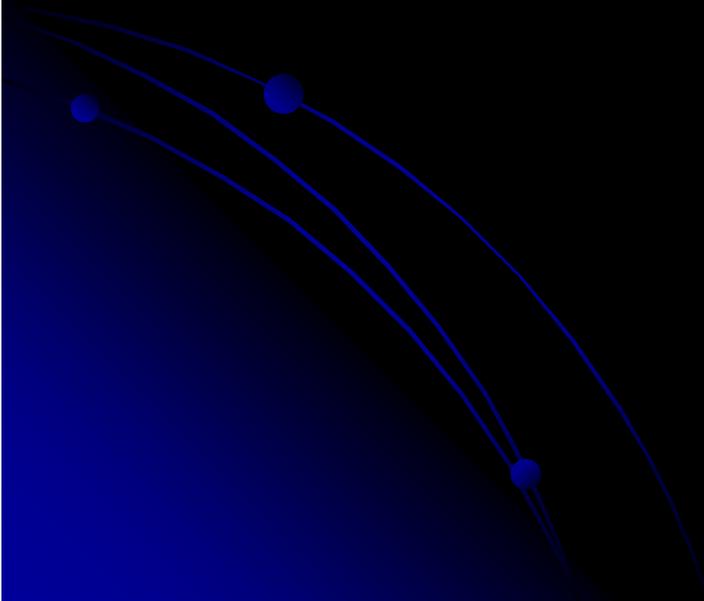




**INTRACRANIAL SUPPURATION, ENT AND
THE NEUROSURGEON**

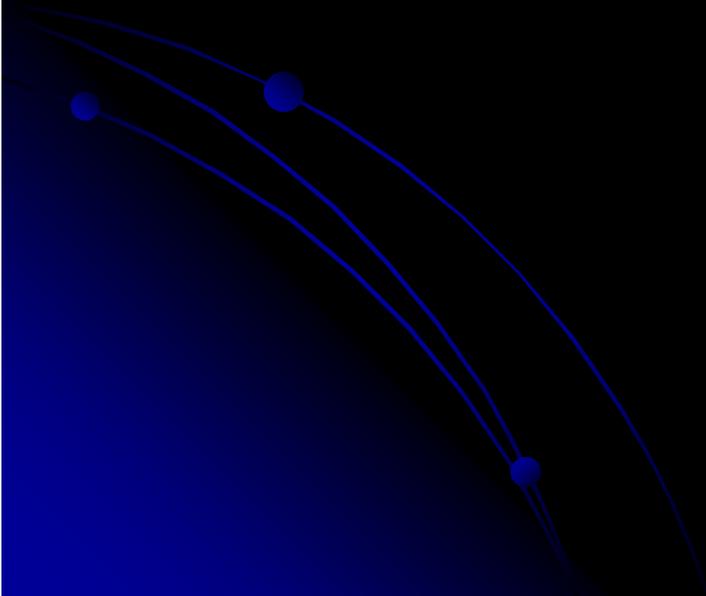
Dr H. BOODHOO
F.C.S
Consultant Neurosurgeon

PATIENT 1



PATIENT PROFILE

8 yrs old male



HISTORY

- **Fever**
 - **Headache**
 - **Neck stiffness (day 3)**
- 

ON EXAMINATION

General physical examination

- Sick looking
- Extremely thin
- Unusually quiet
- Wt. 16kgs
- P: 92/min T/°C: 37.6 RR: 14/min
- ENT: nasal secretions ++ rt.>lt.

On Examination (cont)

Systemic examination

- **CVS**
- **Chest**
- **GIT**



Normal

On Examination (cont)

CNS examination

- GCS: E₄M₅V₆
- Normal Higher mental function
- Mild neck stiffness
- No cerebellar signs
- Cranial nerve examination: normal
- Fundoscopy: no papilledema

CT BRAIN (contrast)

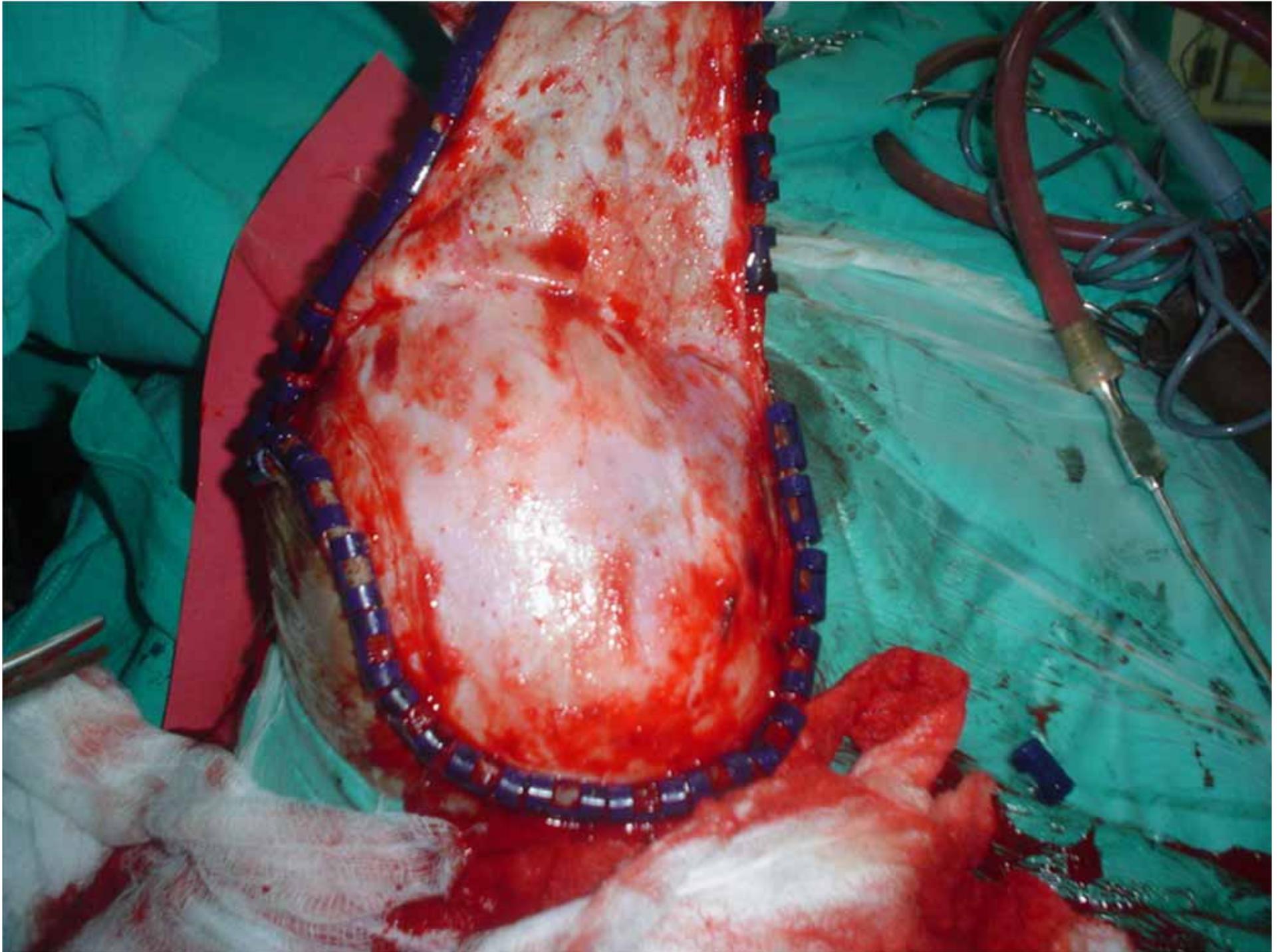
- Pansinusitis
 - Right frontal brain abscess
 - Right fronto temporo parietal subdural empyema
 - Referred urgently to neurosurgical unit, Victoria Hospital
- 

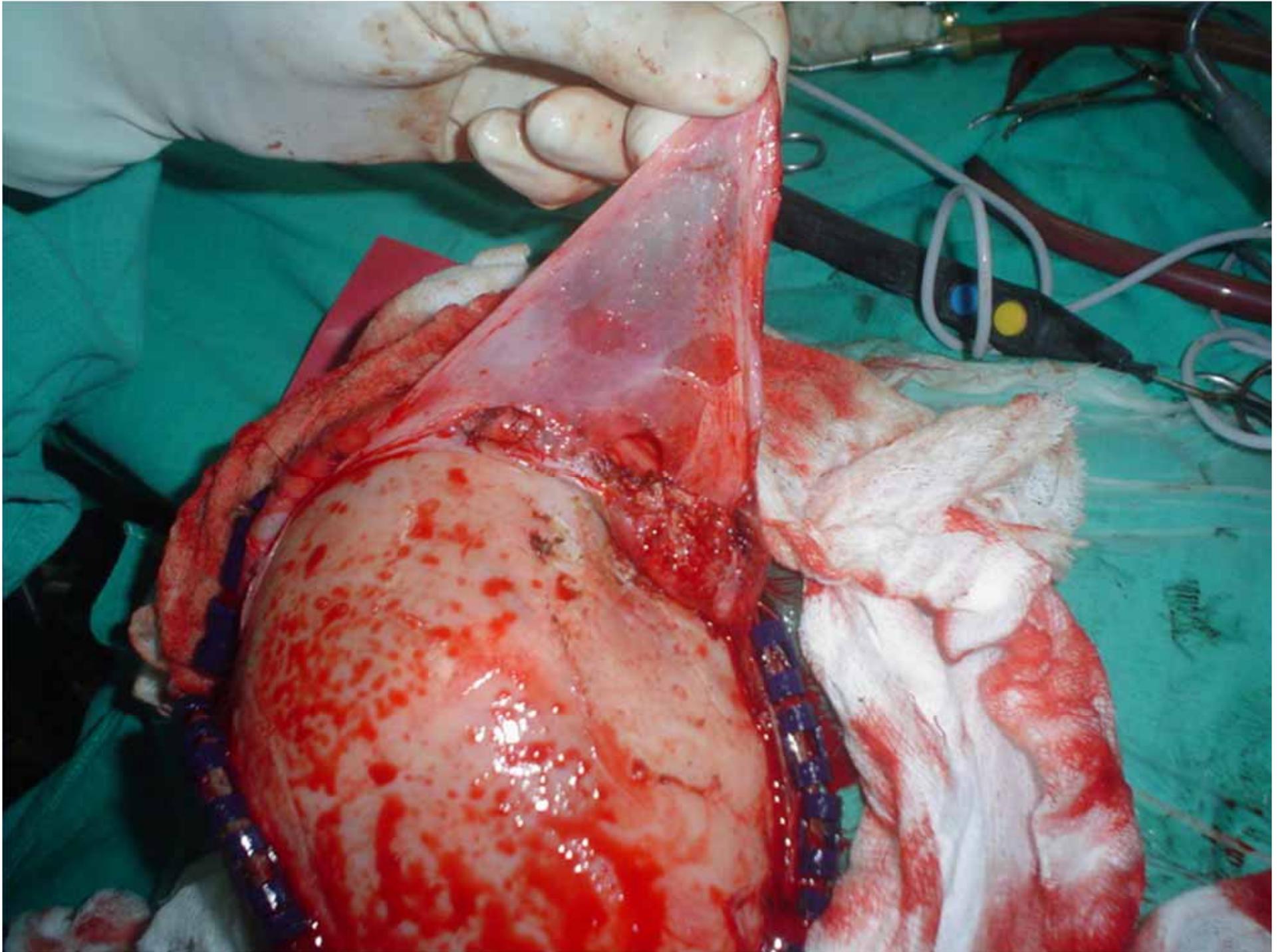
MANAGEMENT

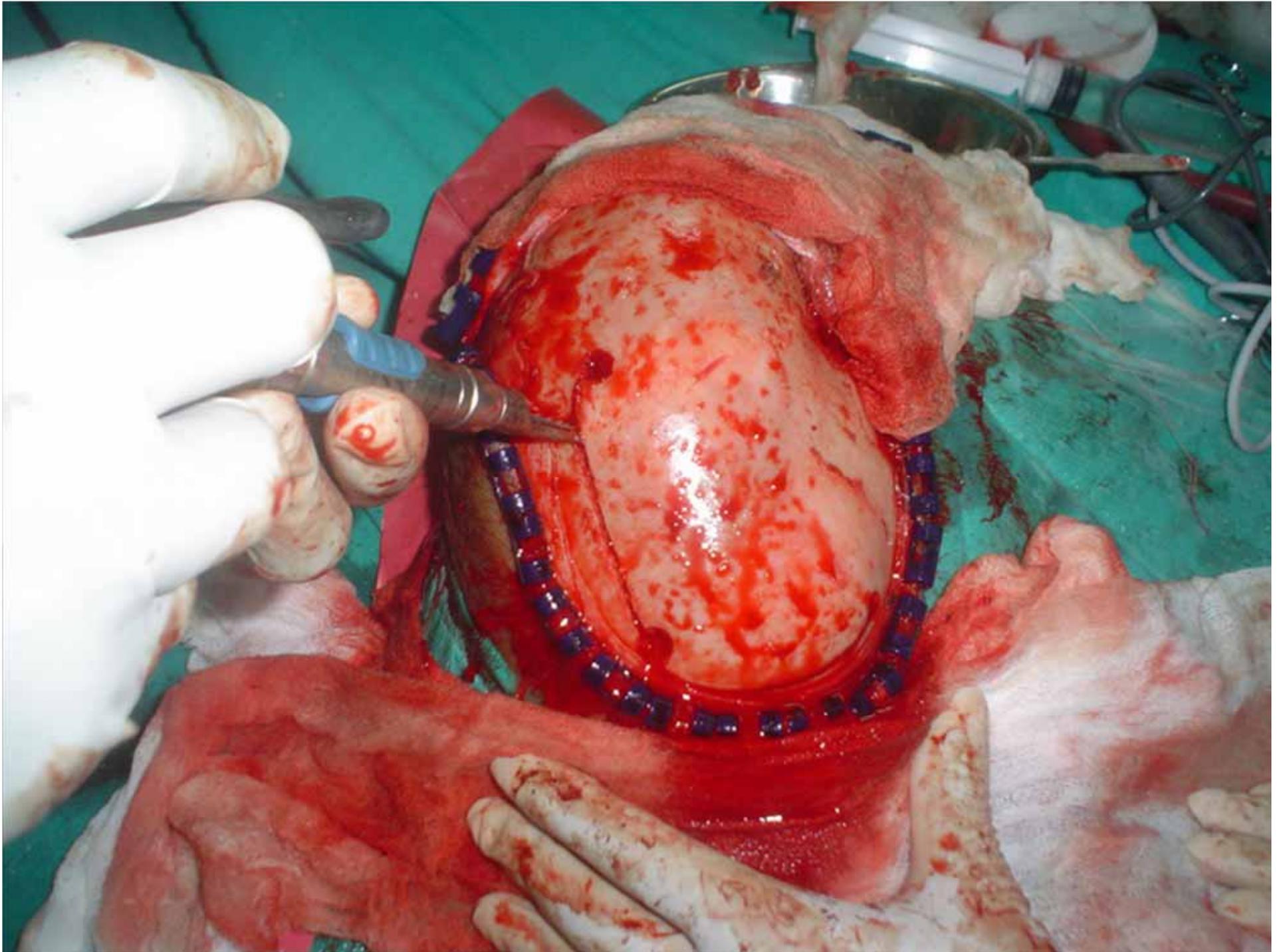
- Admitted
 - IV antibiotic therapy
 - Urgent referral to E.N.T Hospital
 - BAWO- Pus +++ right maxillary sinus
 - Back to VH next day
- 

