



Use of medical aural and encephalic glue-soaked gelfoam for frontal sinus repair: A single-centre experience



Heng-Jun Zhou, Ren-Ya Zhan, Xiu-Jue Zheng*, Gu Li, Fei Cao, Man-Tao Chen

Department of Neurosurgery, First Affiliated Hospital, College of Medicine, Zhejiang University, 79 Qingchun Road, Hangzhou 310003, China

ARTICLE INFO

Article history:

Paper received 2 August 2012

Accepted 4 January 2013

Keywords:

Frontal sinus

Gelfoam

Medical aural and encephalic glue

Reconstruction

ABSTRACT

Background: Frontal sinus (FS) perforation is a common complication in frontal craniotomy. The primary goal of treatment is to seal the FS without destroying physiological function.

Objective: This article describes a new FS cavity reconstruction technique using medical aural and encephalic glue (EC glue)-soaked gelfoam.

Methods: Between 2007 and 2012, 118 patients underwent FS reconstruction using EC glue-soaked gelfoam. The FS cavity was reconstructed in all patients and no patient experienced intracranial infection, frontal sinusitis, or cerebrospinal fluid (CSF) leakage.

Results: Restoring physiological function is the primary goal of FS reconstruction. Difficulty often arises in sealing the sinus opening, especially when the mucosa is damaged. Mucosal border dissection and electric coagulation of the mucosal laceration can help to reconstruct the mucosal cavity. Sealing the sinus with autogenous or exogenous material, such as fascia, bone flap or gelfoam carries increased risks of intracranial infection, frontal sinusitis, and CSF leakage in the short term, and increased the occurrence of a FS mucocoele in the long term. Gelfoam saturated with EC glue obtained good results.

Conclusion: We describe the application of gelfoam saturated with EC glue to treat an open FS with or without mucosal violation during frontal craniotomy. Gelfoam saturated with EC glue is a quick, effective, low-cost and reliable means of sealing the FS while preserving its physiological function.

© 2013 European Association for Cranio-Maxillo-Facial Surgery. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Inadvertent perforation into the frontal sinus (FS) is a common complication in frontal craniotomy. The incidence has not been reported, but largely depends on the bone flap size and FS size and development. Several autogenous and exogenous materials have been used to seal the sinus, including fat, fascia, muscle, bone flap, and gelfoam, but these materials often achieve only incomplete sealing (Couldwell and Weiss, 1993, Mann et al., 1989, Mori et al., 2003, Raquel et al., 2011, Rita et al., 2000). Postoperative complications include intracranial infection, frontal sinusitis, and cerebrospinal fluid (CSF) leakage in the short term and FS mucocoele in the long term (Meetze et al., 2004). Gharabaghi et al. (2008) used neuronavigation to identify and preserve the FS during fronto-lateral craniotomies, and no unintended opening of the FS or orbit occurred in any of their 45 cases. However, accidental entrance is

more likely with a well-developed FS (Lee et al., 2010). Rita et al. (2000) found that FS or orbital entry was not uncommon during pterional craniotomy, and was more frequent during frontal craniotomy. Many techniques have been used to treat an inadvertently opened sinus. Traditional mucosal ablation with material obliteration or cranialization of the FS has fallen out of favour, with more surgeons currently preferring sinus reconstruction (Mann et al., 1989, Sbordone et al., 2012). Sinus closure using gelfoam saturated with medical aural and encephalic glue (EC glue) has not been previously described. This technical note describes a case series of open FS treated successfully with gelfoam saturated with EC glue.

2. Material and Methods

Between 2007 and 2012, 118 patients underwent sinus reconstruction at the First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou, China, using gelfoam saturated with EC glue. Forty-nine patients were female and 69 patients were male, ranging in age from 14 to 78 (mean 48) years. No patient had a history of chronic sinus infection. All patients underwent frontal craniotomy complicated by entry into the FS. The cases involved an

Abbreviations: CSF, cerebrospinal fluid; CT, computed tomography; EC glue, medical aural and encephalic glue; FS, frontal sinus; MRI, magnetic resonance imaging.

* Corresponding author. Tel.: +8613989464002.

E-mail address: jhw_hz@163.com (X.-J. Zheng).

olfactory groove meningioma resection (29 cases), giant pituitary adenoma resection (26 cases), craniopharyngioma resection (22 cases), frontal lobe glioma resection (19 cases), Rathke cleft cysts resection (14 cases), and aneurysm clipping (8 cases). In 26 patients who had an open FS with intact mucosa, the sinus opening was sealed using gelfoam saturated with EC glue to create a bony cavity. The majority ($n = 92$) of patients had mucosal violation (Table 1), and the mucosal cavity was reconstructed in these cases by dissecting the mucosal borders and electrically coagulating the mucosal laceration. Gelfoam saturated with EC glue was used in all cases for FS reconstruction. No patient developed intracranial infection, frontal sinusitis, or CSF leakage in the short term (3 months–1 year) and 58 patients had no FS mucocoele in the long term [1–4 (mean 2.2) years]. The following is a case presentation of FS entry following a craniotomy to treat Rathke cleft cysts.

