

Endonasal endoscopic Multilayer repair starting with underlay bony graft as a long-term successful management of CSF rhinorrhea

Mohamed Elkahwagi, MD, Mansoura University, Egypt

Objective: Cerebrospinal fluid (CSF) leak occurs because of communication between the subarachnoid space and nasal cavity. Transnasal endoscopic repair is the widely accepted approach as it gives the best exposure with least morbidity and mortality. Underlay strong grafting of the defect size is supposed to give the best success results.

Methods: This is a retrospective study of cases of CSF rhinorrhea that were admitted with us within the period from January 2021 till 2024. Cases who had persistent rhinorrhea despite appropriate conservative management for 1 month were surgically included. Preoperative CT and MRI nasal and PNS were performed for preoperative suggestion of the defect site. Perioperative measurement of the CSF pressure was performed for all cases to guide the postoperative management of high intracranial pressure. Perioperative intrathecal fluorescein injection was performed to help identification of the defect size. Endonasal endoscopic multilayer repair starting with underlay grafting of the defect size with bone chips from the sinuses was the proposed method for repair in all cases. Postoperative management of intracranial tension was offered to all cases. Follow up of the cases for 6 months postoperatively was performed to check for any recurrence .

Results: Twenty cases were identified and included in the study period. The defect site was identified as following, **cribriform plate** (N=7), **lateral lamella** (N=4), **fovea ethmoidalis** (N=2), **lateral wall sphenoid sinus** (N= 2), **infrasellar sphenoid sinus** (N= 3), and **posterior wall frontal recess and sinus** (N= 2). Meningoceles were identified with variable sizes from 2 to 30 mm at the defect site. Management of herniated meningoceles was accomplished via cauterization till we could identify the boundaries of the defect site. No major postoperative complications were reported. Recurrence of CSF rhinorrhea was encountered in one case who had high preoperative CSF pressure (55 cm H2o) and she was managed with VP shunt with neurosurgery team to manage the high ICP.

Conclusion: Optimum identification of the defect site is the first step of success. No cutting, no pulling of the meningocele, just cauterization till identification of the skull base defect. Multilayer repair of the defect site is important and gives sense of security. No need for nasal packing at the end of the procedure. Postoperative management of high CSF pressure is essential to maintaining success.

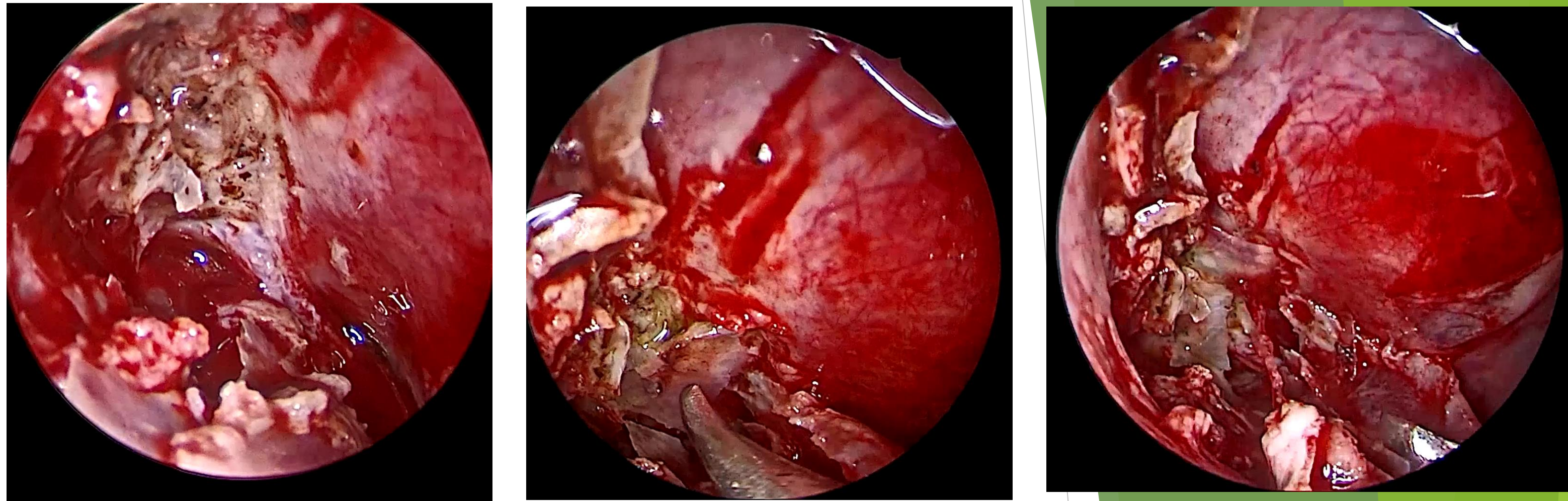


Figure 1: skull base defect at the right cribriform plate with illustration of the underlay bony reconstruction