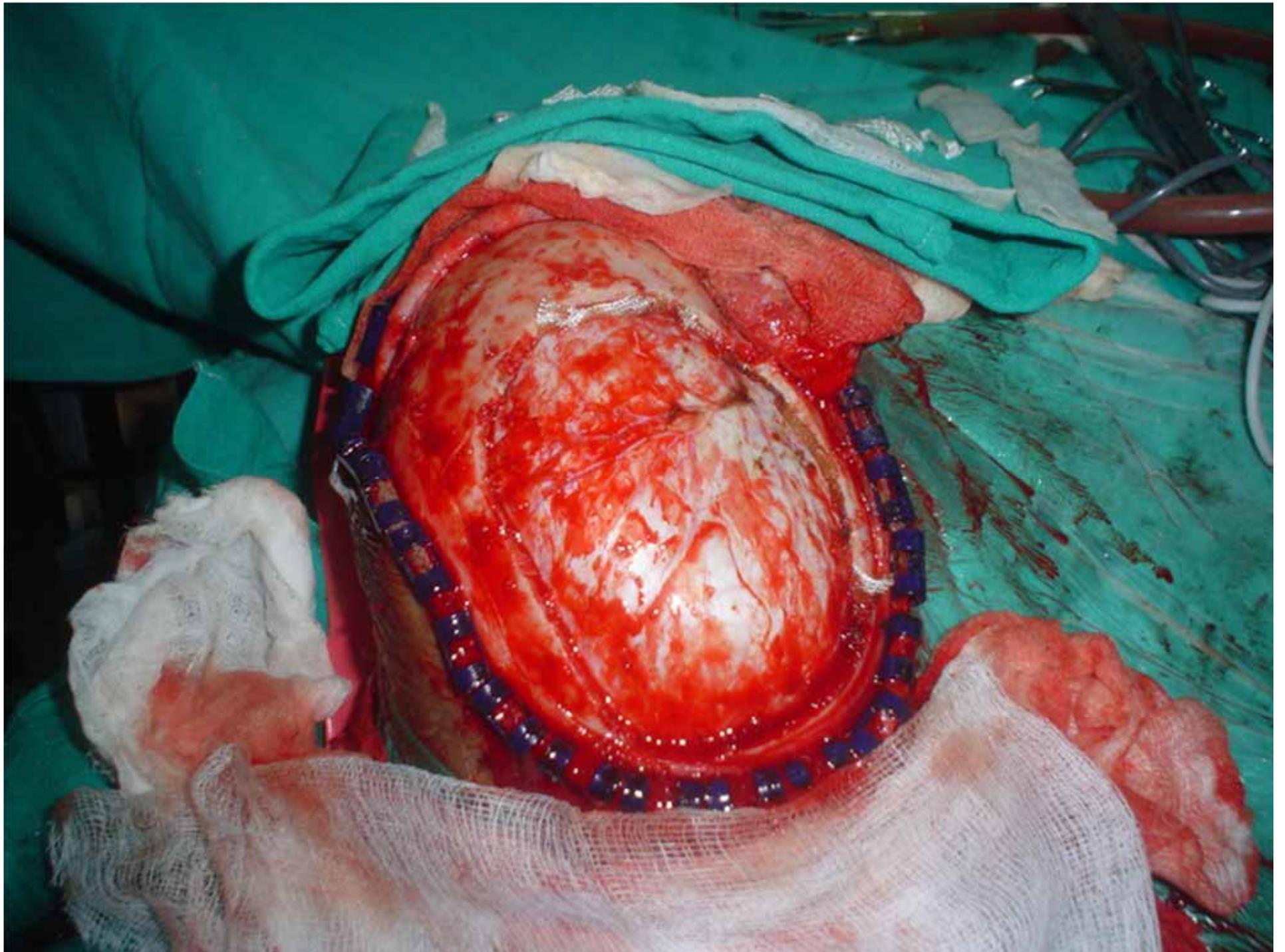
MANAGEMENT (cont)

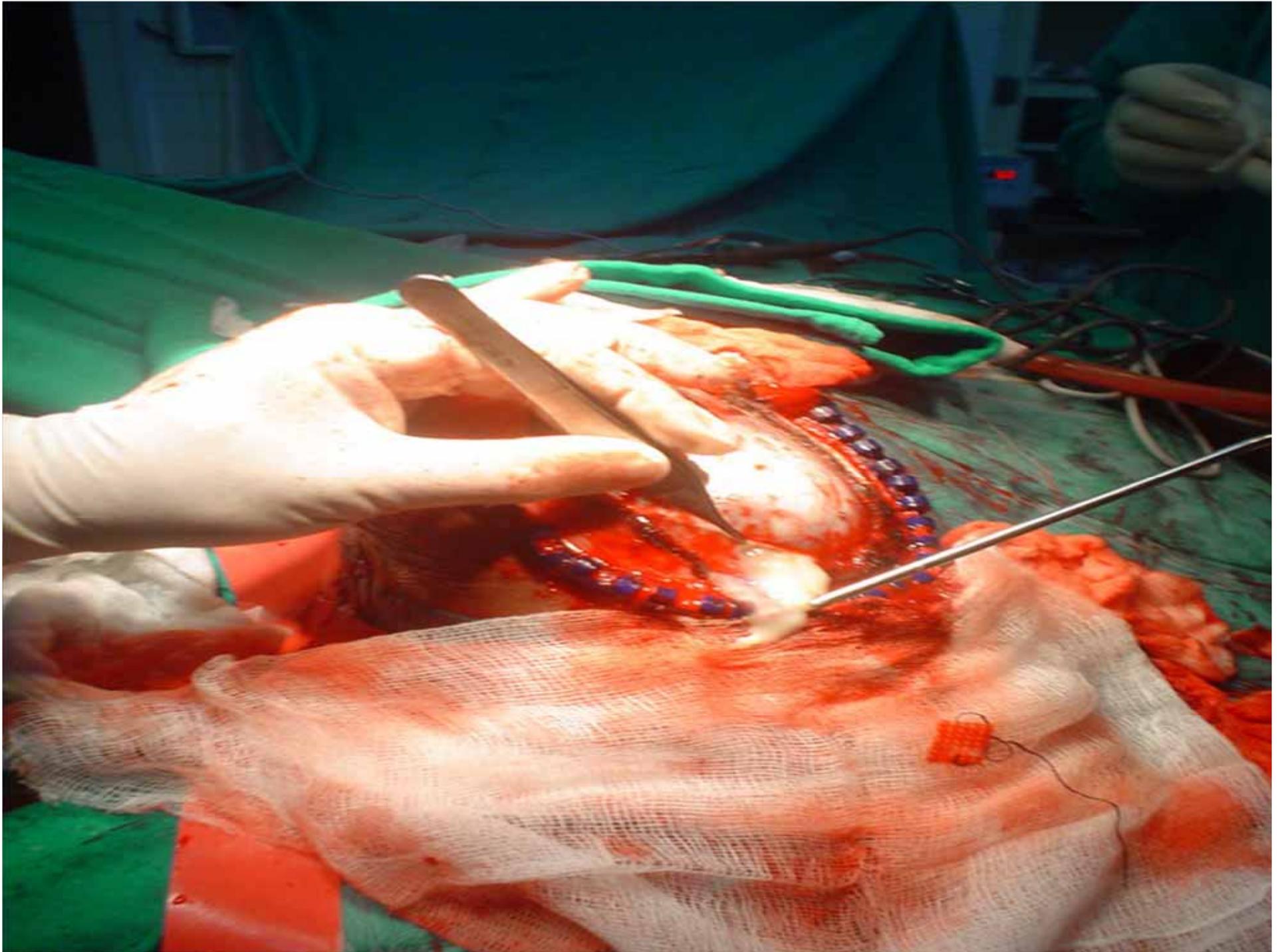
- 25/06/08: Cranial surgery
 1. Right small frontal craniotomy for drainage of brain abscess
 2. Wide temporoparietal craniotomy for evacuation of subdural empyema
- Nursed in ICU
- IV antibiotics/ antiepileptic

