Brain Abscesses

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Introduction

Intracranial abscesses include

- brain abscess
- subdural empyema
- extradural empyema

and are classified according to the anatomic location or etiologic agent.

Vectors

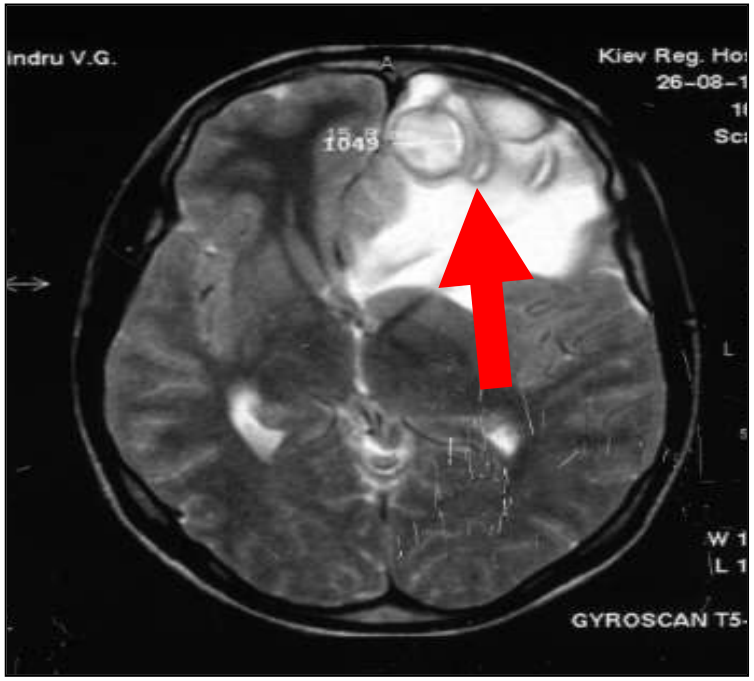
- Hematogenous spread (25% of cases)
  - The chest is the most common sourse
- Contiguous spread (45-50% of cases)
  - Purulent nasal sinusitis
  - Middle-ear and mastoid air sinus infection (temporal lobe and cerebellar abscess)
    - Spread by local osteomyelits or or phlebitis of emissary veins
- Following penetrating cranial trauma (10% of cases)

Histologic staging of cerebral abscesses

Stage	Histologic characteristics
1	early cerebritis: early infection & inflammation, poorly demarcated from surrounding brain, toxic changes in neurons, perivascular infiltrates
2	late cerebritis: reticular matrix (collagen precursor) & developing necrotic center
3	early capsule: neovascularity, necrotic center, reticular network surrounds (less well developed along side facing ventricles)
4	late capsule: collagen capsule, necrotic center, gliosis around capsule