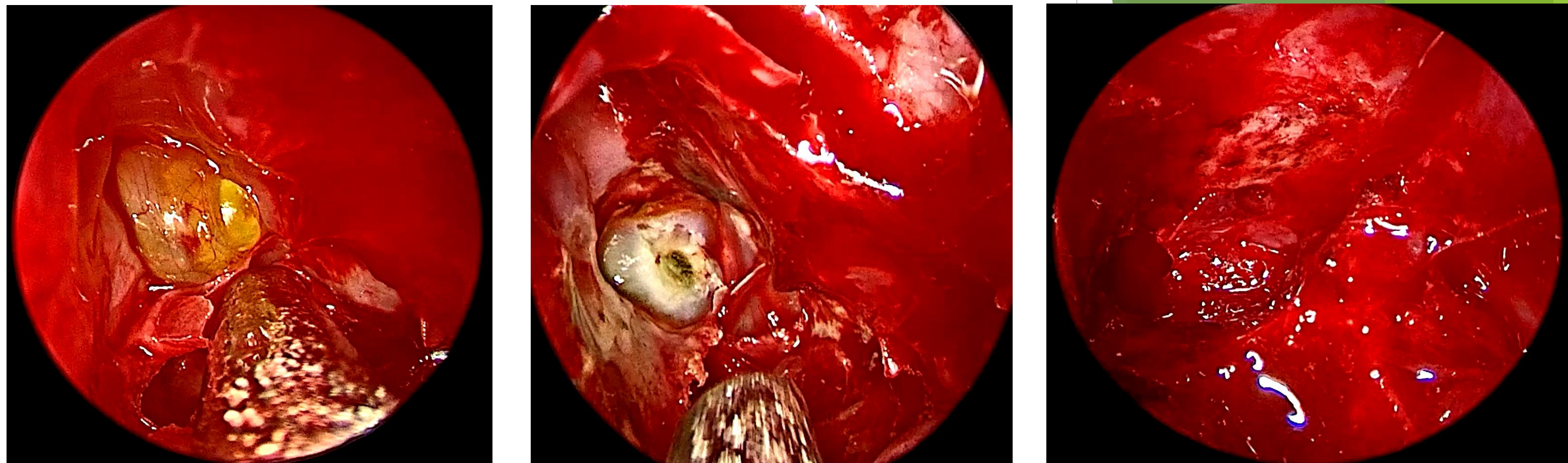


Figure 2: skull base defect and meningocele at the fovea ethmoidalis with reconstruction

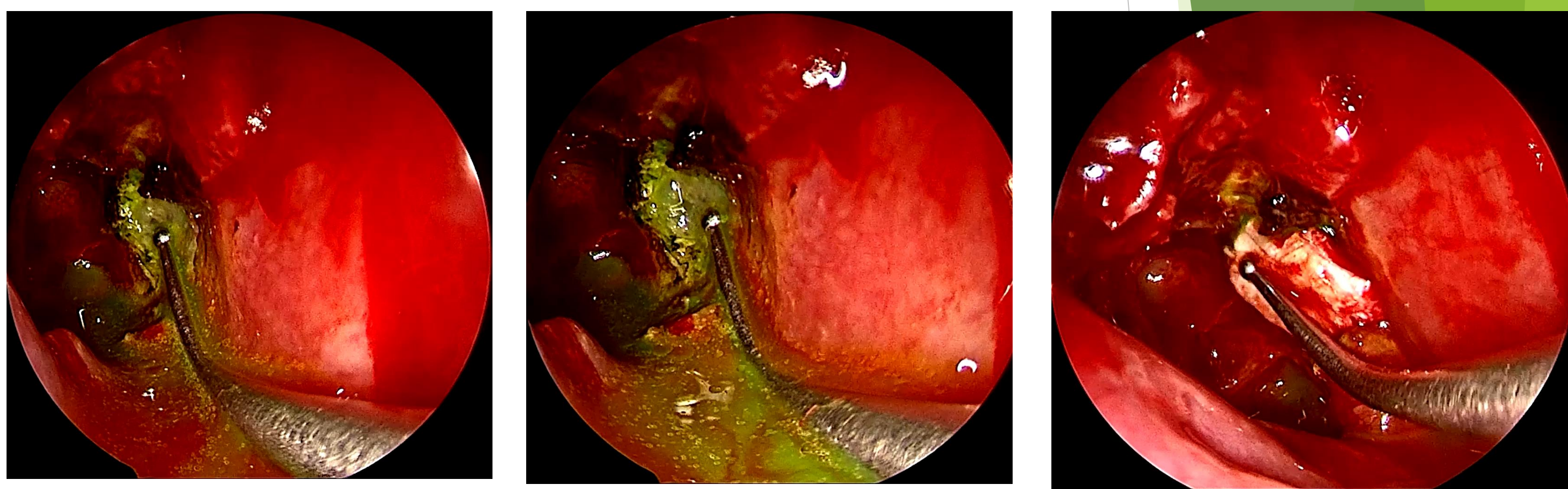


Figure 3: skull base defect at the lateral lamella on the right side with underlay bone reconstruction and facia lata as overlay reconstruction