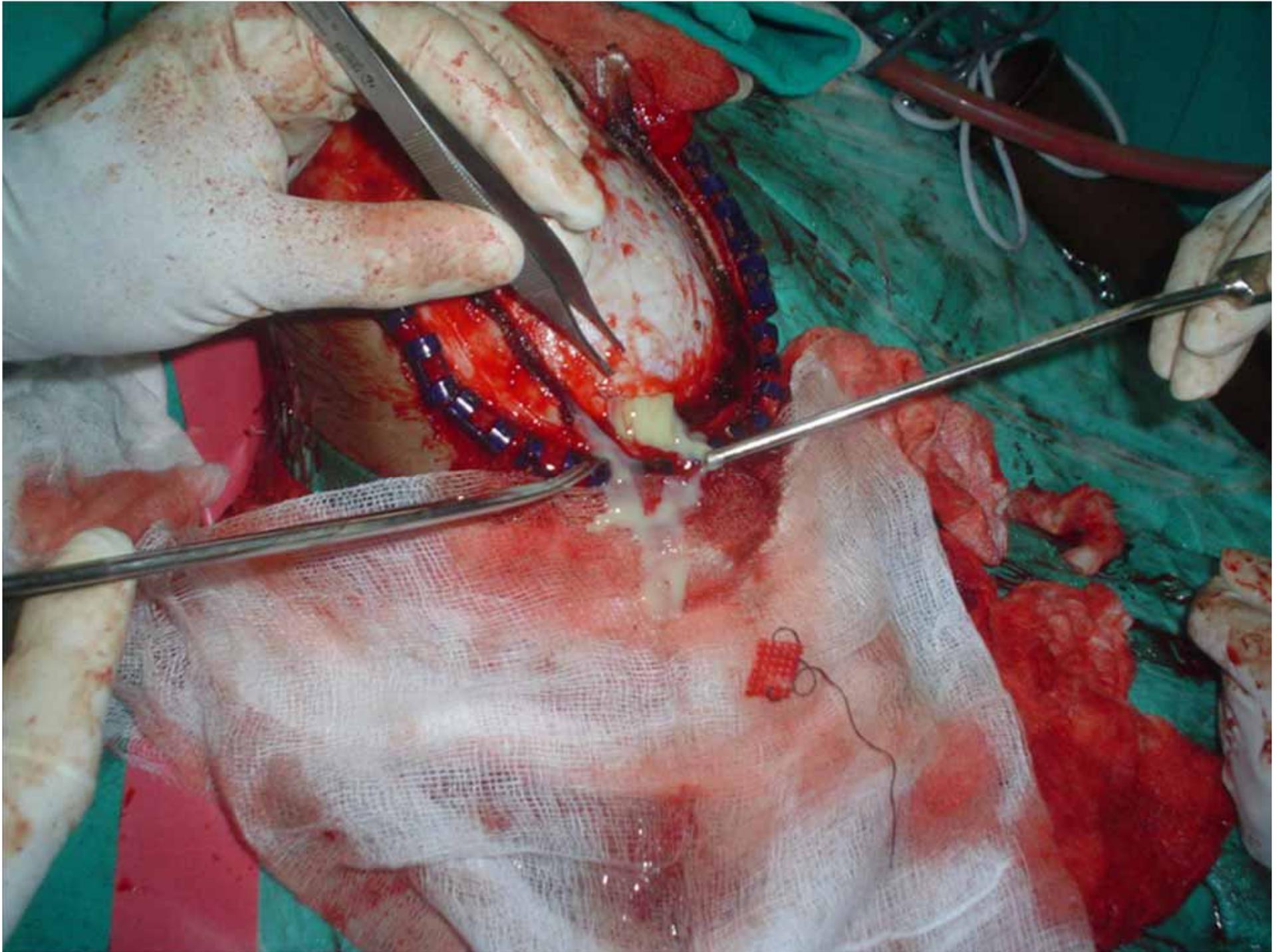


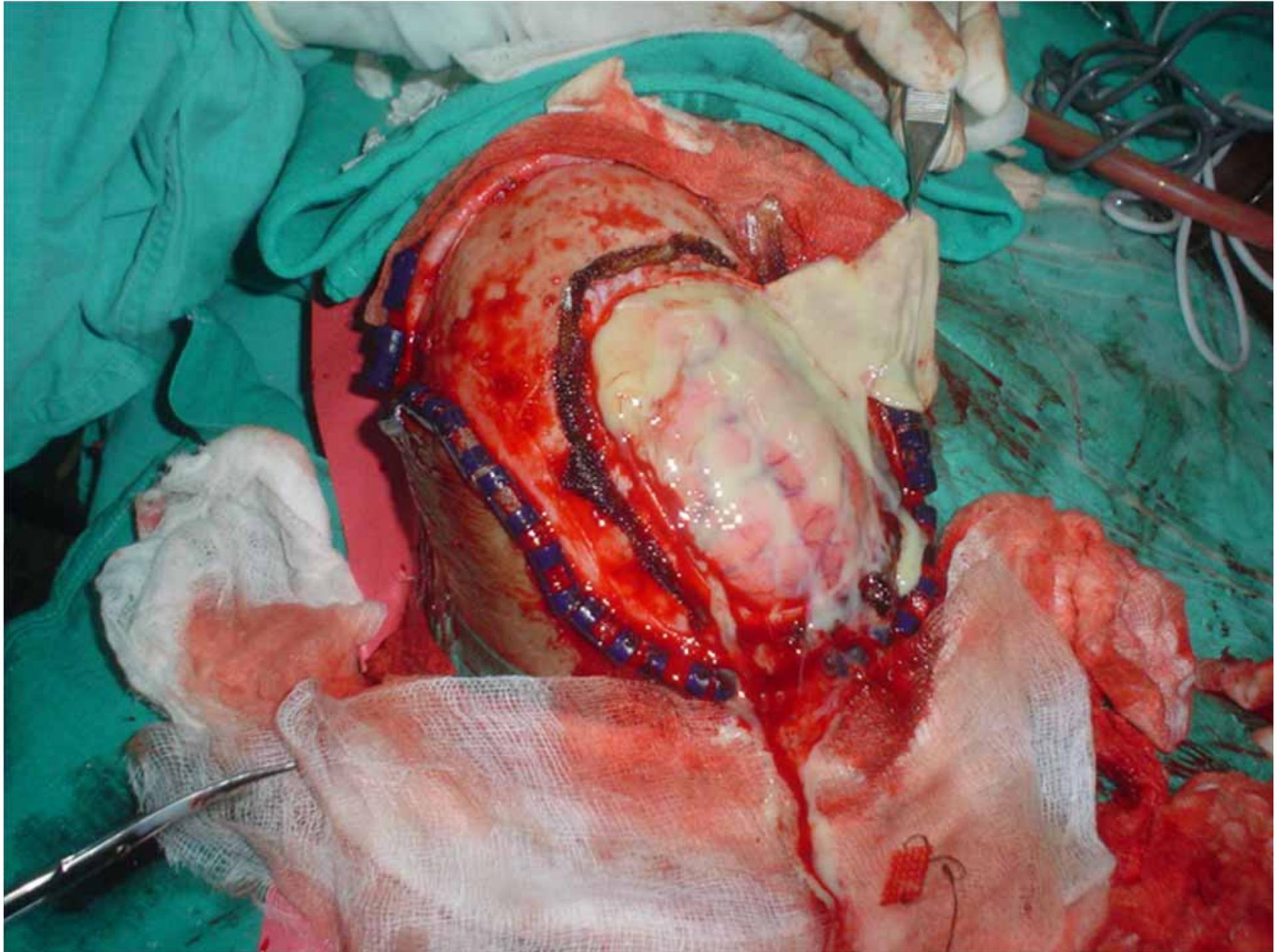


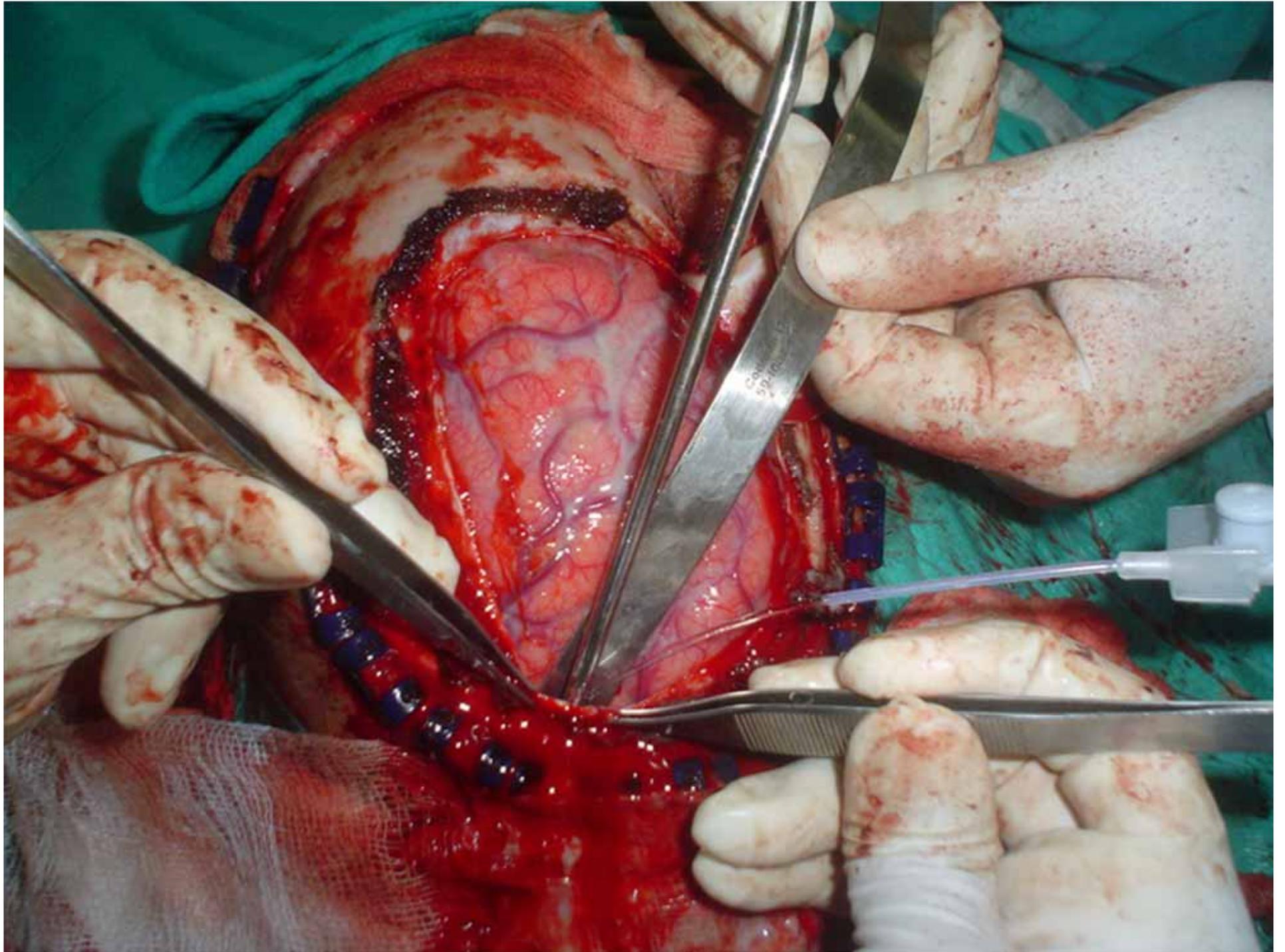


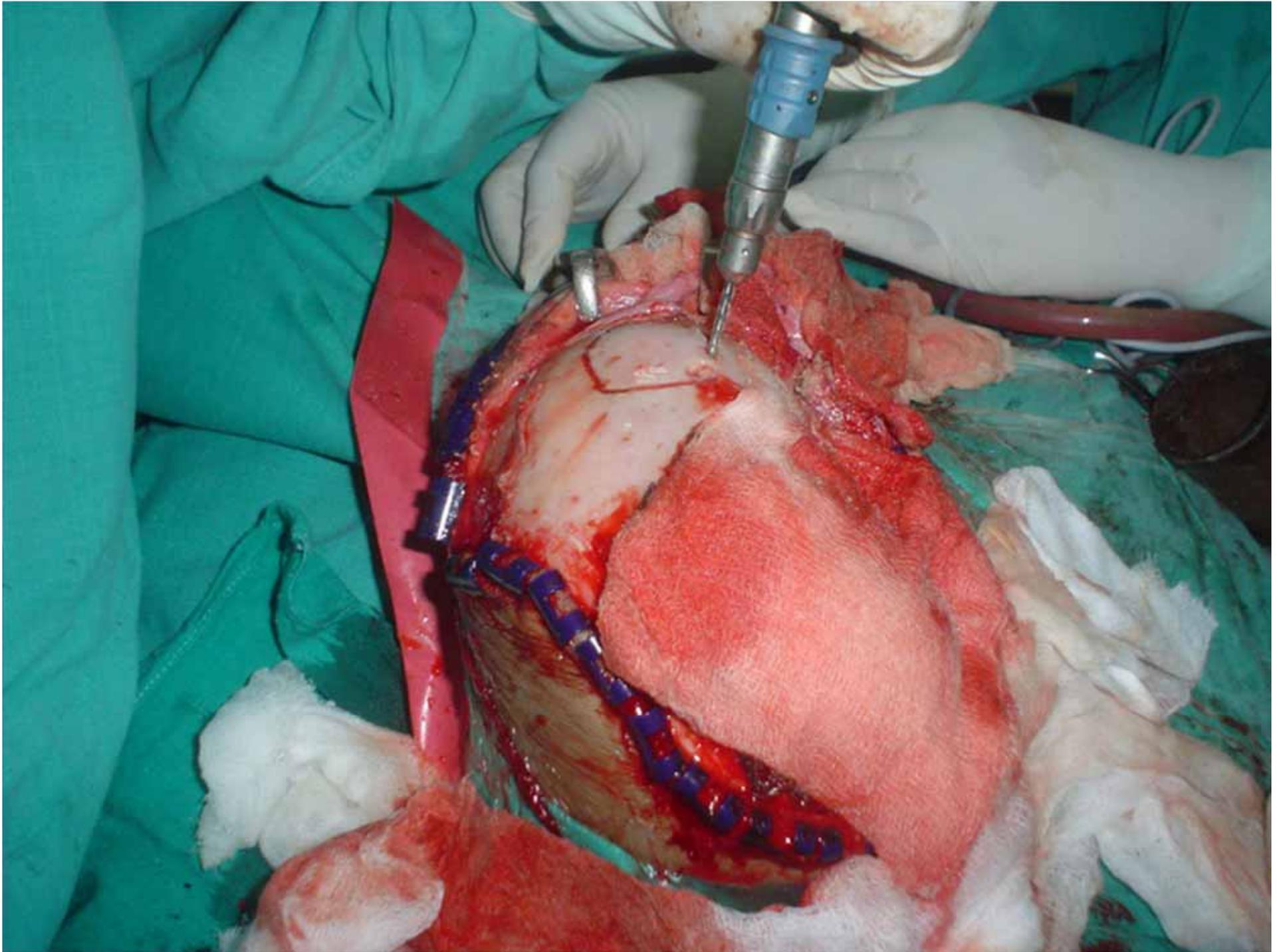


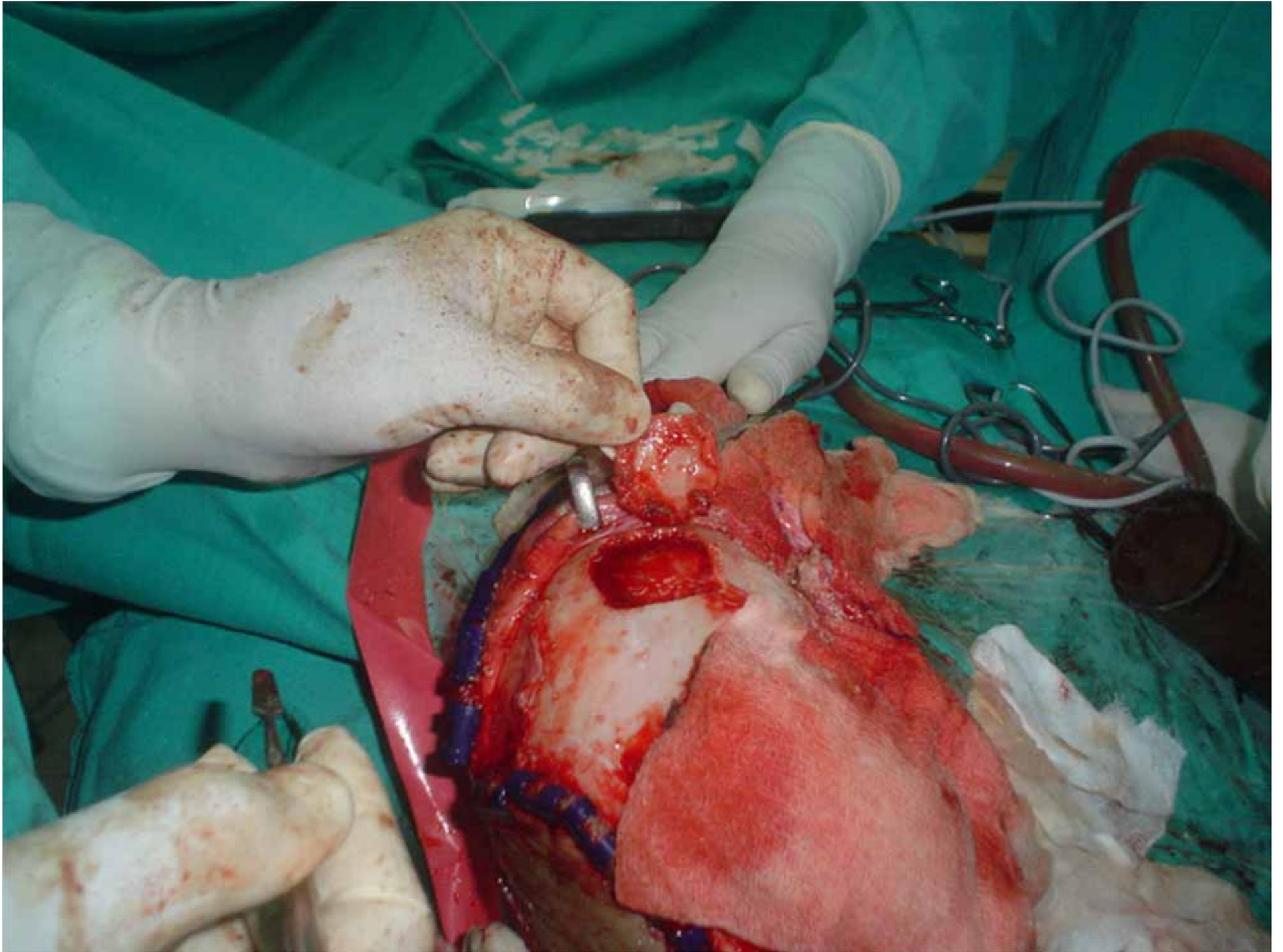


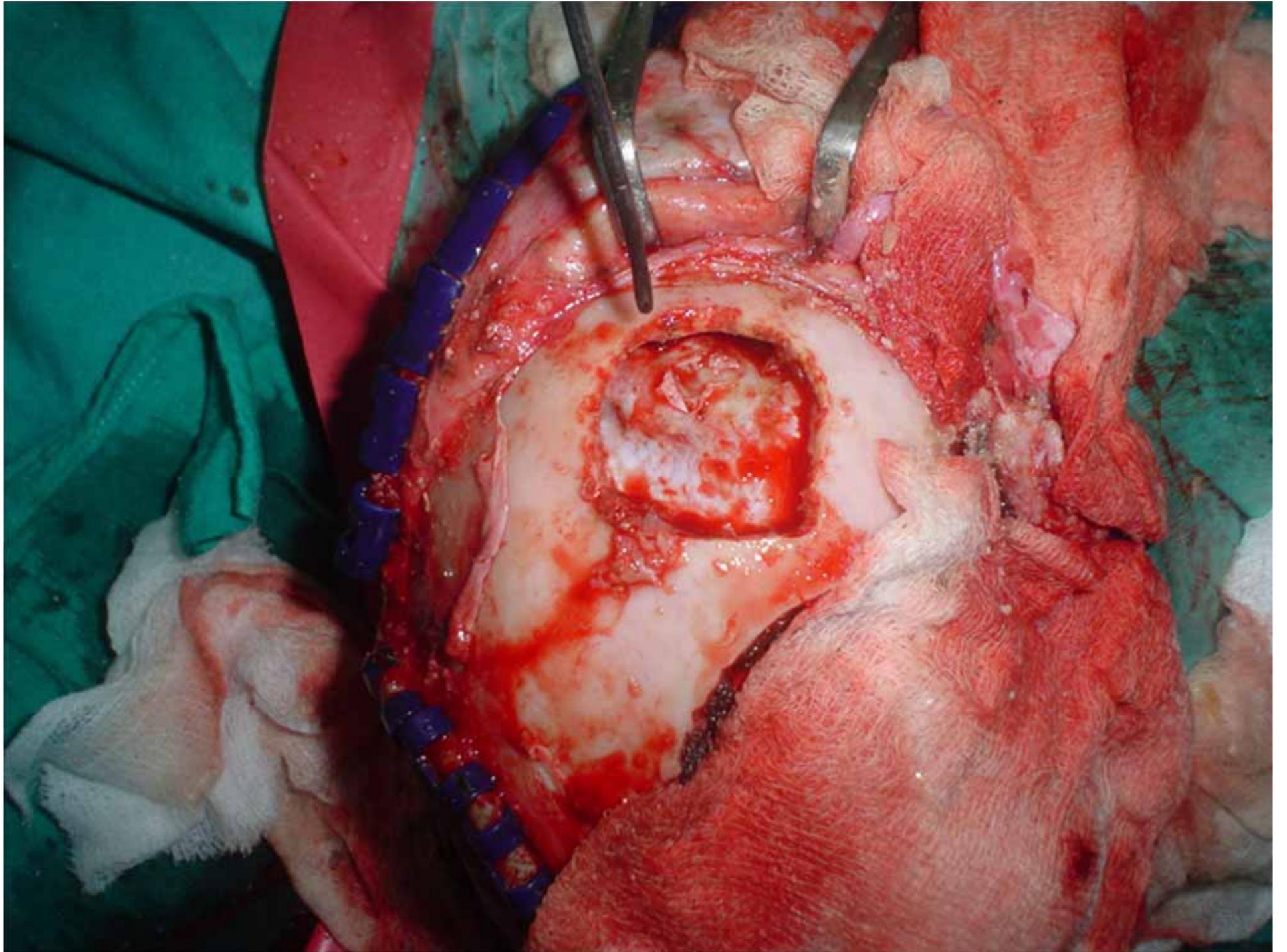


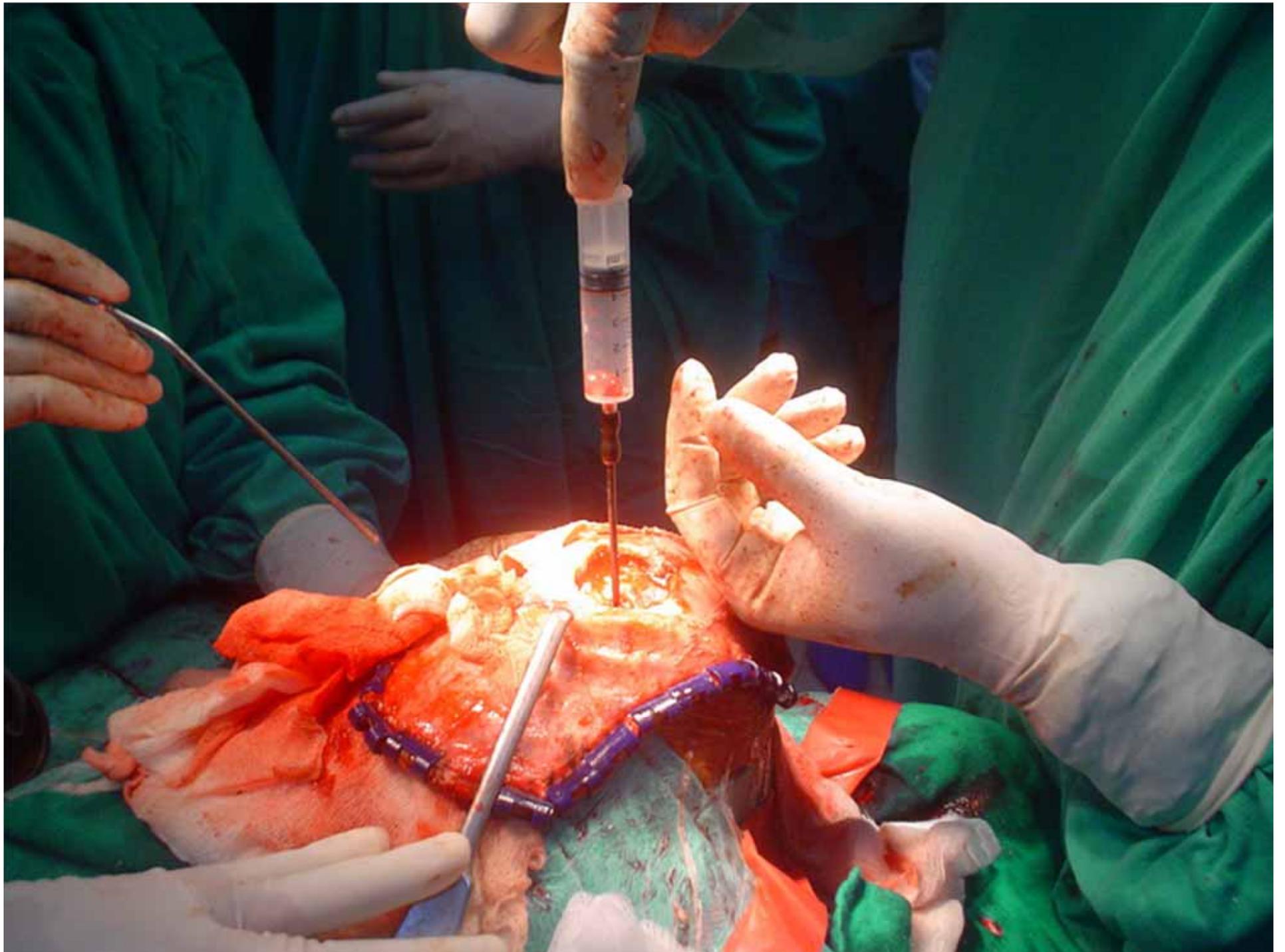


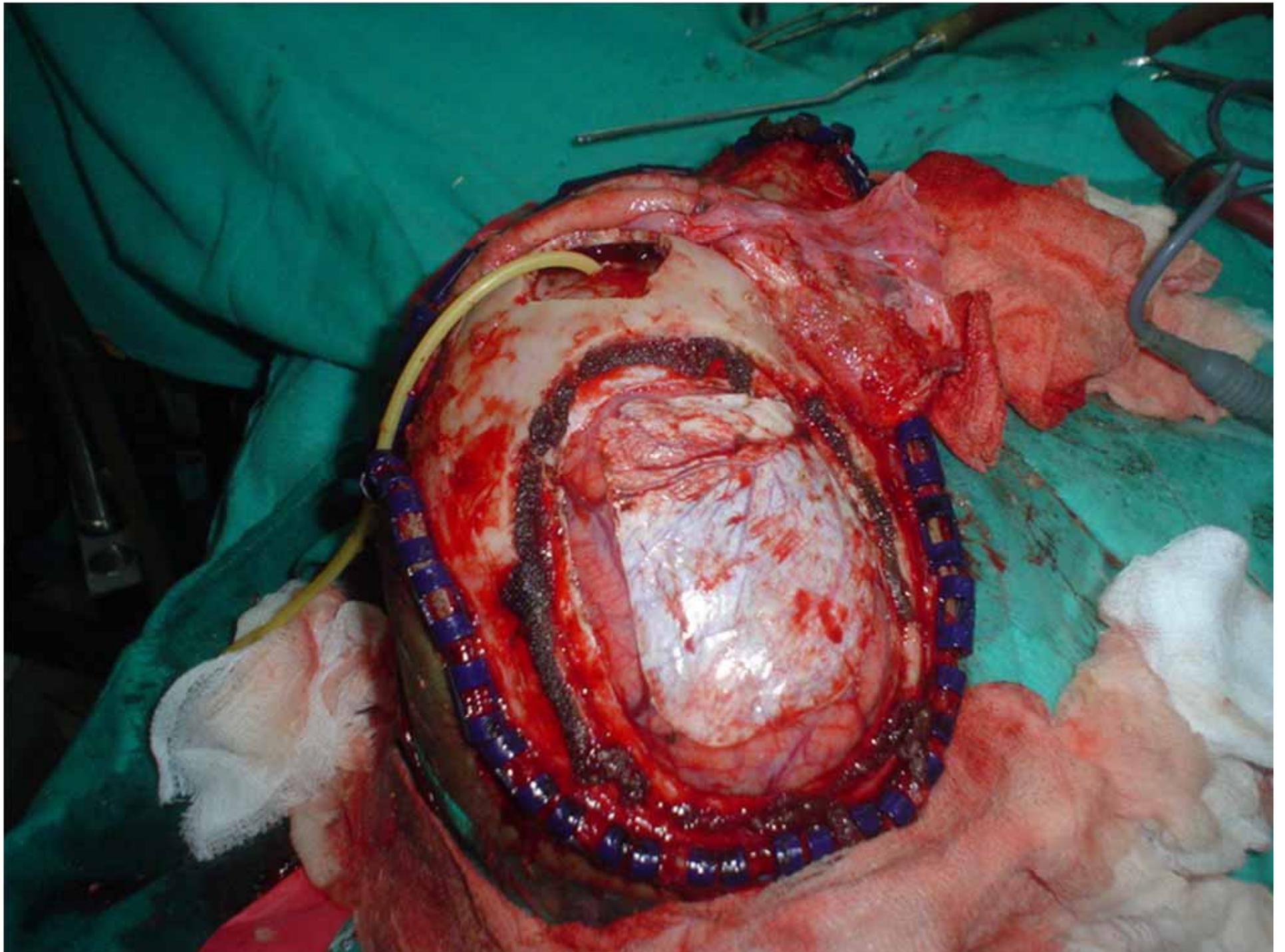


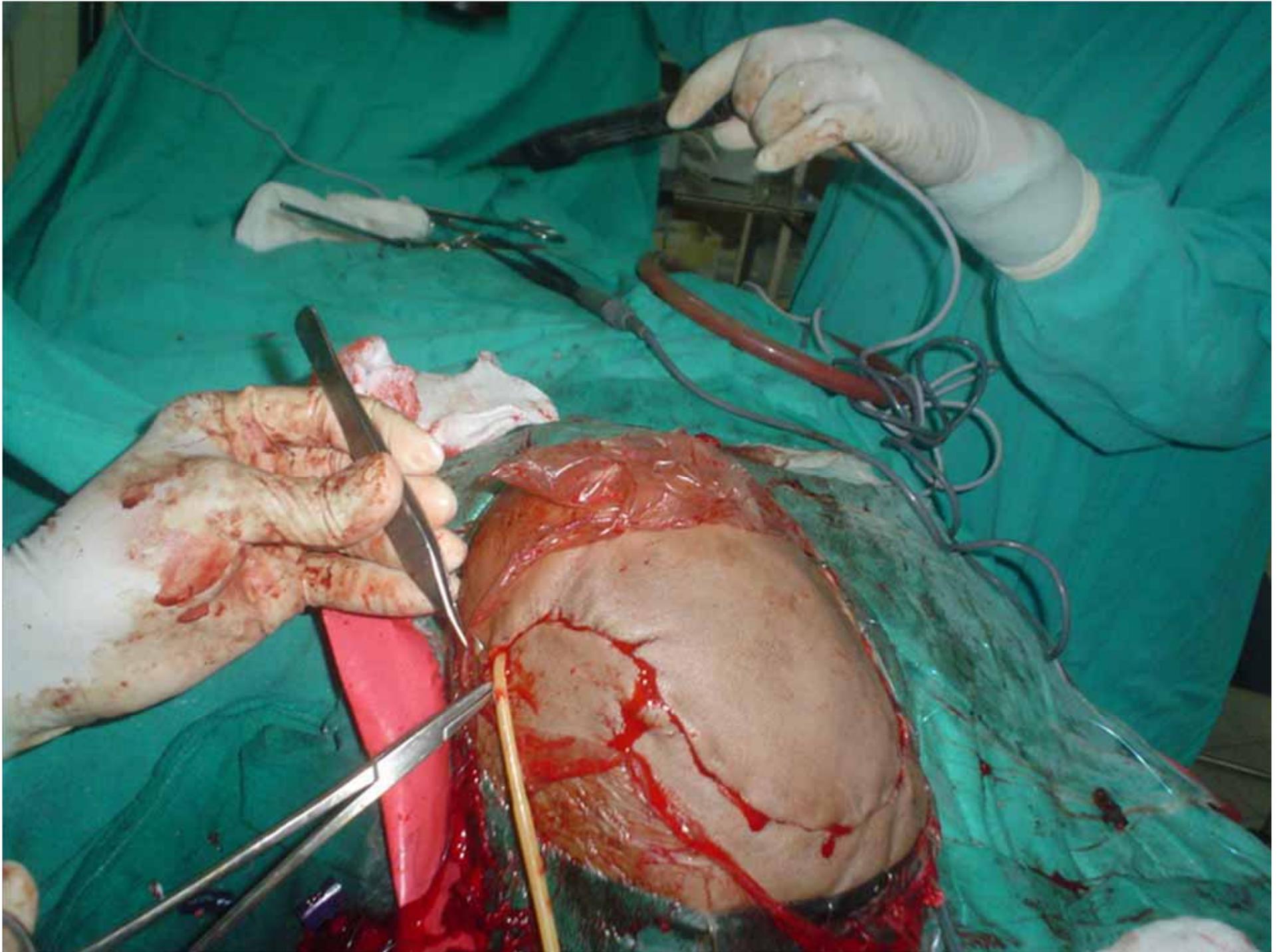












POST-OP

