Supraorbital Eyebrow Approach for Clipping of Multiple Aneurysms

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Introduction

Minimally invasive craniotomies for aneurysm clipping are alternative approaches that aim to provide the necessary exposure while limiting soft-tissue disruption, improving cosmesis and decreasing our surgical footprint. The supraorbital "eyebrow" approach provides a panaromic view of the Circle of Willis and presents an attractive surgical option in the hands of experienced microneurosurgeons.

We present a case of multiple unruptured anterior circulation aneurysms treated with microsurgical clip occlusion via a supraorbital approach.

Case Presentation

- 59F with history of an enlarging right MCA aneurysm as well as a stable ACoA aneurysm (**Fig. 1)**
- Neurologically intact at baseline

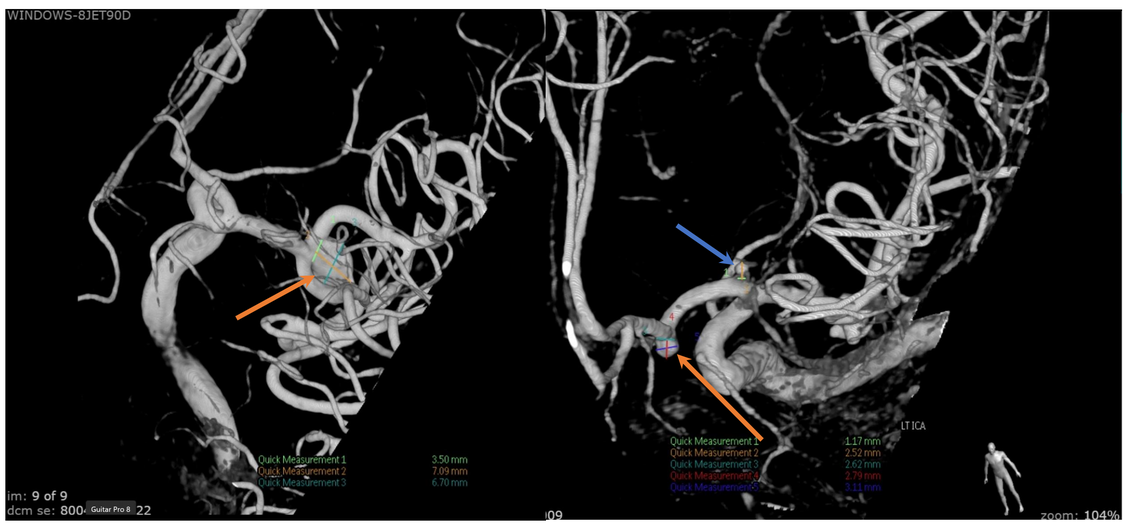

Figure 1. Preoperative DSA demonstrating a right MCA aneurysm (**orange arrows; shown in both panels**) and an ACoA aneurysm (**blue arrow; shown in right panel only**)

Treatment Options

- Microsurgical clip occlusion was weighed against endovascular occlusion
- Supraorbital "eyebrow" approach was chosen due to:
  - Excellent **cosmesis**
  - Minimal risk of injury to the frontalis branch
  - Minimal risk of injury to the temporalis muscle
  - **Panoramic exposure** of the Circle of Willis
  - **Perpendicular view** to both aneurysm necks
  - Early **proximal control**
  - Quick and simple exposure

Key Operative Steps

- **Approach**: Supraorbital eyebrow craniotomy for minimally invasive access to Circle of Willis **(Fig. 2)**
- **Exposure**: Subfrontal exposure and Sylvian fissure split **(Fig. 3)**
- **Control**: ICA exposed for proximal control; temporary clip applied **(Fig. 4)**
- **Target 1**: MCA aneurysm exposed and definitive clip positioned on aneurysmal neck **(Fig. 5)**
- **Target 2**: ACoA aneurysm exposed and definitive clip placed on aneurysmal neck **(Fig. 6)**
- **Final View**: Exposure of the optic apparatus and supraclinoid ICA **(Fig. 7)**

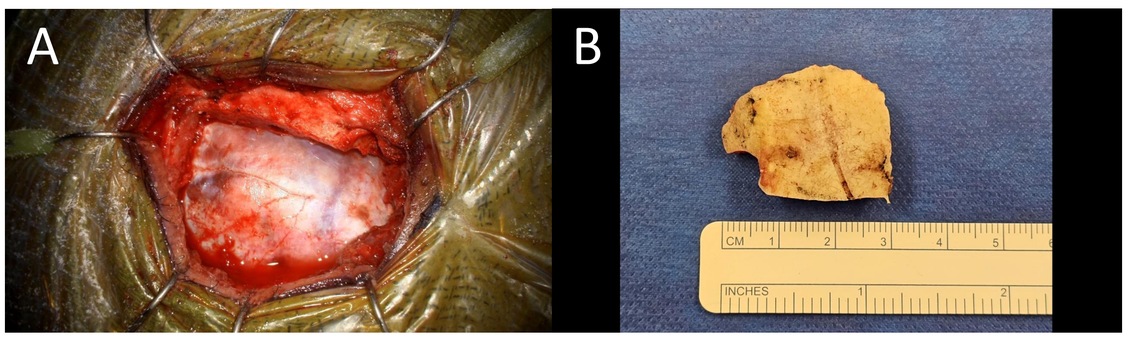

Figure 2. Intraoperative view of the supraorbital craniotomy (A) and the removed supraorbital bone flap (B).