Classification

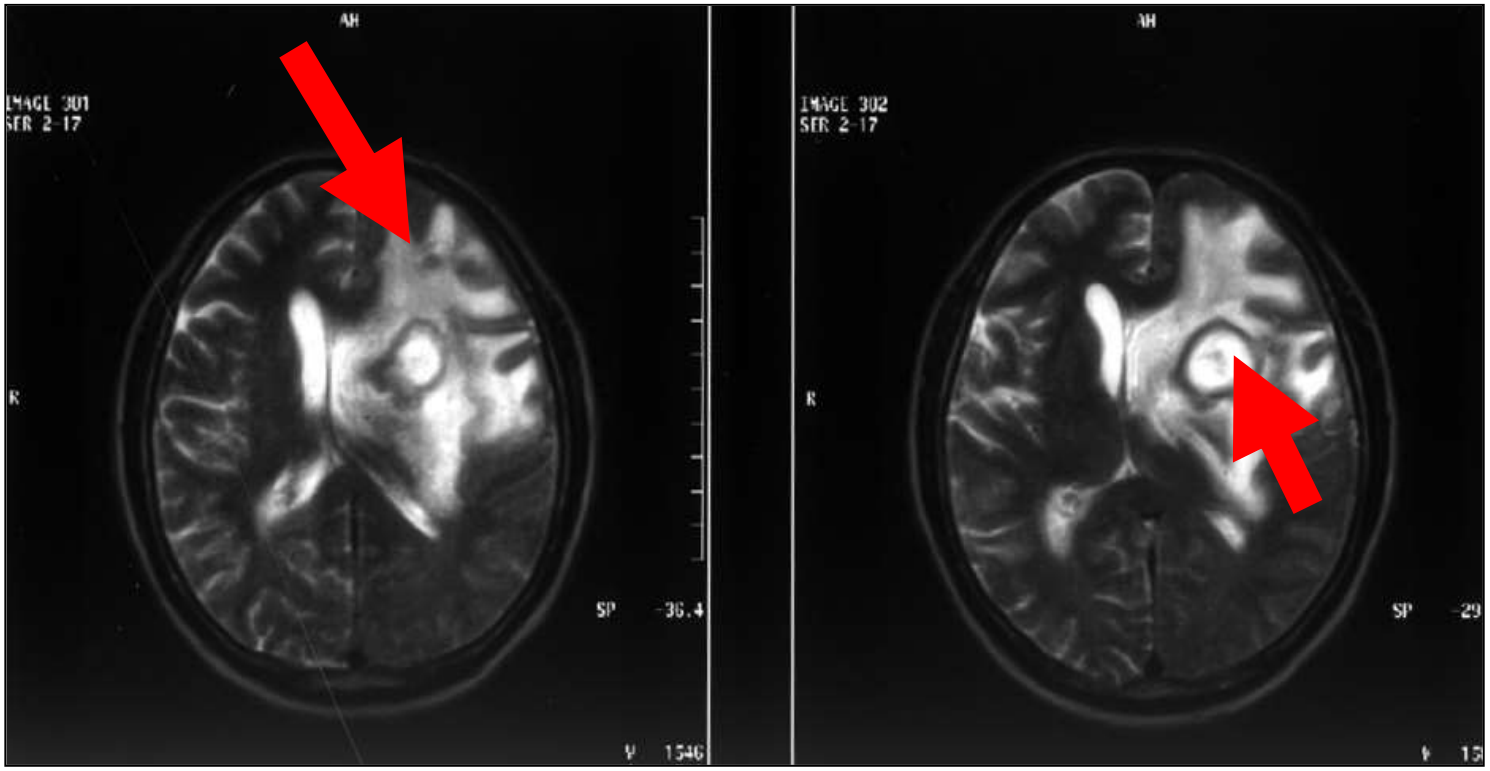
ADJACENT ABSCESSES



Rhinogenic abscess

Classification

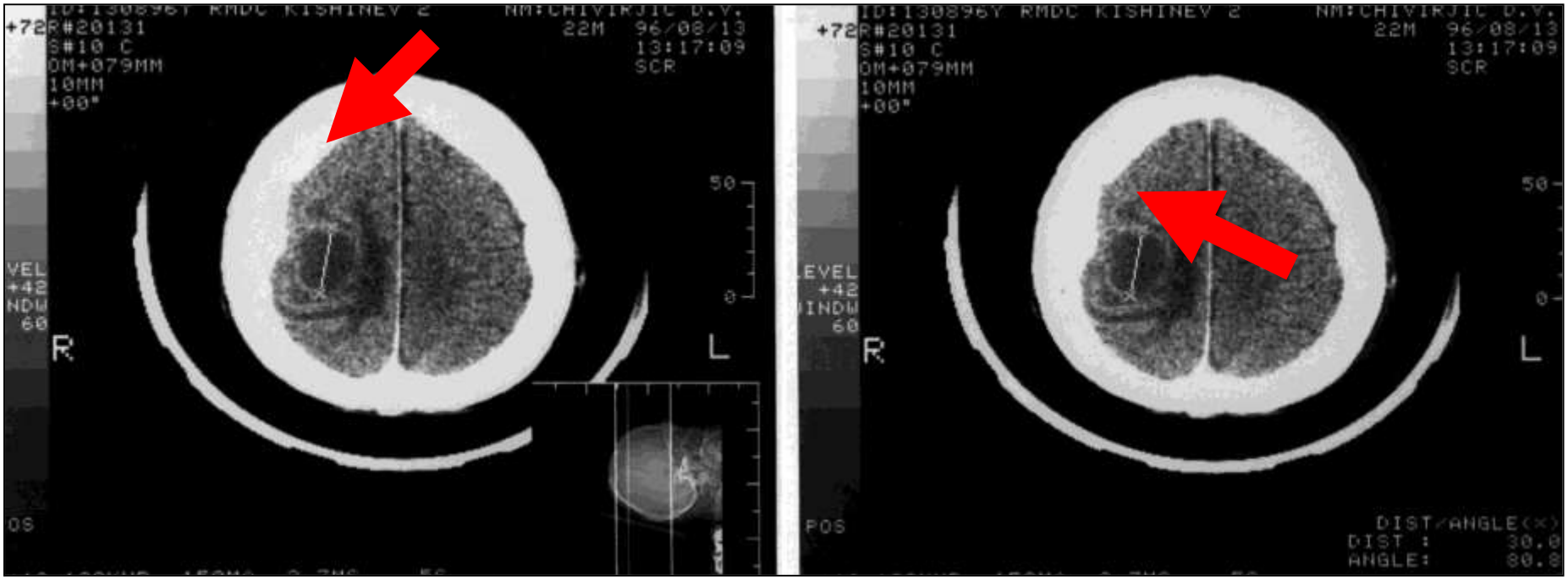