- Marked improvement in clinical condition
- Uncomplicated recovery phase
- Lab culture report: sterile
- Referred to nutritionist- high protein diet
- Progress CT brain showed good evacuation of brain abscess & empyema, no features of infarct or ↑ ICP
- Continued on IV antibiotics for two weeks

Patient 2

- 16 years old Male
- Comores Island
- c/o Chronic discharge Left ear (untreated)
- Headache, confusion, fever
- GCS10/15 (E3M5V2)
- Spastic, neck stiffness

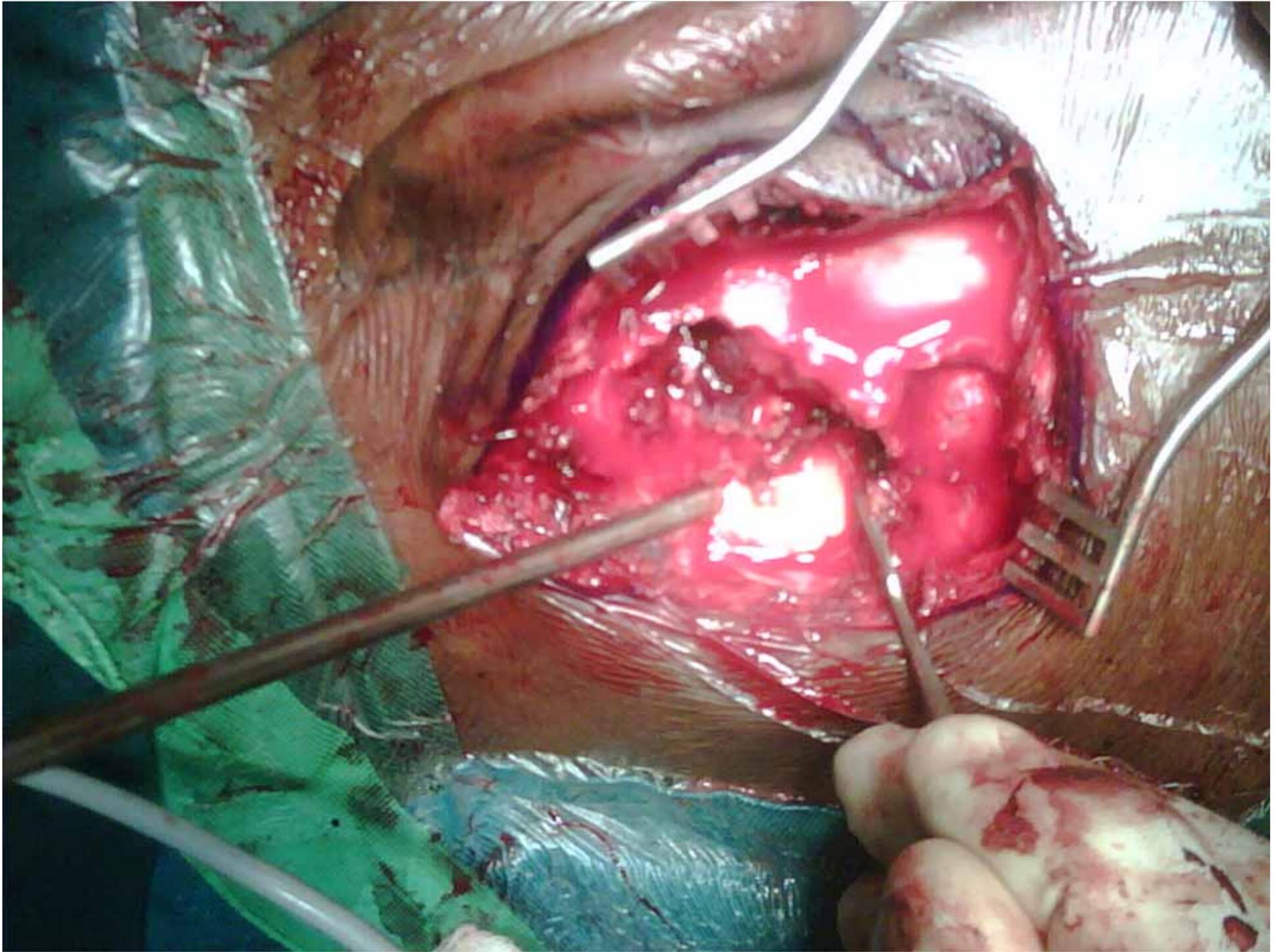
- **Emergency combined surgical treatment**

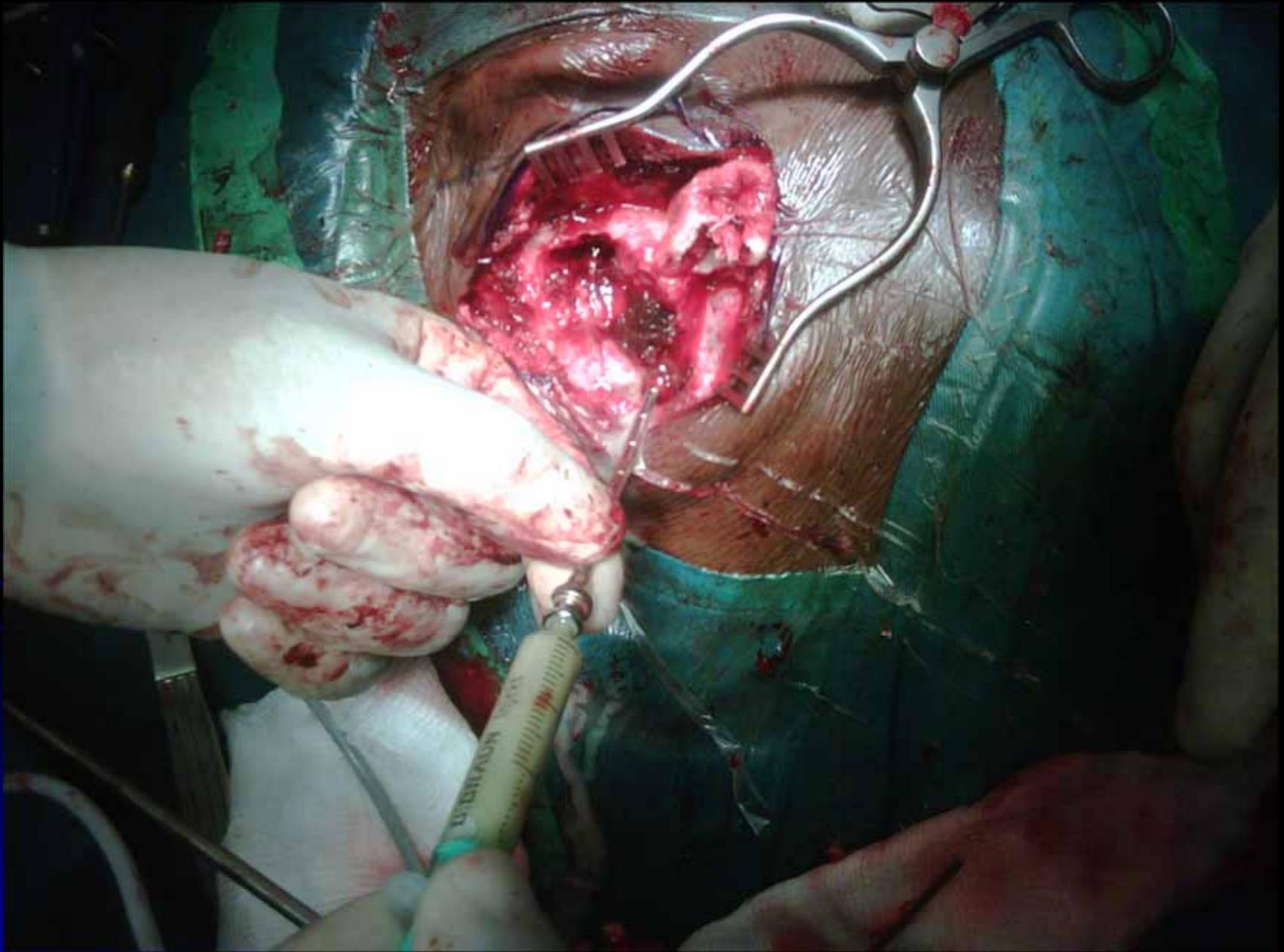
- **Radical mastoidectomy and posterior fossa craniectomy**

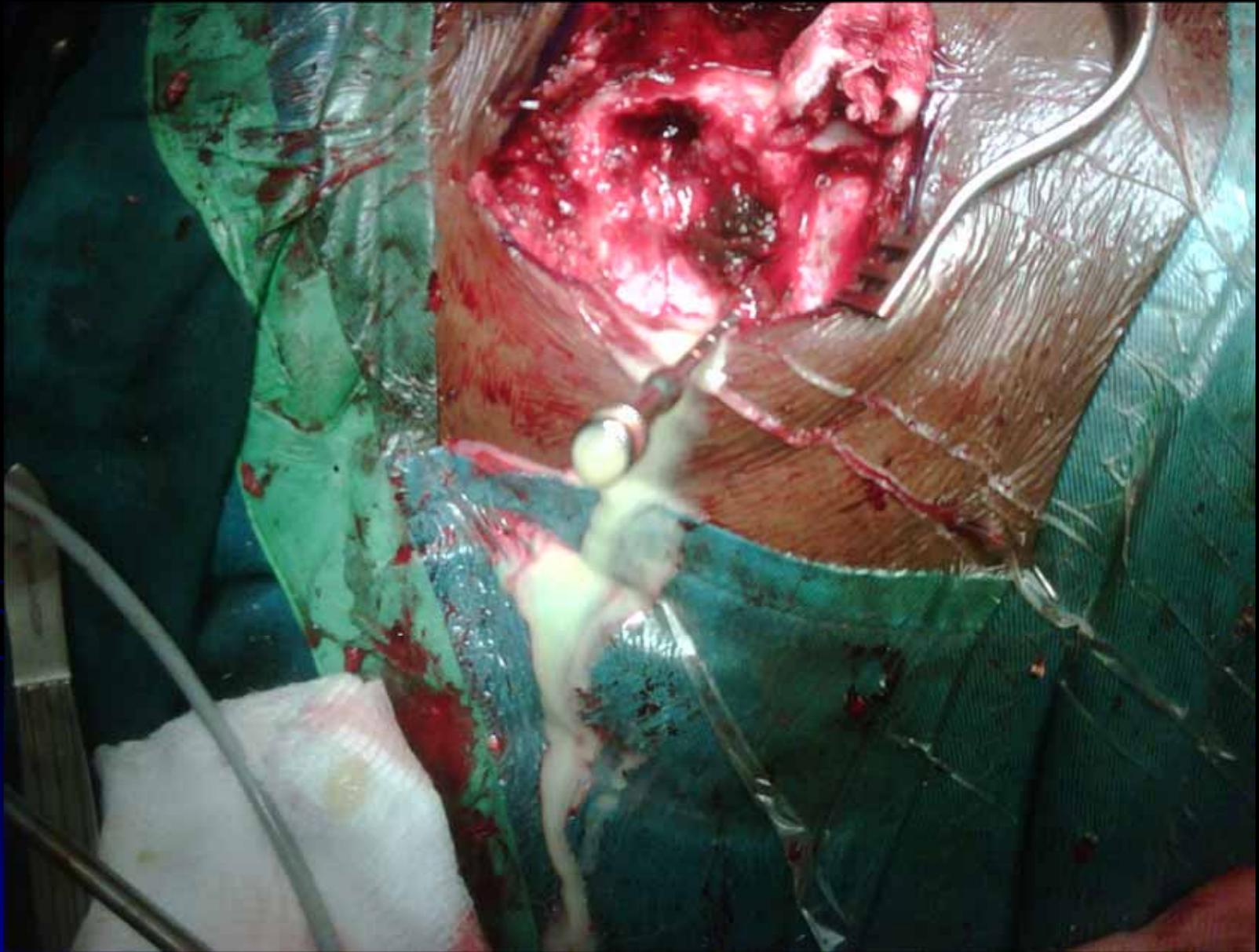


EAR









PATIENT 3

Case 3

Patient profile

- **NAME** : A.K
- **AGE/SEX** : 20 years/male
- **OCCUPATION** : University student
- **D.O.A** : ENT- 20/05/10
VH - 21/05/10