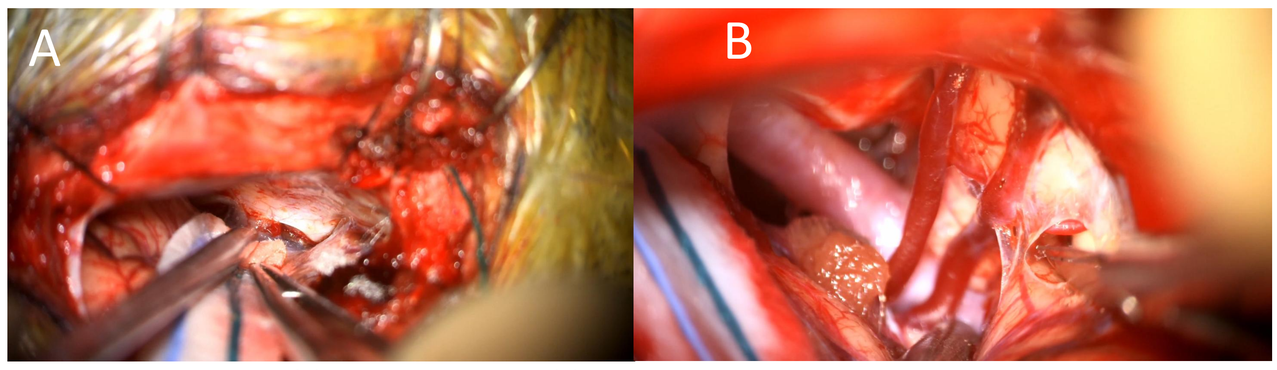

Figure 3. Subfrontal exposure**(A)** and Sylvian fissure split**(B)**.

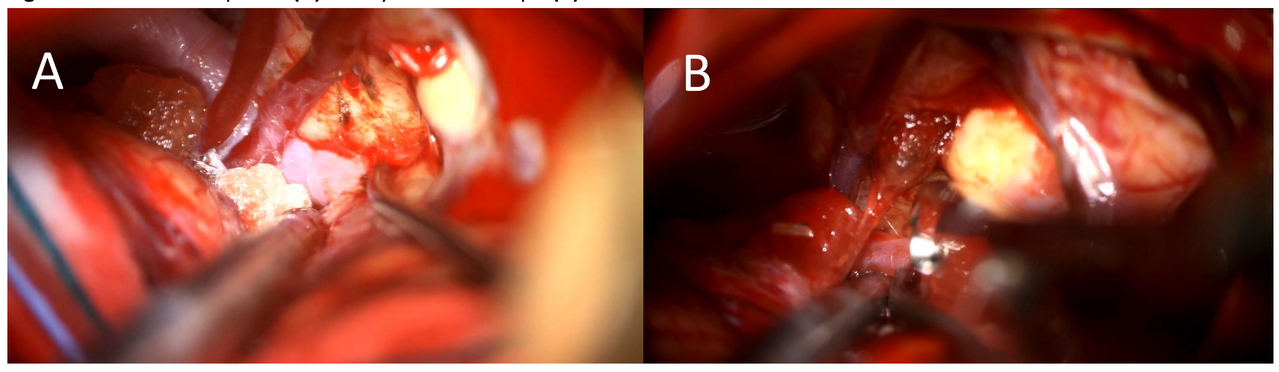

Figure 4. Proximal control: Exposure of ICA bifurcation **(A)** and placement of temporary clip on M1 **(B)**.