METASTATIC ABSCESSES



Pulmonary origin abscess

Classification

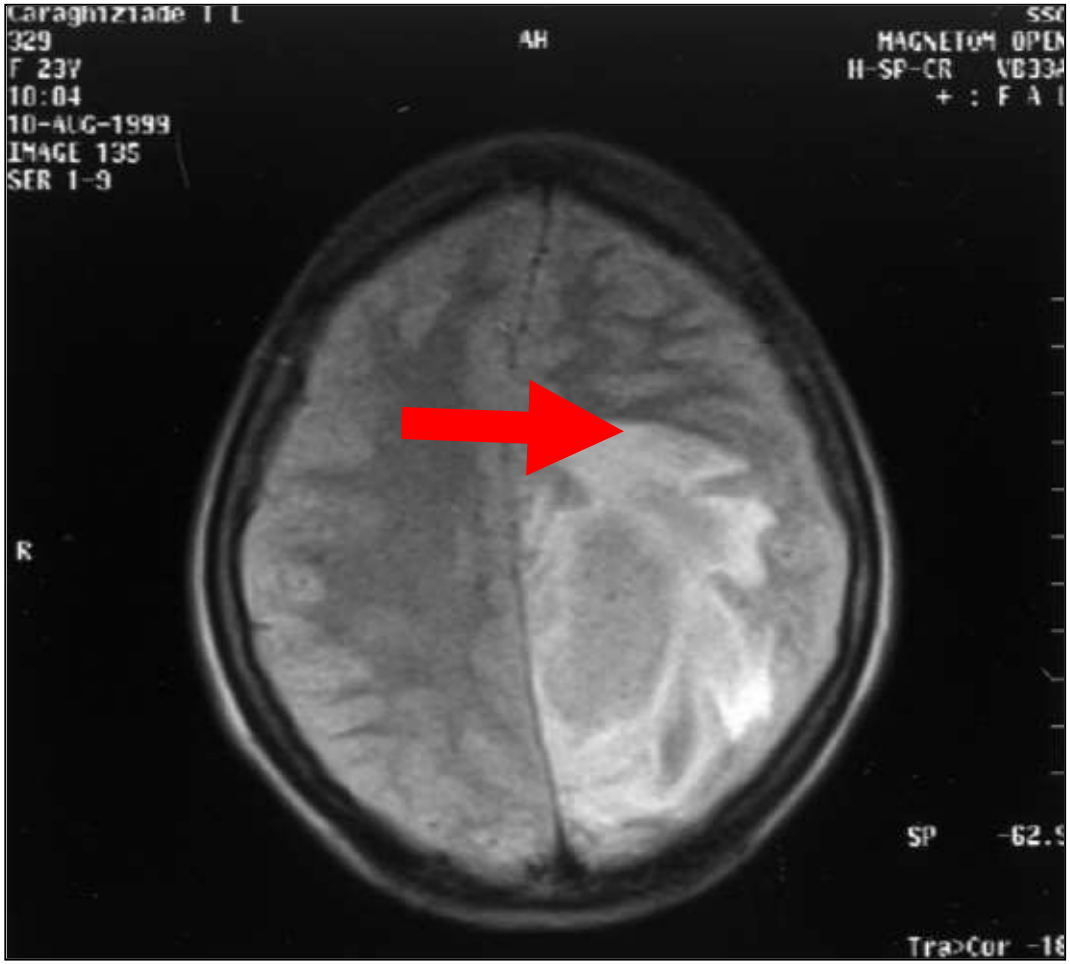
POSTTRAUMATIC