AT ENT hospital

- C/o swelling with boil over the nose
- Signed DAMA on antibiotics

- Attended ENT Hospital with headache
- Increased swelling and redness over nose
- Patient admitted and put on I.V antibiotics- amoxyl, cloxacillin

URGENT TRANSFER TO VH

- Next morning, altered level of consciousness with severe head ache
- Urgent referral to VH the same day for CT scan brain

GENERAL PHYSICAL EXAMINATION

- GCS – E (closed) M5 V3
- Neck stiffness
- Proptosis right eye

- One furuncle over nasal tip with swelling
- Redness over nose with burst boil over tip of nose

- Bilateral periorbital edema
- Mild proptosis right eye
- Chemosis B/L eyes

Systemic Examination

- CVS

- R/S

- GIT

} within normal limits

SYSTEMIC EXAMINATION(contd)

- CNS examination:

GCS - E5 M5 V3

Asymmetry of face

Multiple cranial nerves palsy

(3rd , 4th , 6th and lower cranial nerves)

INVESTIGATION

- URGENT CT SCAN REPORT OF BRAIN+PNS(CONTRAST)
- Evidence of left cavernous sinus thrombosis with generalised brain edema
- Mild proptosis left eye

MANAGEMENT

- ICU admission in VH
- Anticoagulants - HEPARIN
- IV antibiotics- AMIKACIN, VANCOMYCIN
- MANNITOL
- Ventilation

- Deterioration of general condition
- Drop in GCS
- Urgent CT scan brain repeated

CT scan brain report

- Infarct both cerebellar lobes, brainstem, thalamus
- Cerebral edema

MANAGEMENT

- Maximum therapeutic treatment
- Medical therapy continued
- Coagulation profile monitored daily

COMPLICATIONS

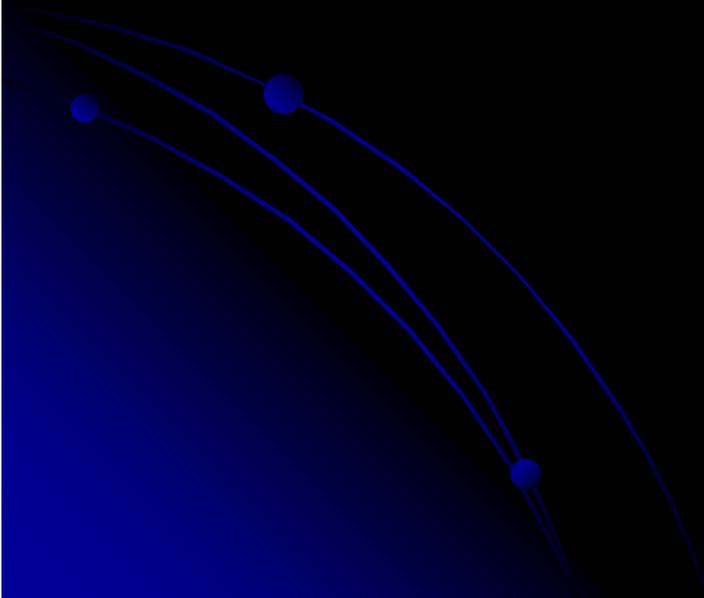
- GIT bleeding
- Hypernatremia
- Polyuria

Diabetes insipidus

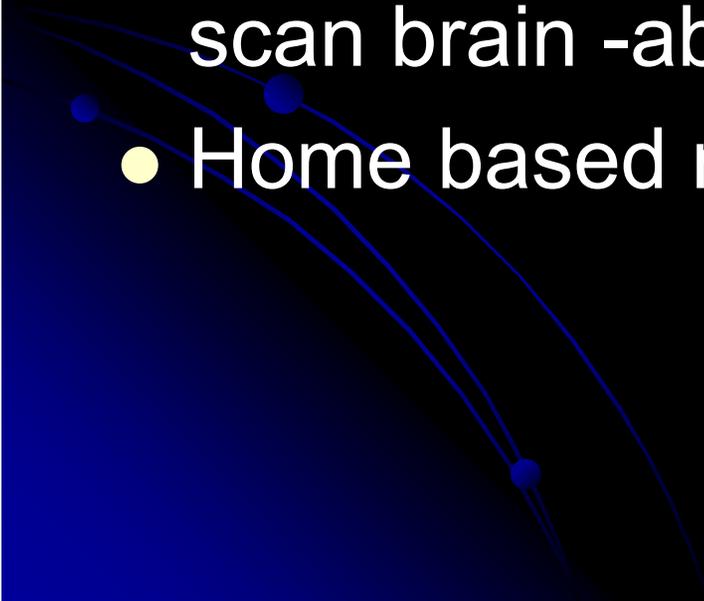
- Condition further deteriorated
- Both pupils dilated and unreactive
- Brainstem dysfunction – absent gag and corneal reflex
- Date of death : 26/05/10

Patient 4

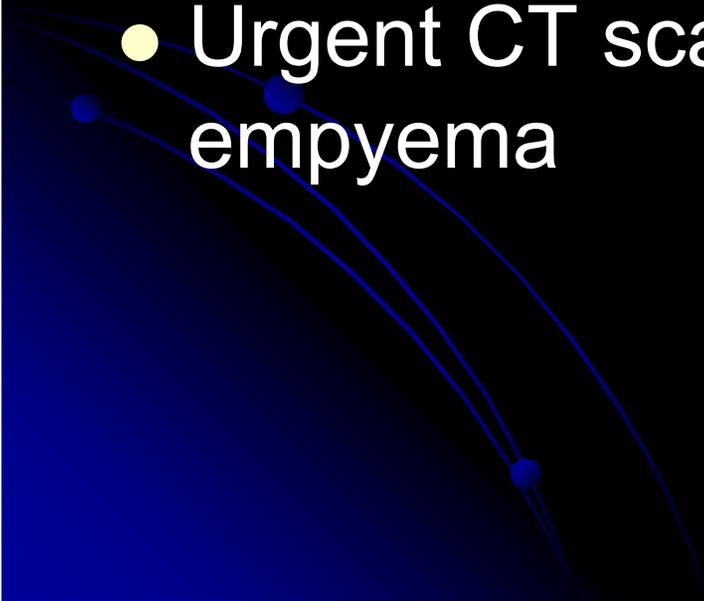
- Male, 27 yrs
- Serious dental carries
- Headache
- Visual deterioration



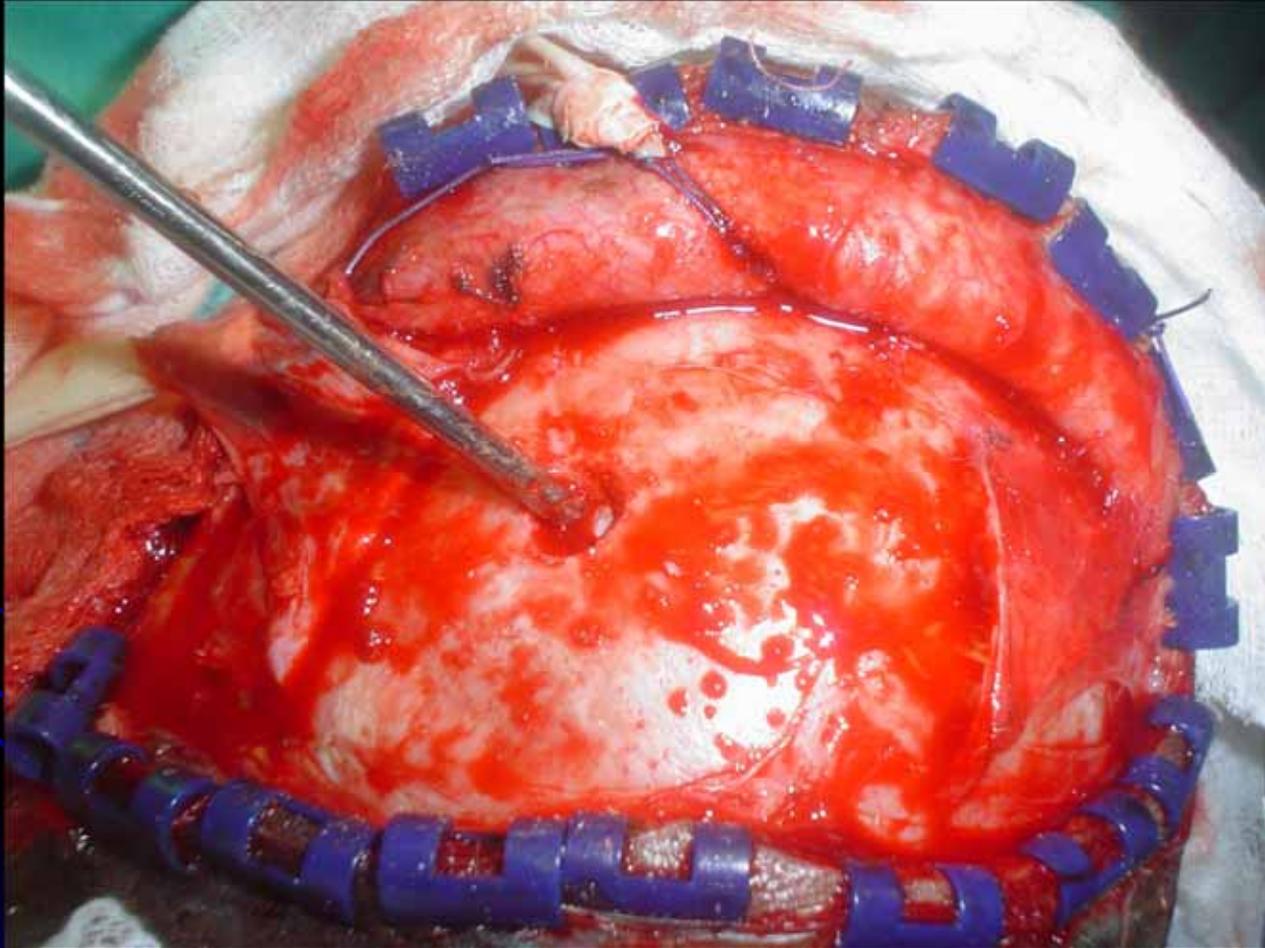
- HIV negative
- Tooth extraction
- IV antibiotics
- Cardiac murmur (one week later)
- Cardiac echo-Severe vegetation on valve
- Blood culture- *Strep melleri*

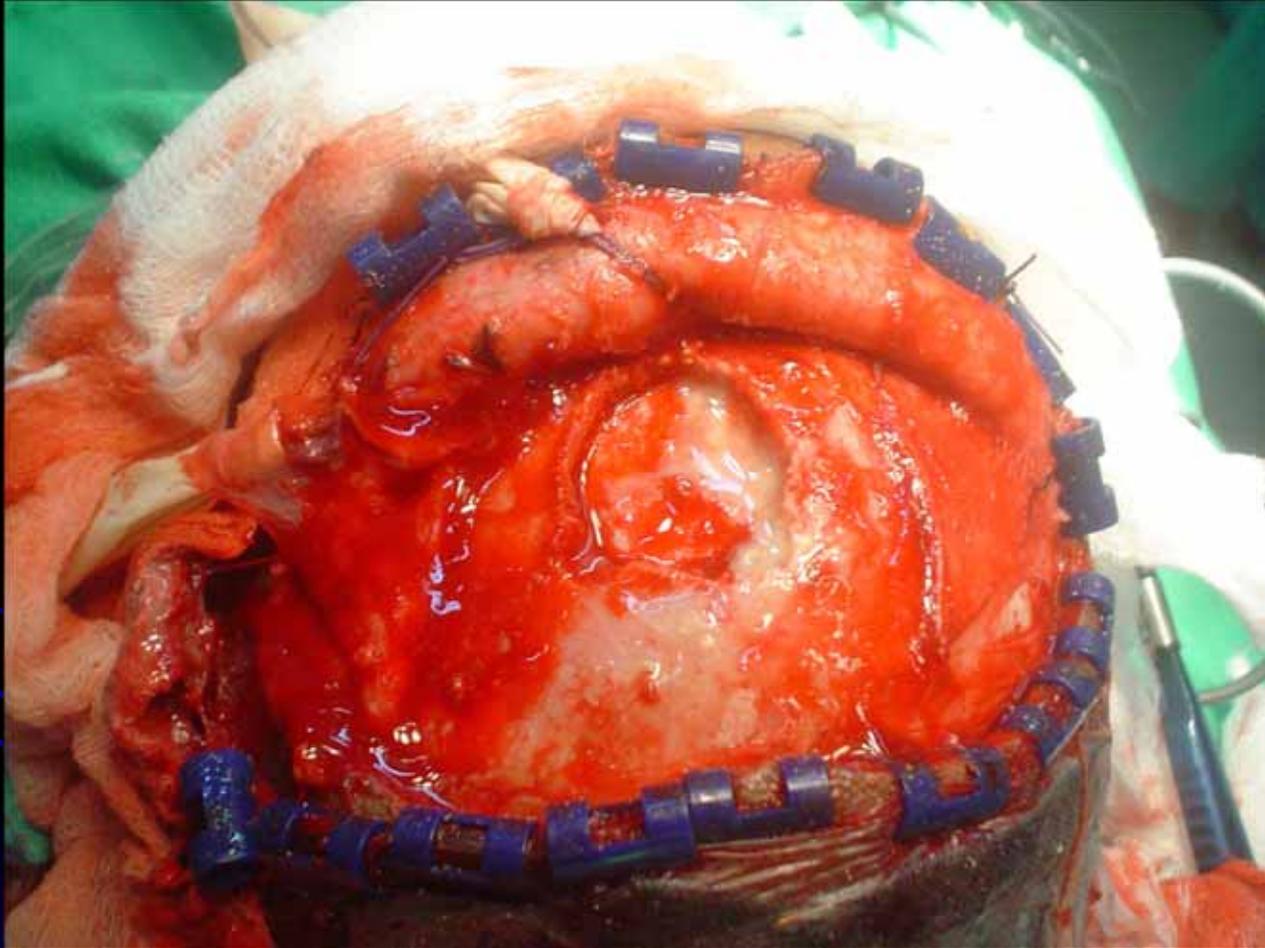
- Long term stay in hospital
 - Right sided Hemiparesis
 - Seizures
 - Follow up CT scan brain(resolution of CT scan brain -abcesses)
 - Home based rehabilitation
- 