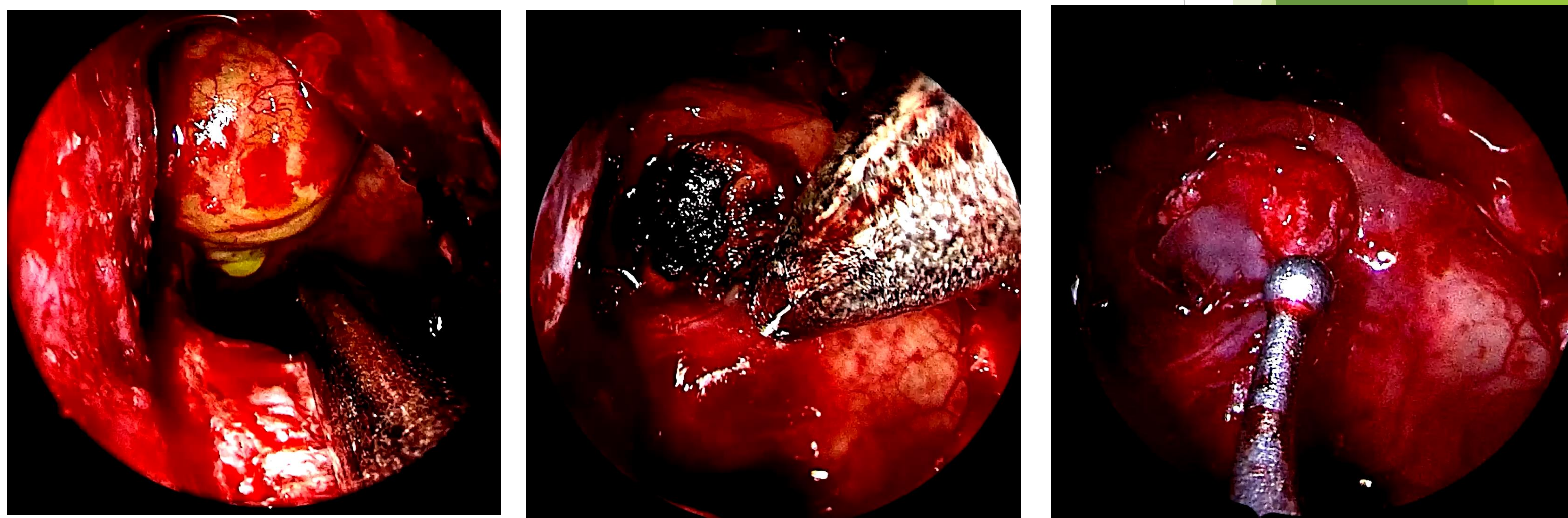


Figure 4: Huge meningocele from the planum sphenoidale, cauterized and skull base reconstructed in multilayer fashion