A 41-year-old man underwent sellar mass resection *via* transfrontal craniotomy (Fig. 1A–D). The procedure was complicated by inadvertent FS entry with mucosal violation. The cavity was first

covered with a piece of cotton soaked in povidone-iodine before the dura mater was opened (Fig. 2C). We reconstructed the FS after the intracranial procedures were completed and the dura mater was closed. The cotton was removed and a nerve dissector was used to dissect the mucosa meticulously from the anterior and posterior bony walls of the sinus towards the nasal recess. Electric coagulation was used to rebuild the mucosal cavity, after which the sinus was promptly sealed with a correctly sized piece of gelfoam injected with EC glue, which was flattened at the sinus opening. Finally, the mucosa of the corresponding bone flap was burred away (Fig. 2C–G; see Supplemental Video, which shows the use of gelfoam and EC glue to repair an intraoperatively opened FS). For two days postoperatively, a small amount of serosanguinous fluid drained from a subcutaneous drainage tube, which was removed on postoperative day 2. Clinically, the patient recovered well without headache, fever, or CSF leakage from the nose or mouth. On postoperative day 7, a lumbar puncture revealed no evidence of intracranial infection. Pathological examination confirmed that the lesions were Rathke cleft cysts, and no neurological dysfunction was observed postoperatively. The patient was discharged on postoperative day 12. Over the subsequent 3 years, the patient's incision remained dry with no headache, fever or otolaryngological complication. A computed tomography (CT) scan obtained 2 months after surgery showed that the reconstructed mini-FS was sealed well with gelfoam saturated with EC glue (Fig. 1C). Magnetic resonance imaging (MRI) identified no mucocoele formation over 3 years and confirmed that the reconstructed mini-FS and frontonasal duct were intact (Fig. 1D). The patient has remained asymptomatic.

Supplementary video related to this article can be found at <http://dx.doi.org/10.1016/j.jcms.2013.01.006>.

Table 1
Indications for frontal craniotomy.

Diseases	Opened frontal sinus with intact mucosa	Opened frontal sinus with mucosal violation	Total
Olfactory groove meningioma	6	23	29
Giant pituitary adenoma	5	21	26
Craniopharyngioma	5	17	22
Frontal lobe glioma	5	14	19
Rathke cleft cysts	3	11	14
Aneurysm	2	6	8
	26	92	118

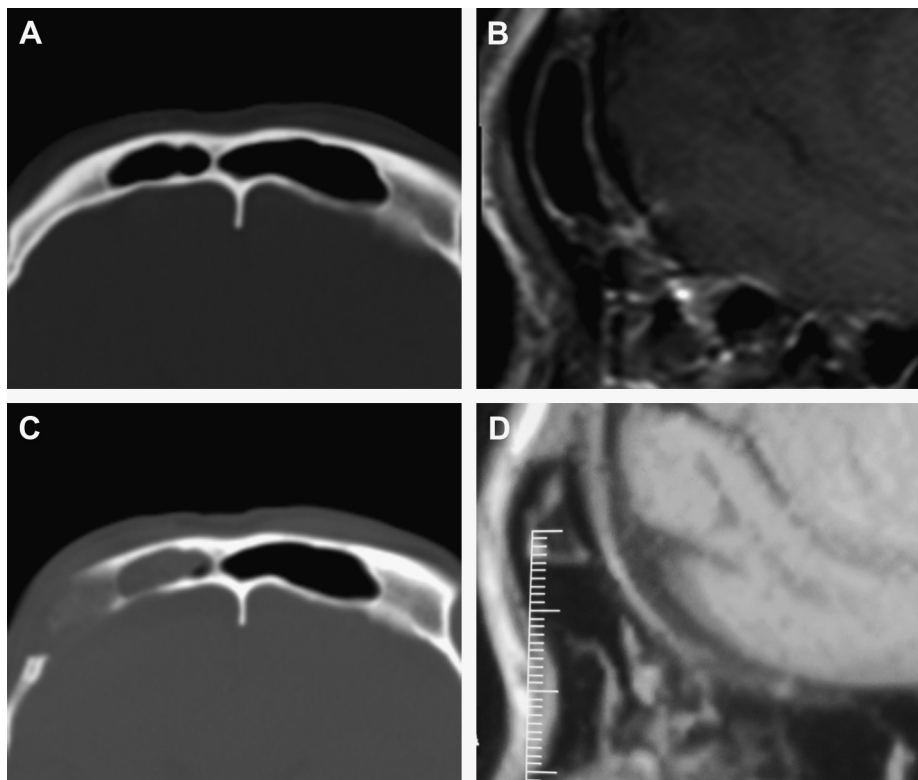


Fig. 1. A patient with Rathke cleft cysts underwent transfrontal craniotomy. A, intact FS, CT scan before surgery (axial). B, intact FS and frontonasal duct, MRI before surgery (sagittal). C, the FS opening was sealed with gelfoam saturated with EC glue; CT scan, 2 months after surgery (axial). D, the functional mucosal layer was reconstructed to restore mini-FS physiological function, 3 years after surgery (sagittal MRI). CT, computed tomography; EC glue, medical aural and encephalic glue; FS, frontal sinus; MRI, magnetic resonance imaging.

Download English Version:

<https://daneshyari.com/en/article/6052891>

Download Persian Version:

<https://daneshyari.com/article/6052891>

[Daneshyari.com](https://daneshyari.com)