Patient 5

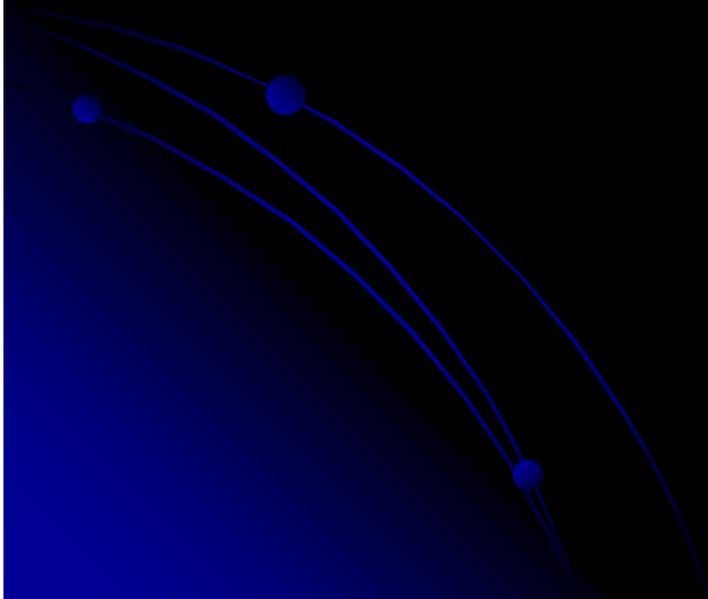
- 13 yr old male patient from ENT treated for Pansinusitis
 - Altered sensorium
 - Persistent headache
 - Urgent CT scan (Left frontal, extradural empyema)
- 







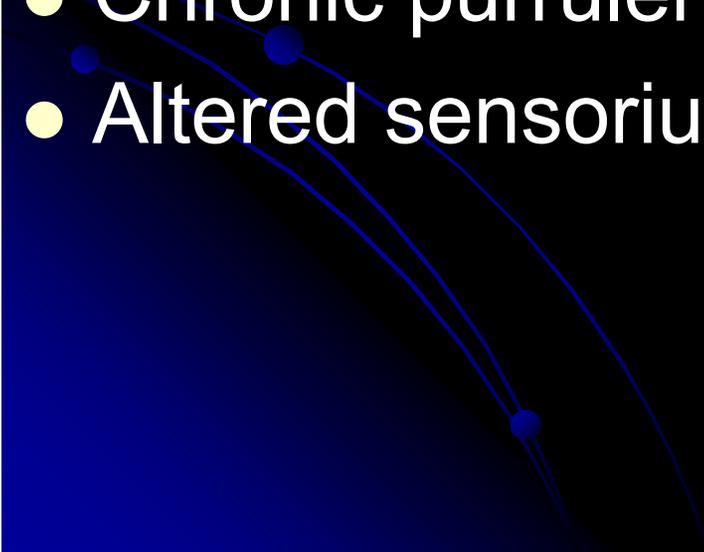
Patient 6



Patient 6

UNCOMMON COMPLICATION OF A COMMON CONDITION

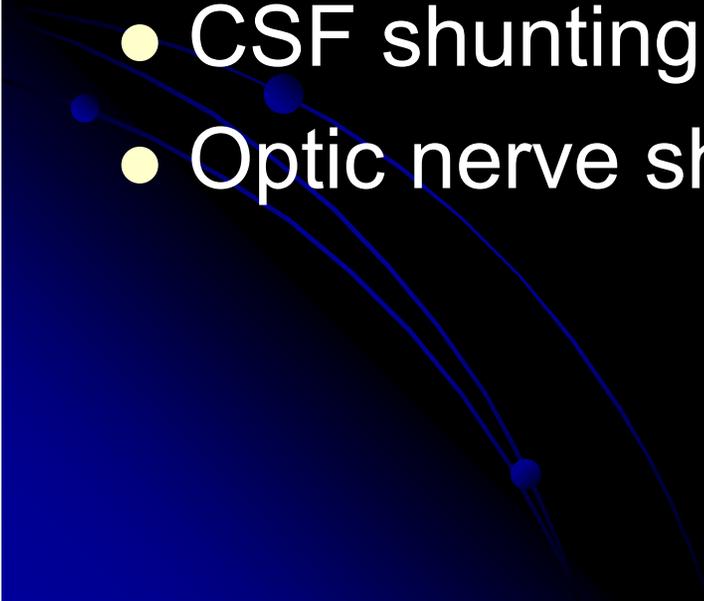
Otitic hydrocephalus

- Male: 40 yrs old
 - Chronic purulent discharge from right ear
 - Altered sensorium
- 

OTITIC HYDROCEPHALUS

- 1931 Symond's
- Acute otitis media with hydrocephalus
- Thrombosis of transverse sinus, superior sagittal sinus
- Hypercoagulable states, cyanotic heart disease, oral contraceptives, polycytemia, haemoglobinopathy, leukemia, SLE

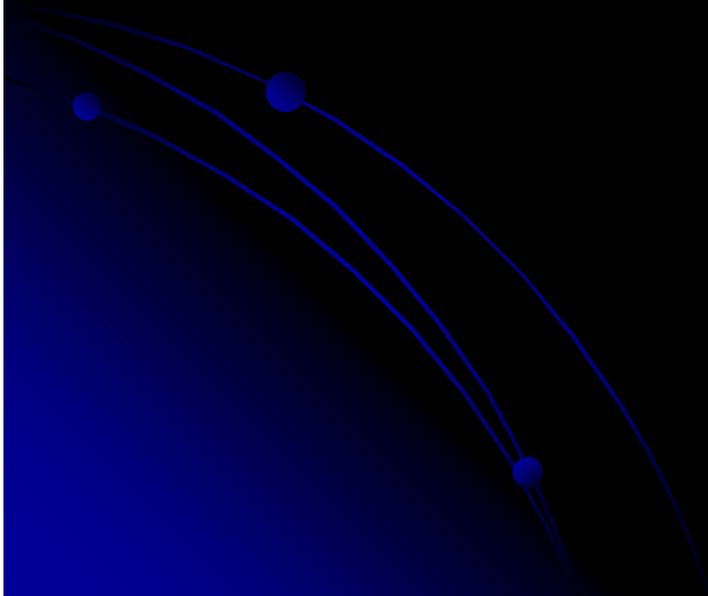
INVESTIGATIONS & TREATMENT

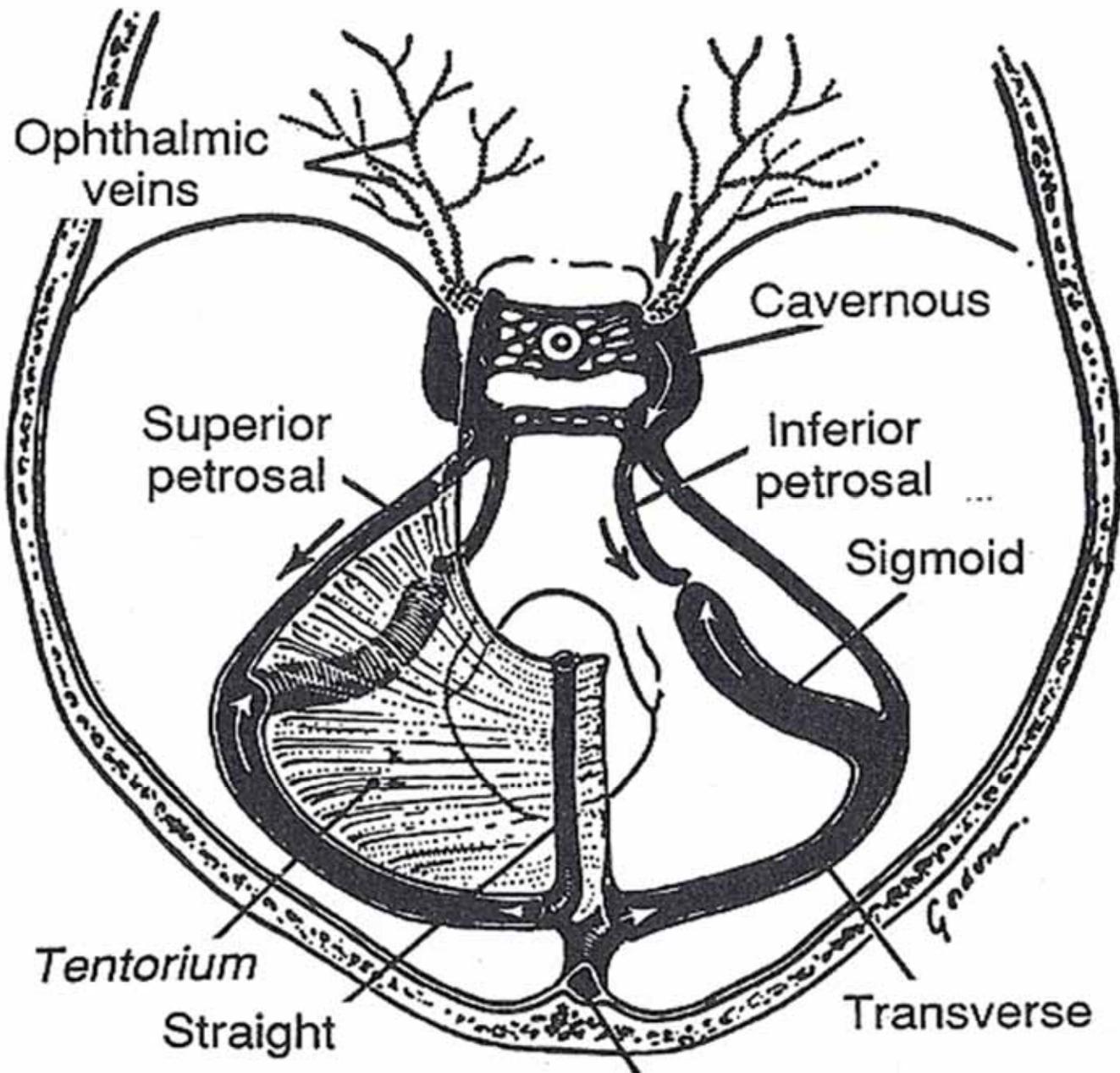
- MRI / MRV
 - Steroids, Antibiotics, mannitol, acetazolamide, anticoagulants
 - Lumbar puncture
 - CSF shunting
 - Optic nerve sheath fenestration
- 

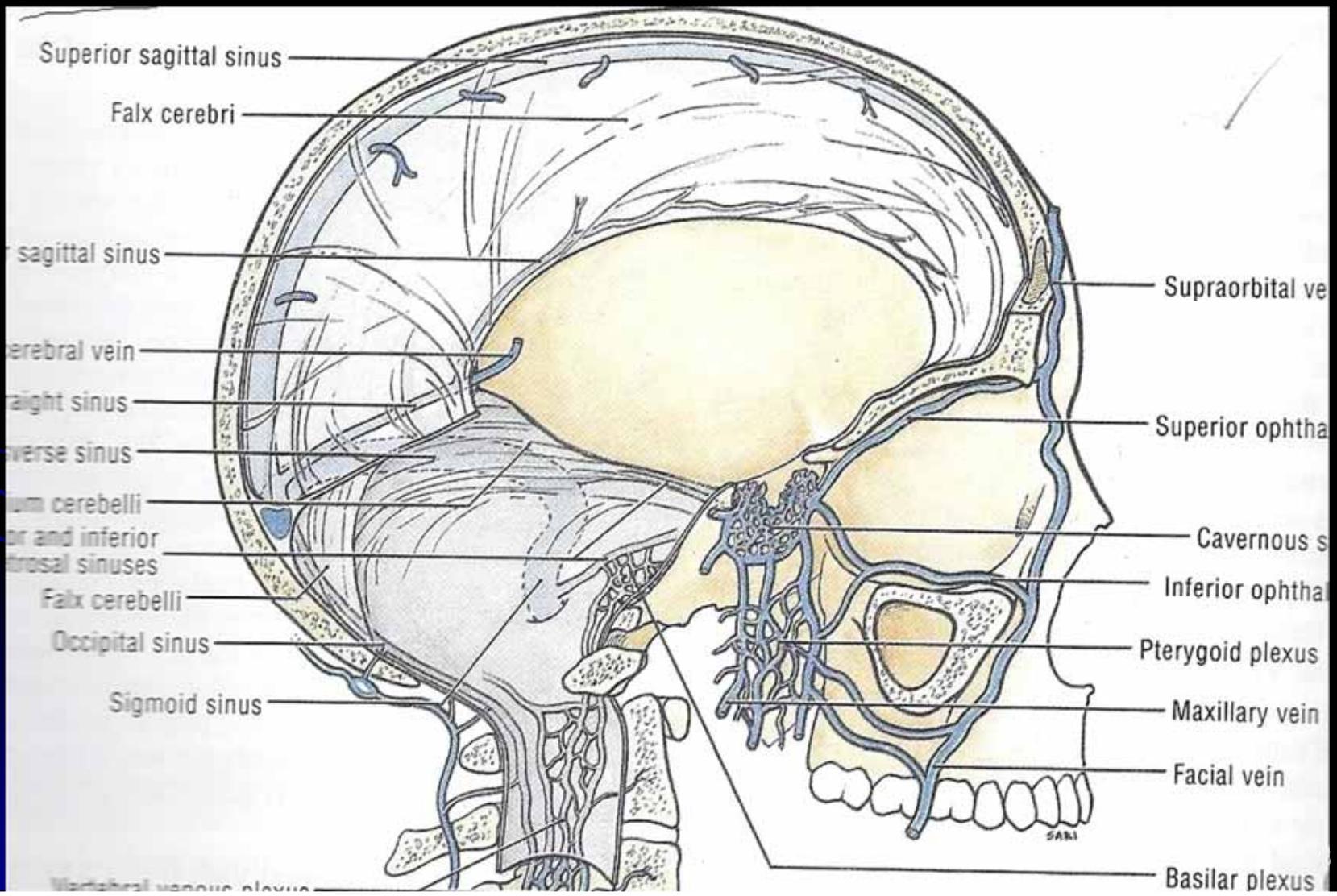
- OTITIC HYDROCEPHALUS can result in permanent vision loss and chronic headache