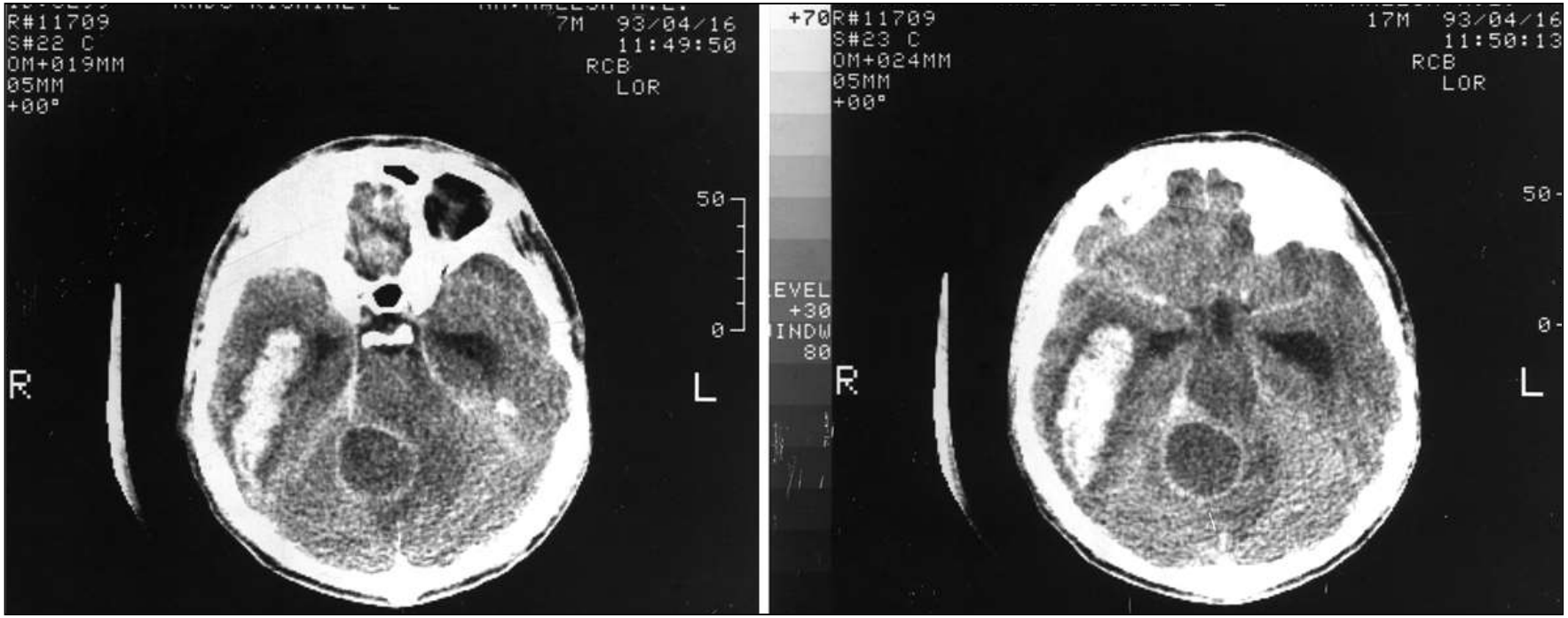
Acute (up to 14 days)
Subacute (14 –30 days)
Chronic (30 days- 1 year)
Late (more than 1 year after trauma)