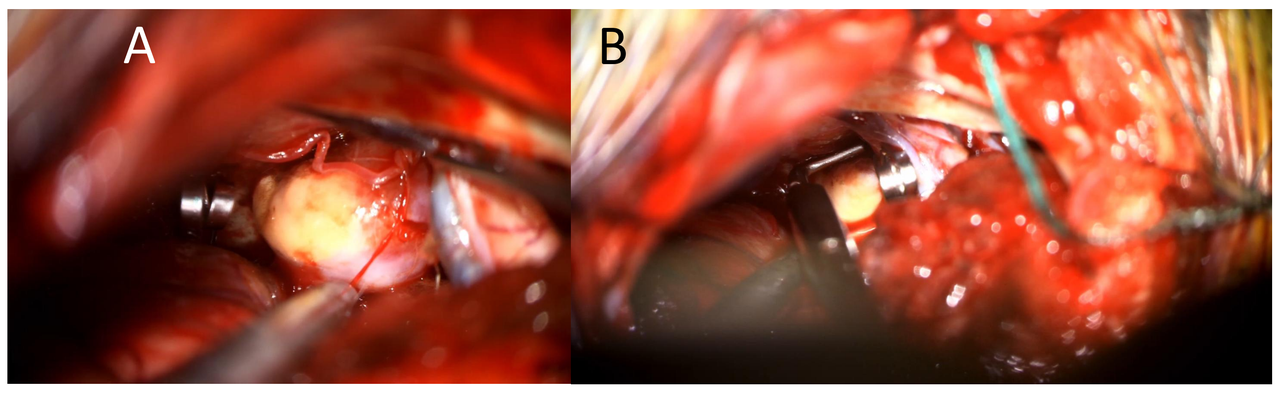

Figure 5. MCA aneurysm clipped: Exposure of aneurysm **(A)** and placement of definitive clip **(B)**.

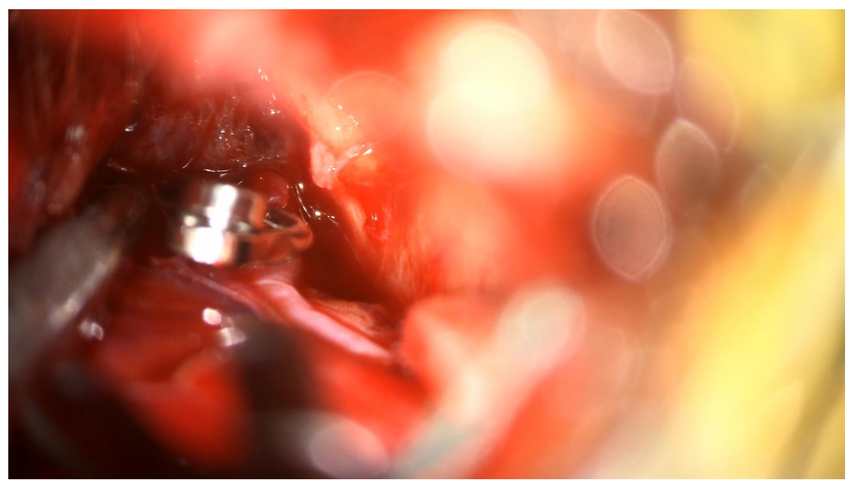

Figure 6. Definitive clip placed on ACoA aneurysm

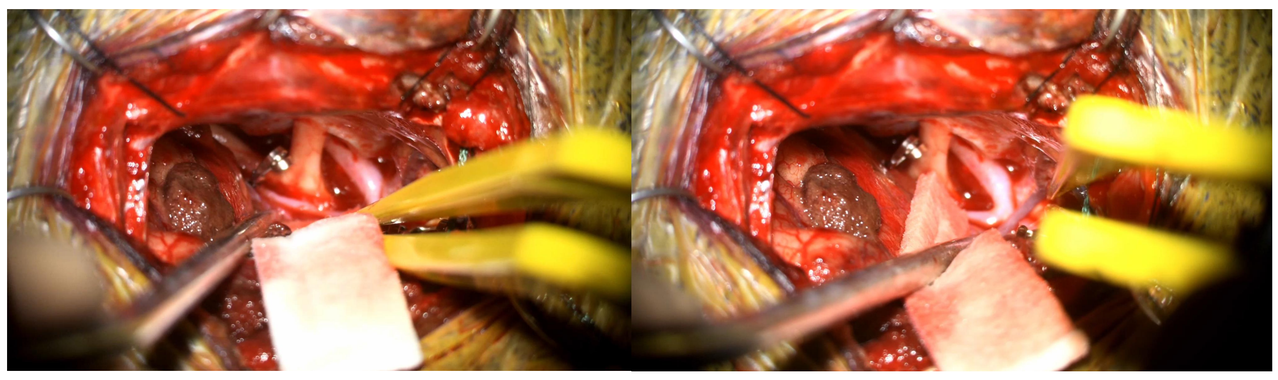

Figure 7. Exposure of the optic apparatus **(A)** and complete supraclinoid ICA **(B)**

Outcome and Conclusions

- Complete occlusion of both aneurysms with no residual necks was confirmed via postoperative angiography
- The patient remained neurologically intact following surgery and discharged POD #2

In select patients, the supraorbital "keyhole" craniotomy is a valuable approach for microsurgical aneurysm clipping, providing a minimally invasive corridor with rapid access to the Circle of Willis and panoramic visualization of anterior circulation.

Contact

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