Although OTITIS MEDIA is a benign illness, clinicians must be alert to this complication

CAVERNOUS SINUS THROMBOSIS







ANATOMY

- Posterior intercavernous sinus superior and inferior petrosal sinuses
- Receive blood from superior and inferior ophthalmic vein
- They drain posteriorly and inferiorly through the superior and inferior petrosal sinuses and pterygoid plexuses

SPREAD

- Infections of
 - Face, nose, orbit, tonsils, soft palate, pharynx, air sinuses, middle ear and mastoid can all spread to cavernous sinuses
- Sphenoid and posterior ethmoid sinuses
- Jaw –tooth extraction, maxillary surgery via (pterygoid plexuses)

SYMPTOMS & SIGNS

- Fever
 - Ptosis/chemosis
 - Oculomotor palsies (III, IV, VI)
 - Contralateral hemiparesis (thrombosis ICA)
- 

CT brain

- Irregular filling defect
- Convex bulging of the lateral wall
- Dilatation of superior ophthalmic vein
- Thickening of extra ocular muscles and periorbital edema

TREATMENT

- **Antibiotics** (high doses)

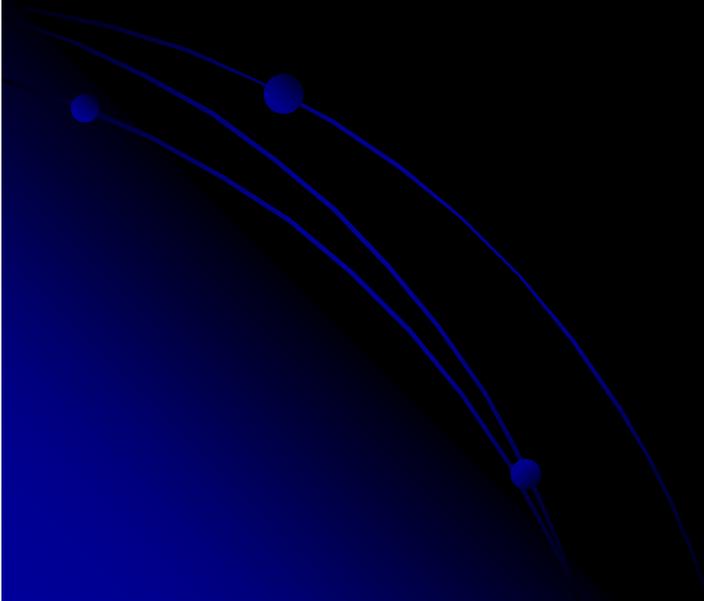
(*Staph aureus*, *Strep pneumonia*, *Haemophilus influenzae*)

- **Anticoagulant** (no evidence of cortical venous infarct)

- **Surgery**- sphenoid sinus sepsis

- 100 % mortality to 30 %

Otorhinogenic intracranial sepsis



Etiology

- Otorhinolaryngeal infection- 40-70 %

Paranasal sinusitis

Otitis media

Mastoiditis

- Cranial trauma- 6-30%

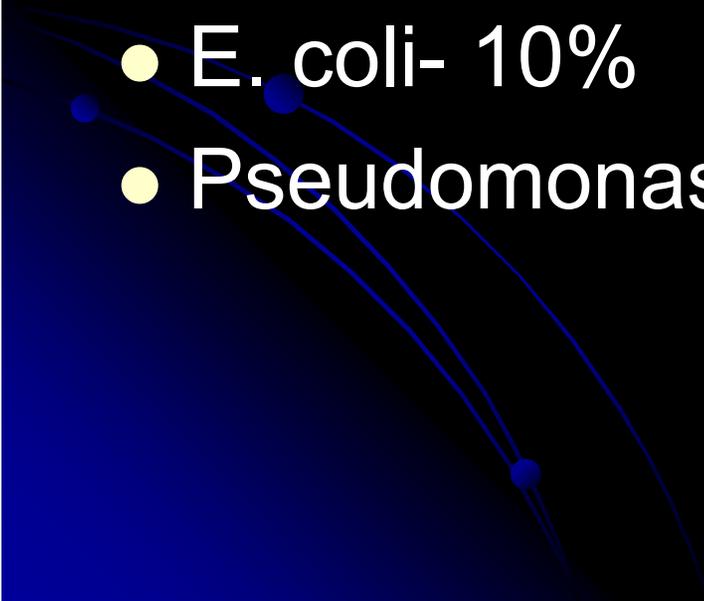
Predisposing factors

- Diabetes Mellitus
- Alcoholism
- Chest infection
- Sepsis
- HIV
- Immunodepression- steroids, cytotoxic drugs
- Poor nutrition, poor hygiene, delayed treatment

“Frequent use of broad spectrum antibiotics may contribute to subdural empyema”



Most common pathogens

- Strep pneumoniae- 16%
 - Group B strep- 13%
 - H. Influenzae- 13%
 - Salmonella spp- 13%
 - E. coli- 10%
 - Pseudomonas aeruginosa- 10%
- 

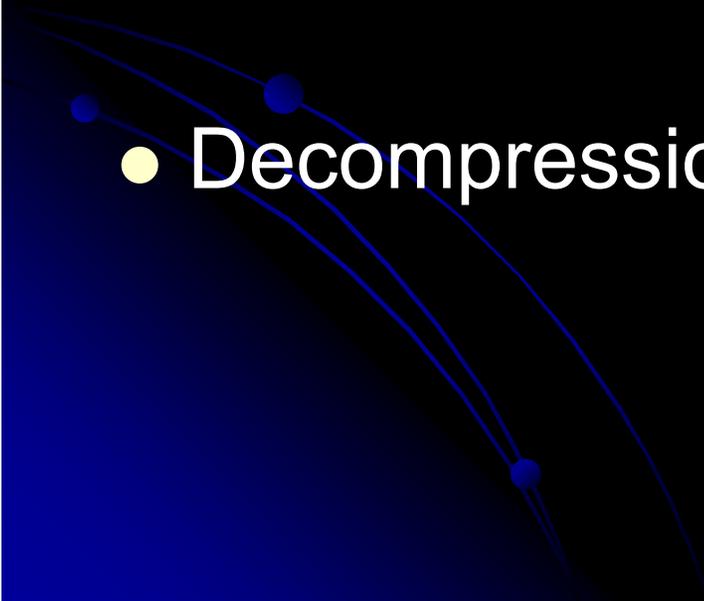
Management

- Timing of surgery

Simultaneous neurosurgical and ENT intervention

- SDE requires surgical evacuation of infected material, irrespective of its volume

Management

- Craniotomy was determined to be the surgical procedure of choice in SDE
 - Allows complete evacuation
 - Decompression of cerebral hemisphere
- 

Subdural Empyemas

Clinical Features	No. of Patients
Symptoms	
Fever	536 (77%)
Seizures	273 (39%)
Focal	204 (29%)
Generalized	76 (4.2%)
Headaches	221 (32%)
Periorbital edema	
Unilateral	124 (31%)
Bilateral	83 (12%)
Vomiting	60 (8.6%)
Purulent nasal discharge	20 (2.9%)
Macrocephaly	19 (2.7%)
Signs	
Meningism	514 (74%)
Pott's puffy tumor	234 (33%)
Eyelid abscess	84 (12%)
Signs of tentorial herniation	40 (5.7%)
Hemiparesis and VIIth cranial nerve palsy	89 (13%)
Hemiparesis	178 (25.5%)
Monoparesis	28 (4%)
Gaze palsy	4 (0.6%)
Speech abnormalities	2 (0.3%)
No focal signs	289 (41%)

TABLE 6. Bacteriological Spectrum for 699 Patients with Subdural Empyemas

Organism	No. of Patients
Sterile	123 (17.6%)
<i>Streptococcus milleri</i>	121 (17.3%)
<i>Streptococcus B. haemolyticus</i>	51
Anaerobic organisms	42
<i>Staphylococcus aureus</i>	33
<i>Staphylococcus epidermidis</i>	31
<i>Haemophilus influenzae</i>	25
<i>Proteus mirabilis</i>	23
Multiple organisms	
>2	65
>3	34
<i>Escherichia coli</i>	17
<i>Pseudomonas aeuroginosa</i>	12
<i>Klebsiella pneumonia</i>	12
<i>Enterobacteriaceae</i>	5
<i>Acinetobacter anitratis</i>	4
<i>Enterococcus faecalis</i>	3
<i>Mycobacterium tuberculosis</i>	1
<i>Salmonella typhi</i>	1

TABLE 2. Source of Infection Related to Age (n = 699)

Cause	No. of Patients							Total
	0-5 yr	6-10 yr	11-20 yr ^a	21-30 yr	31-40 yr	41-50 yr	51-70 yr	
Paranasal sinusitis	12	103	328 (70%)	22	2	1	1	469 (67%)
Otogenic source	4	12	33	4	3	3	5	64
Trauma	6	3	11	16	9	8	4	57
Miscellaneous	7	4	3	3	3	3	8	31
Meningitis	72	1					73	
Dental caries	1		1	1	2			5
Total	102	123	376 (54%)	46	19	15	18	699

^a P < 0.001.

TABLE 3. Clinical Features for 699 Patients with

Prognosis

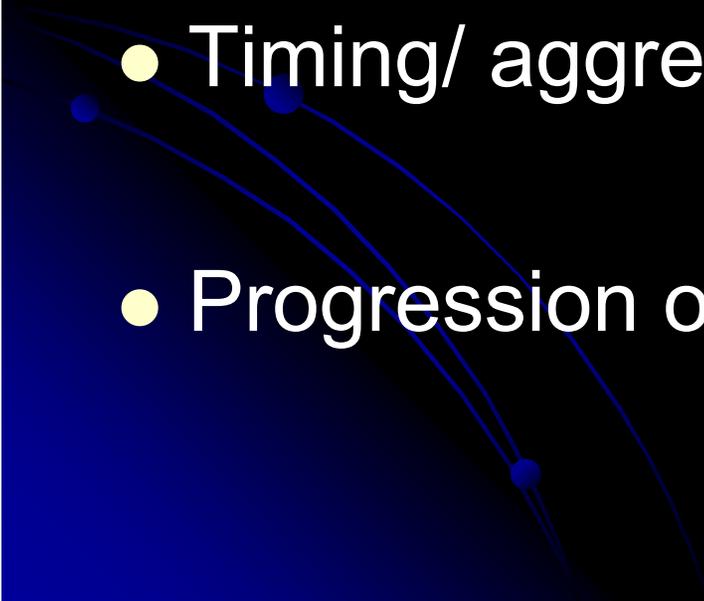
- Early diagnosis and treatment

- High degree of suspicion

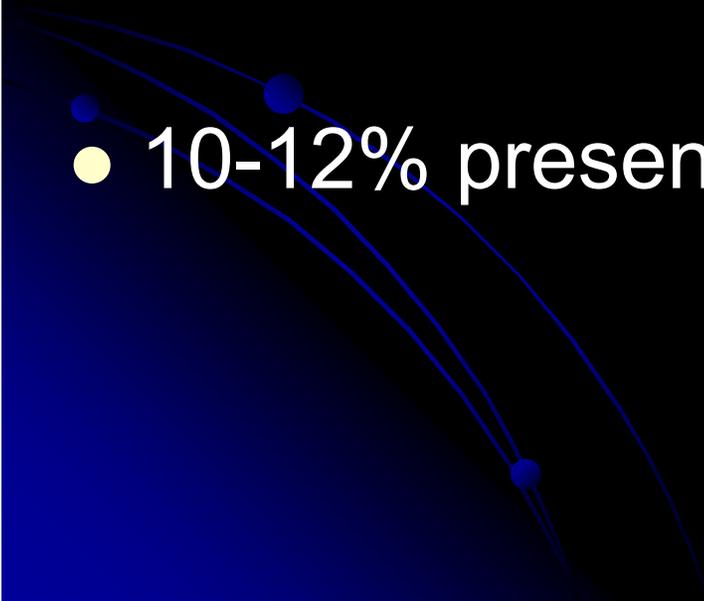
“Prolonged fever, seizures, neurological signs”



Prognostic factors

- Age
 - GCS
 - Timing/ aggressiveness of treatment
 - Progression of disease
- 

Outcome

- Mortality- 100% before advent of antibiotics & CT
 - Decreased to 40% after CT Scan
 - 10-12% presently
- 

- **Intracranial subdural empyema is a neurosurgical emergency**
 - **It is rapidly fatal if not recognised early and managed promptly**
- 

- **Early drainage, simultaneous eradication of the primary source of sepsis and intravenous administration of high doses of appropriate antibiotics agents represents the mainstay of treatment**
- 

DIAGNOSIS

- **Infective sinustis**
- **Periorbital swelling (Pott's Puffy tumour)**
- **Purulent nasal discharge**
- **Positive Neurosurgical signs**



**MUST HAVE CT SCAN BRAIN
& PNS**

THANK YOU