Classification

UNKNOWN ORIGIN



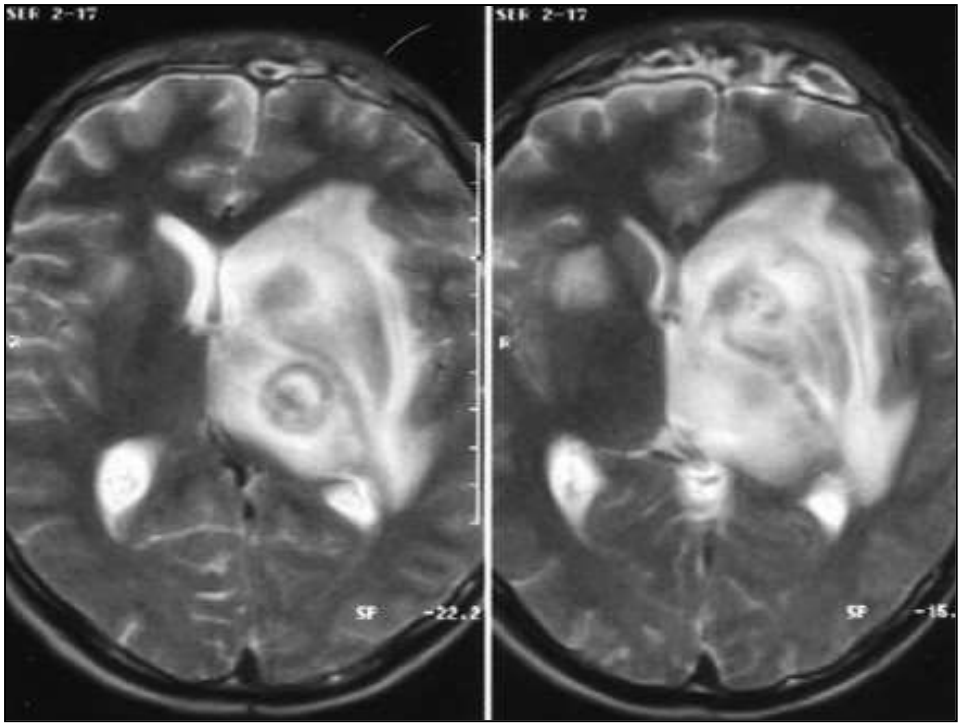
MORGFOPATHOLOGIC CLASSIFICATION



Unique of regular form and variable size (most frequent)

Multicameral with irregular form (metastatic)

Multiple isolated abscesses



AIDS

Clinical

- fever
- headache
- focal neurologic deficit

Physical

- The clinical picture of brain abscess usually is manifested by symptoms of a space-occupying lesion.
- The symptoms and signs include the following
    - Fever (may be low-grade or high)
    - Persistent headache that often is localized
    - Drowsiness
    - Confusion
    - Stupor
    - General or focal seizures
    - Nausea and vomiting
    - Focal motor or sensory impairments
    - Papilledema
    - Ataxia
    - Hemiparesis

Causes

The predominant organisms include the following:

- *Staphylococcus aureus*
- Streptococci (especially *Streptococcus intermedius*)
- *Bacteroides* and *Prevotella* species
- Enterobacteriaceae
- *Pseudomonas* species
- Other anaerobes

Lab Studies

Routine tests

- WBC > 10000
- Serum C-reactive protein (CRP)
- Blood cultures (at least 2; preferably prior to antibiotic usage)
- RBC sedimentation rate is elevated.

Imaging Studies

- Skull films can be important in the diagnosis of sinusitis or the presence of free gas in the abscess cavity.
- CT scan, preferably with contrast administration, detect
  - the size
  - number
  - location of abscesses

Imaging Studies

- MRI is considered by many to be the diagnostic method of choice.
- It can permit accurate diagnosis and excellent follow-up of the lesions because of its superior sensitivity and specificity.

Treatment

- Medical treatment is considered alone if
  - Poor surgical candidate
  - Multiple abscesses
  - Abscess in critical location, especially dominant hemisphere
  - Concomitant meningitis
- Indications for initial surgical treatment
  - Significant mass effect
  - Proximity to ventricle
  - Significantly increased ICP
  - Poor neurologic condition

Treatment

Medical Care:

- Before the abscess has become encapsulated and localized, antimicrobial therapy, accompanied by measures to control increasing intracranial pressure, is essential.
- Once an abscess has formed, surgical excision or drainage combined with prolonged antibiotics (usually 4-8 wk) remains the treatment of choice.

Surgical treatment

- Needle aspiration
  - Multiple or deep lesion
  - Immature lesion
- Surgical excision
  - Prevents recidivism
  - Shortens the length of time on antibiotics
  - Recommended in traumatic abscesses to debride foreign material