to its ease of harvest, decrease in intraoperative time; and pliable skin that results in favorable color match for facial defects.
- One of the advantages of the SCAIF is the consistent location of the vascular supply.
- A novel approach using a SCAIF with a partial thickness clavicular bone graft was utilized to reconstruct the floor of mouth soft tissue defect and the segmental mandiblectomy defect.
- The bone graft was taken as a free graft instead of planned pedicled osteocutaneous flap due to the distance between mandibular symphysis and supraclavicular artery pedicle.
- The soft tissue defect including the free clavicular bone graft were covered with soft tissue component of the SCAIF

RESULTS

- Reconstruction of floor of mouth defect and marginal mandibulectomy using a free clavicular bone graft and SCAIF, obviating the need for additional bone graft donor site and morbidities associated with graft harvest.

CONCLUSION

- This is the first reported case to use a free clavicular bone graft and SCAIF for composite head and neck reconstruction.
- Depending on the location of the mandibulectomy defect the flap may be harvested as a pedicled flap with bone graft attached, but additional investigations are necessary.