Nontraditional Approaches to Reconstruction of Large Anterior Skull Base and Midface Defects

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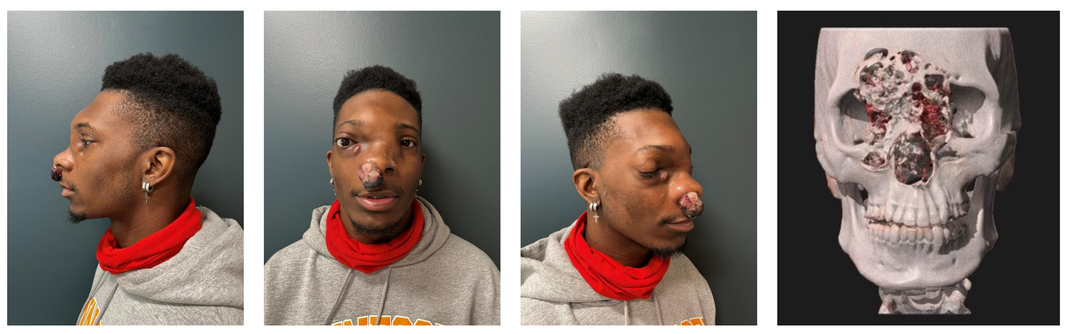
Introduction

Large anterior skull base and midface defects pose significant challenges to the reconstructive surgeon, often requiring a multidisciplinary approach to achieve an optimal outcome. Defects of this nature can result from various etiologies including trauma, oncologic resection and congenital abnormalities. Reconstruction of these defects requires a thorough understanding of the anatomical and functional relationships of the midface and anterior skull base the goal of this study is to present 2 cases of significant skull base defects and review the decision-making process for reconstructing these defects.

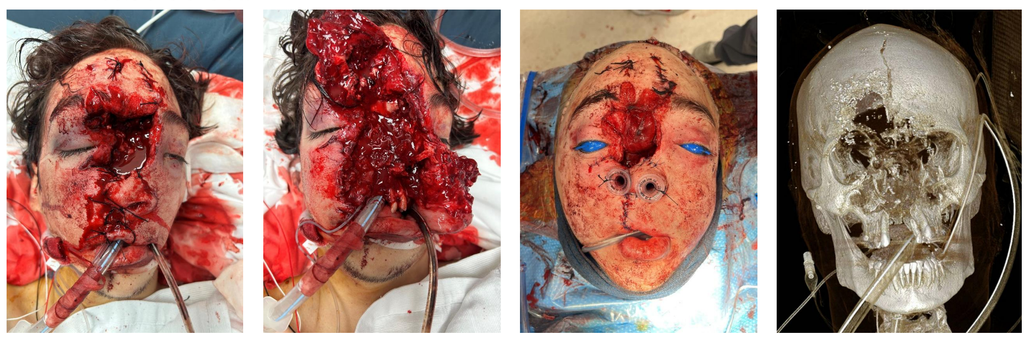
Methods

A case-centric approach was employed.

Case 1: A 26-year-old male patient presented with a T4 mesenchymal chondrosarcoma of the nasal cavity, which had invaded the anterior skull base.



Case 2: A 22-year-old male patient suffered a gunshot wound (GSW) to the midface, resulting in significant midfacial deformity and an anterior skull base defect.



Proposed Algorithm

Patient with large anterior skull base and midface defect

→ Stage 1: Soft tissue free flap for dural repair and to restore soft tissue bulk

→ Stage 2: Osseus free flap to restore structure to midface

→ Subsequent stages: Revisions to further fine tune aesthetic and functional result

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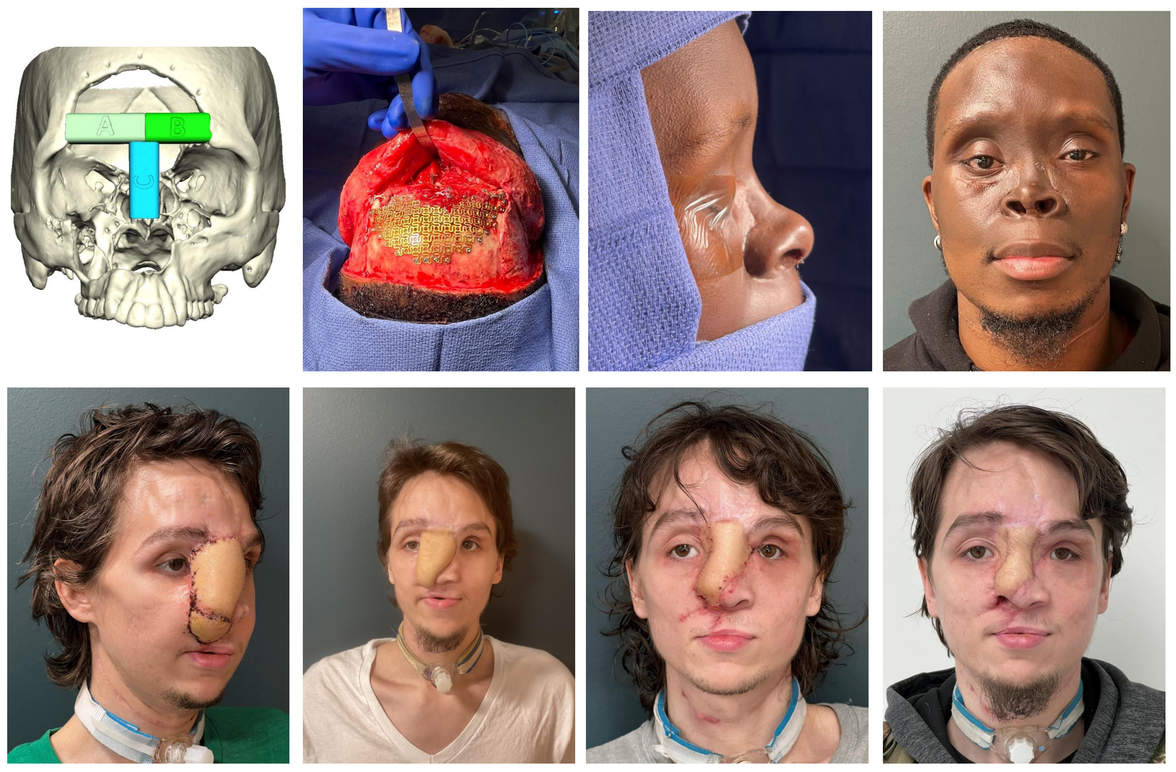
Results

Both patients had large midface deformities and anterior skull base defects that required significant reconstruction. Our approach to these patients was a multistage approach. The goal of the first stage was first restore soft tissue bulk with a soft tissue flap such as the anterolateral thigh free flap with the goal to seal any dural skull base defects. Later stages are reserved for reconstruction of anatomical units of the nose and NOE segments and optimizing aesthetic results.

Stage 1: Patients underwent soft tissue reconstruction with ALT free flap

Subsequent Stages: Patients underwent reconstruction of anatomical subunits



Conclusion

Reconstruction of large anterior skull base and midface defects is a complex and challenging process. The two case reports presented demonstrate the use of staged reconstruction soft tissue and osseus free flaps and highlights and an algorithm for managing these challenging defects. Further research is needed to optimize reconstructive outcomes and minimize morbidity in these patients. These findings emphasize the importance of a tailored, patient-specific approach in addressing the functional and aesthetic complexities associated with such defects.