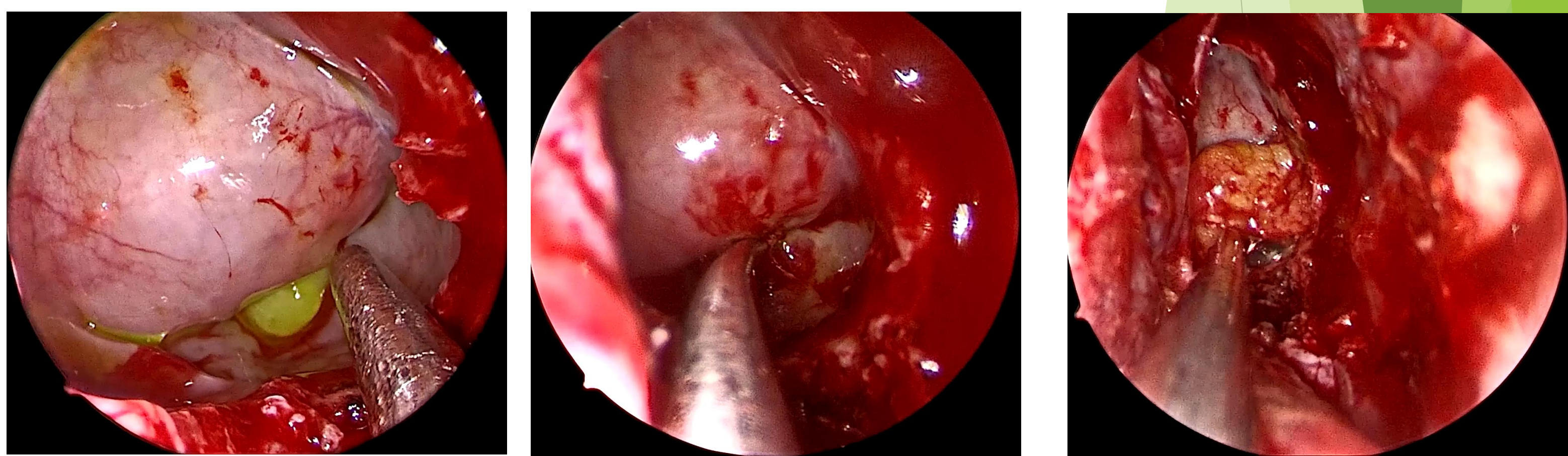


Figure 5: Small infrasellar meningocele, reconstructed in multilayer fashion

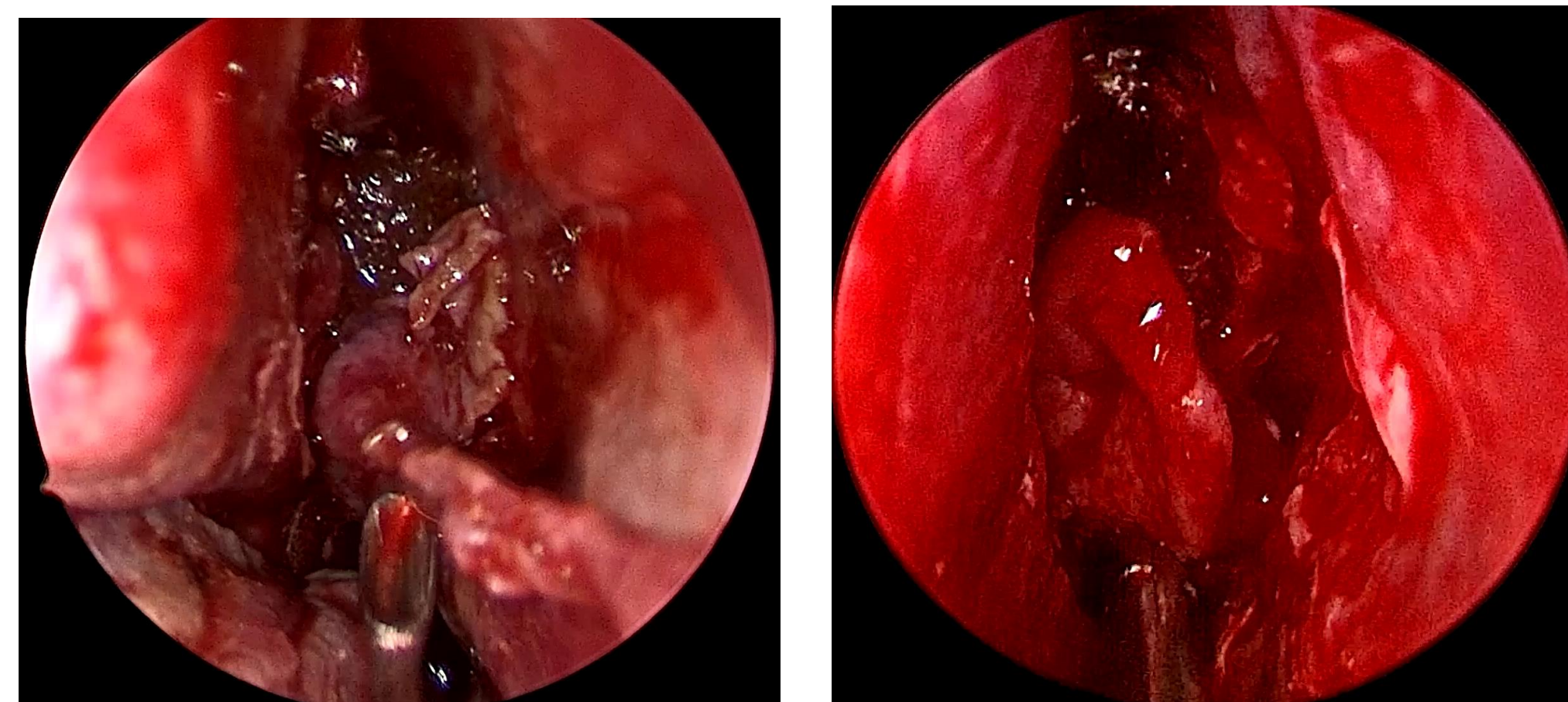


figure 6: examples of other layers used in multilayer reconstruction.
A: posterior septal localized flap. B: middle turbinate flap



Mohamed Elkahwagi, MD
Mansoura university, Egypt
mohamedelkahwagi@mans.edu.eg

