Mini-Trephination and Irrigation of the Frontal Sinus

Surgical Technique

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Philosophy
Patients with frontal sinus disease most commonly present to the otolaryngologist with pressure in the frontal region. Frontal sinus disease is suggested by abnormalities in the nasal frontal recess on nasal endoscopy and is confirmed with coronal CT scans. Our radiologist’s protocol is to obtain an axial image of the frontal sinus whenever a positive frontal sinus scan is seen on coronal imaging. Anterior and posterior measurements are then recorded at the trephine site to avoid posterior frontal sinus penetration during the trephine procedure.

If computer-assisted navigation is used, it may be utilized to assess the anterior to posterior frontal sinus dimension. A study by Gallagher and Gross (1999) showed frontal sinus mini-trephination with the Medtronic ENT mini-trephination set to be a safe and effective adjunct to frontal sinus surgery.

Nota Bene: The technique description herein and the use of instructions for the related procedures are made available by Medtronic ENT to the healthcare professional to illustrate the author’s suggested treatment for the uncomplicated patient. In the final analysis, the preferred treatment is that which, in the healthcare professional’s judgment, addresses the needs of the individual patient.

Surgical Technique
This technique is minimally invasive and may be performed under local or general anesthesia. The skin is prepped in a standard fashion and the landmarks (supraorbital foramina) are palpated. A line is visualized between these landmarks (Figure 1). The trephine hole will be located along this line and is usually camouflaged in the medial eyebrow. Local anesthesia is injected into the most medial and superior aspects of the brow for hemostasis in all cases.

A small skin incision is made with an eleven blade to accommodate the drill guide with skin protector sleeve. The teeth of the skin protector are used to firmly seat the device on the frontal periosteum (Figure 2). The drill easily inserts through the sleeve protector (Figure 3). The drill console is set to 6000 RPM in a forward mode. The drill is activated prior to being engaged against the bone. Then, with gentle pressure, the drill penetrates the front table.

Note: The drill is designed to allow up to 7.0 mm of penetration when it is maximally engaged into the protective sleeve. Patients with very narrow frontal sinuses may not be able to tolerate the full 7.0 mm depth of penetration. The CT scan is an important reference for your particular patient.

The drill is removed and the guide pin is placed through the drill guide’s protector sleeve to maintain the trephine location (Figure 4). The drill guide is then removed, leaving the guide pin in the drilled hole. A tapered-tip irrigation cannula slides over the guide pin and presses securely into the frontal bone (Figures 5A and B).
At this point, the guide pin is removed and a syringe containing sterile saline is connected to the cannula (Figure 6). Aspiration verifies proper placement when air or mucopus is returned into the tubing. Failure to obtain air or mucus means that the irrigation cannula is not properly seated. Possibilities include 1) it is not completely through the front table of the sinus, 2) the contents of the sinus are too thick to allow aspiration, 3) the irrigation cannula is through the bone, but still submucosal in the sinus, or 4) the irrigation cannula is plugged. In any event, the entire front table penetration hole should be re-evaluated with replacement of the guide pin and re-evaluation considering the CT scans prior to any irrigation being performed.

Once proper cannula placement is confirmed, irrigation may begin while observing endonasally with an endoscope. During irrigations, secretions should evacuate through the nasofrontal recess and into the nasal cavity (Figure 7). The scrub nurse should watch the patient’s eye to make sure that there is no extravasation in the forehead or eye region while the surgeon is evaluating the nasofrontal recess.

This simple procedure allows for treatment of frontal sinus disease without traumatizing the nasofrontal recess. Additionally, the irrigant may be used as a guide to help locate the frontal sinus drainage pathway in difficult or revision cases. The surgeon uses not only the return of the irrigation to a clear stream of water as indication for surgical success, but over time a feel is obtained for how easily the water is irrigated in terms of the patency of the outflow tract.

Reference
Mini-Trephination Set, Complete
1892000

Complete set* includes:
- 1882900, 2.0 mm Drill
- 1892001 Drill Guide
- 1892002, Guide Pen
- 1892003, Irrigation Cannula
- 3717005, Instrument Tray (not shown)
- Irrigation tubing sold separately

*Note: This set is only available in the US. If you are not in the US, please order the above items individually.

IPC® System
IPCSYSKIT

Kit* includes:
- IPC® Console (1898001)
- IPC Multi-Function Footpedal (1898430)
- Power Cord, 6 Meter, IEC 320, 115V (1897821)
- IPC Manual (1898851)
- Basket (1897510)

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1892004
- 1 each
- Mini-Trephination and Irrigation of the Frontal Sinus
- Mini-Trephination Set – Surgical Technique Video (VHS) by Barry Schaitkin, MD

Surgical Techniques CD
891104
- 1 each
- Compendium of Advanced Powered Surgical Techniques CD