Endoscopic Skull Base Reconstruction

An Evolution of Materials and Methods

Aaron C. Sigler, DO, MS[a], Brian D'Anza, MD[b], Brian C. Lobo, MD[c], Troy Woodard, MD[d], Pablo F. Recinos, MD[e], Raj Sindwani, MD[d,*]

KEYWORDS

• Nasoseptal flap • CSF leak repair • Skull base defect repair • Pericranial flap
• Endoscopic endonasal approach • Graduated approach to reconstruction

KEY POINTS

- Certain independent factors affect the decision-making process in selecting the appropriate repair type and the use of a vascularized flap, including size/extent of skull base defect, entrance into an intracranial cistern or ventricle, disorder type (eg, craniopharyngioma, meningioma), disease process (Cushing disease), and body habitus (morbid obesity).
- Cerebrospinal fluid (CSF) leak type (divided among no leak, low flow, and high flow) is a major factor guiding selection of the appropriate repair type.
- Repair of endoscopic skull base defects and CSF leaks in general can include synthetic and autologous dural replacement grafts, free autografts, local and distal vascularized flaps, and even free tissue transfer.
- A graduated laddered approach to skull base reconstruction provides a framework to guide selection of repair technique to ensure a successful outcome while minimizing morbidity for the patient.

[a] Tulane Center for Clinical Neurosciences, Department of Neurosurgery, 131 S. Robertson St., Ste 1300, New Orleans, LA 70112, USA; [b] Section of Rhinology, Sinus and Skull Base Surgery, University Hospitals – Case Western Reserve University, 11000 Euclid Avenue, Cleveland, OH 44106, USA; [c] Section of Rhinology, Sinus and Skull Base Surgery, Head and Neck Institute, Cleveland Clinic, 9500 Euclid Avenue, A71, Cleveland, OH 44195, USA; [d] Minimally Invasive Cranial Base and Pituitary Surgery Program, Section of Rhinology, Sinus and Skull Base Surgery, Head and Neck Institute, Rosa Ella Burkhardt Brain Tumor Center, Cleveland Clinic, 9500 Euclid Avenue, A71, Cleveland, OH 44195, USA; [e] Minimally Invasive Cranial Base and Pituitary Surgery Program, Section of Rhinology, Sinus and Skull Base Surgery, Head and Neck Institute, Rosa Ella Burkhardt Brain Tumor Center, Cleveland Clinic, 9500 Euclid Avenue, S73, Cleveland, OH 44195, USA
* Corresponding author.
E-mail address: sindwar@ccf.org

Otolaryngol Clin N Am ■ (2017) ■–■
http://dx.doi.org/10.1016/j.otc.2017.01.015 **oto.theclinics.com**
0030-6665/17/© 2017 Elsevier Inc. All rights reserved.

INTRODUCTION

Endoscopic skull base techniques have advanced greatly over the years owing to various technological advances, including angled endoscopes, high-definition monitors, frameless navigation systems, high-resolution imaging, and improved anatomic knowledge. Perhaps the greatest innovations in endoscopic skull base surgery have come in the treatment of complex skull base defects and cerebrospinal fluid (CSF) leaks. Effective watertight repair of complex defects after skull base tumor resection emerged as the primary limitation to the endoscopic resection of advanced disorders. Thus, the ability to effectively reconstruct defects in this area represents a pivotal step in the ability to pursue endonasal endoscopic approaches. Over the past decade there have been considerable advances in the ability to reconstitute the separation between the intracranial and sinonasal compartments after endonasal skull base surgery. This article explores the methods and the materials used to accomplish skull base repair, discusses the indications for their use, and reviews the outcomes as reflected in the current literature.

ENDOSCOPIC SKULL BASE RECONSTRUCTION

Surgical treatment of skull base lesions of all types can be thought of as comprising 3 parts: approach, resection, and reconstruction. Endoscopy has provided an innovative, minimally invasive approach to various disease processes, but adoption was hampered by higher rates of CSF leaks. However, for endoscopic skull base surgeons, multiple methods developed over the last decade have assisted in providing the ability to improve outcomes and decrease leak rates. Modern repair processes include synthetic absorbable sealants and glues, synthetic dural replacement grafts, free autografts, vascularized flaps (both intranasal and extranasal), and free tissue transfer (**Table 1**). Although dependent on the type of CSF leak and type of defect, repair is typically accomplished using a multilayered closure using an underlay (subdural or epidural), an overlay graft or flap, and various types of intervening absorbable hemostatic agents (eg, cellulose, gelatin foam) alone or in combination with an absorbable glue or sealant.[1,2] The available options for repair are described here.

Free Autografts

Autografts, including free mucosa, fat, and fascia lata,[2] provided the first options for skull base reconstruction, and are still excellent options (**Table 2**). Fascia lata grafts are harvested from an incision (or 2 incisions with the less invasive technique) on the lateral thigh and offer a durable onlay material. The major drawbacks to the use of fascia lata are possible wound-related issues, especially in young physically active patients. The fat graft, typically involving abdominal adipose tissue, provides a suitable subdural inlay substance that is best used to fill large cavities left behind by resection

Table 1
Free autografts

Local Grafts	Remote Grafts
Inferior turbinate mucosa	Fat (adipose)
Middle turbinate mucosa	Fascia lata
Septal mucosa	Bone (split calvarial)
Bone (vomer)	

Download English Version:

https://daneshyari.com/en/article/5715629

Download Persian Version:

https://daneshyari.com/article/5715629

Daneshyari.com