

Endoscopic Repair of the Skull Base with Muscle Only ALT Free Flap

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INTRODUCTION

Complex skull base defects provide a reconstructive challenge, especially in the setting of prior infection or radiation with poor quality tissue or no tissue available for local flaps. Free flap reconstruction can be used for these cases, and a number of donor sites and inset techniques have been described for this purpose. The anterolateral thigh (ALT) is a versatile free flap used for reconstruction of head and neck defects.

METHOD

We reviewed the six patients who underwent complex endoscopic skull base repair using muscle only ALT free flaps at a single institution between January 2023 and January 2026.

CASE 1

69M with history of pituitary macroadenoma s/p partial resection, previously repaired with R tensor fascia lata button graft and R NSF

Indication for MVFF	Persistent CSF leak
MVFF	ALT inset via oropharynx
Recipient Vessels	R facial artery, external jugular vein tunneled through parapharyngeal space

CASE 2

73M with history of nasopharyngeal carcinoma treated 20 years prior with chemotherapy and radiation

Indication for MVFF	Osteoradionecrosis, low-flow CSF leak
MVFF	ALT inset via Caldwell-Luc, medial maxillectomy
Recipient Vessels	R facial artery, vein tunneled through cheek

FIGURE 1 ALT Flap during harvest



CASE 3

77M with history of complicated otitis media in the setting of uncontrolled diabetes s/p cervical fusion and canal wall down mastoidectomy

Indication for MVFF	Osteomyelitis of the temporal bone, petrous apex, clivus, and C1
MVFF	ALT inset via Caldwell-Luc, medial maxillectomy
Recipient Vessels	R facial artery, vein tunneled through cheek

CASE 4

70M with history of nasopharyngeal carcinoma treated 2 years prior with chemotherapy and radiation

Indication for MVFF	Recurrence, resection with endoscopic nasopharyngectomy
MVFF	ALT inset via Caldwell-Luc, medial maxillectomy
Recipient Vessels	R facial artery, vein tunneled through cheek

FIGURE 2 Approach for the pedicle, tunneled from cheek to neck



CASE 5

51F with history of suprasellar meningioma and intrasellar microadenoma s/p endoscopic endonasal resection

Indication for MVFF	CSF leak, E. coli meningitis complicated by bacteremia
MVFF	ALT inset transorally via soft palate
Recipient Vessels	R facial artery, vein tunneled through parapharyngeal space

CASE 6

71 F with history of adenoid cystic carcinoma of ethmoids and skull base treated 3 years prior with chemotherapy and radiation s/p open resection and repair with local flap

Indication for MVFF	Recurrence, resection with bifrontal craniotomy
MVFF	ALT inset via nasal cavity
Recipient Vessels	Superior temporal artery, vein tunneled through cheek

CONCLUSION

Muscle only ALT is a versatile option for reconstruction of skull base defects and is effective not only to seal and prevent CSF leaks but also to treat a wide range of conditions, including advanced skull base osteomyelitis and osteoradionecrosis by providing fresh tissue to the region. At least two different pathways for the pedicle are effective.