Case #110

NAME Educational Activities Committee

Case provided by:

Dr. Hind ABOUZAHIR, MD, PhD
Assistant Professor and Medical Examiner at Medico-legal Institute, Ibn Rochd University Hospital, Casablanca, Morocco

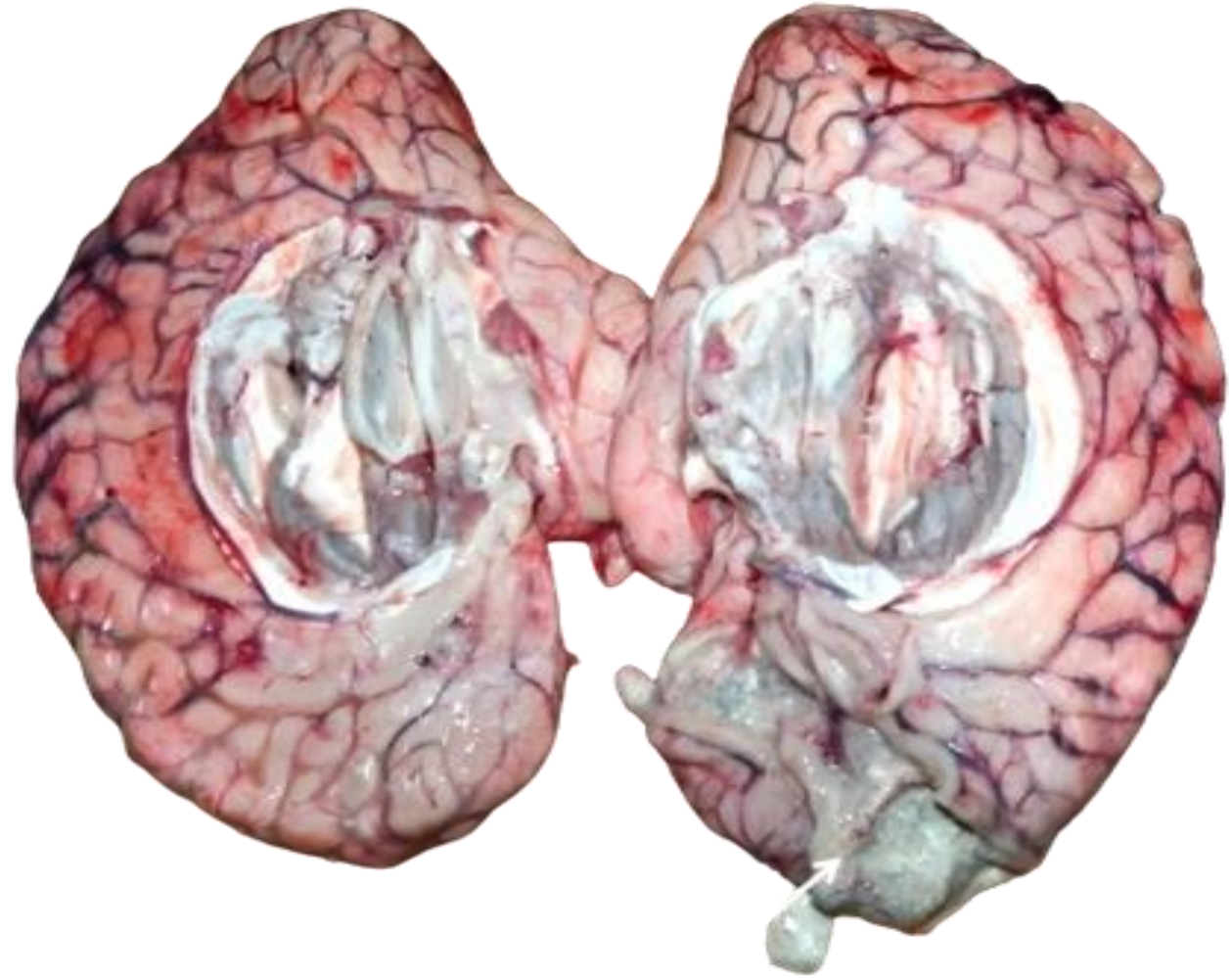
Dr Barthelemy Munkana Matadi
Medical resident , Medico-Legal institute, Ibn Rochd university hospital, Casablanca, Morocco

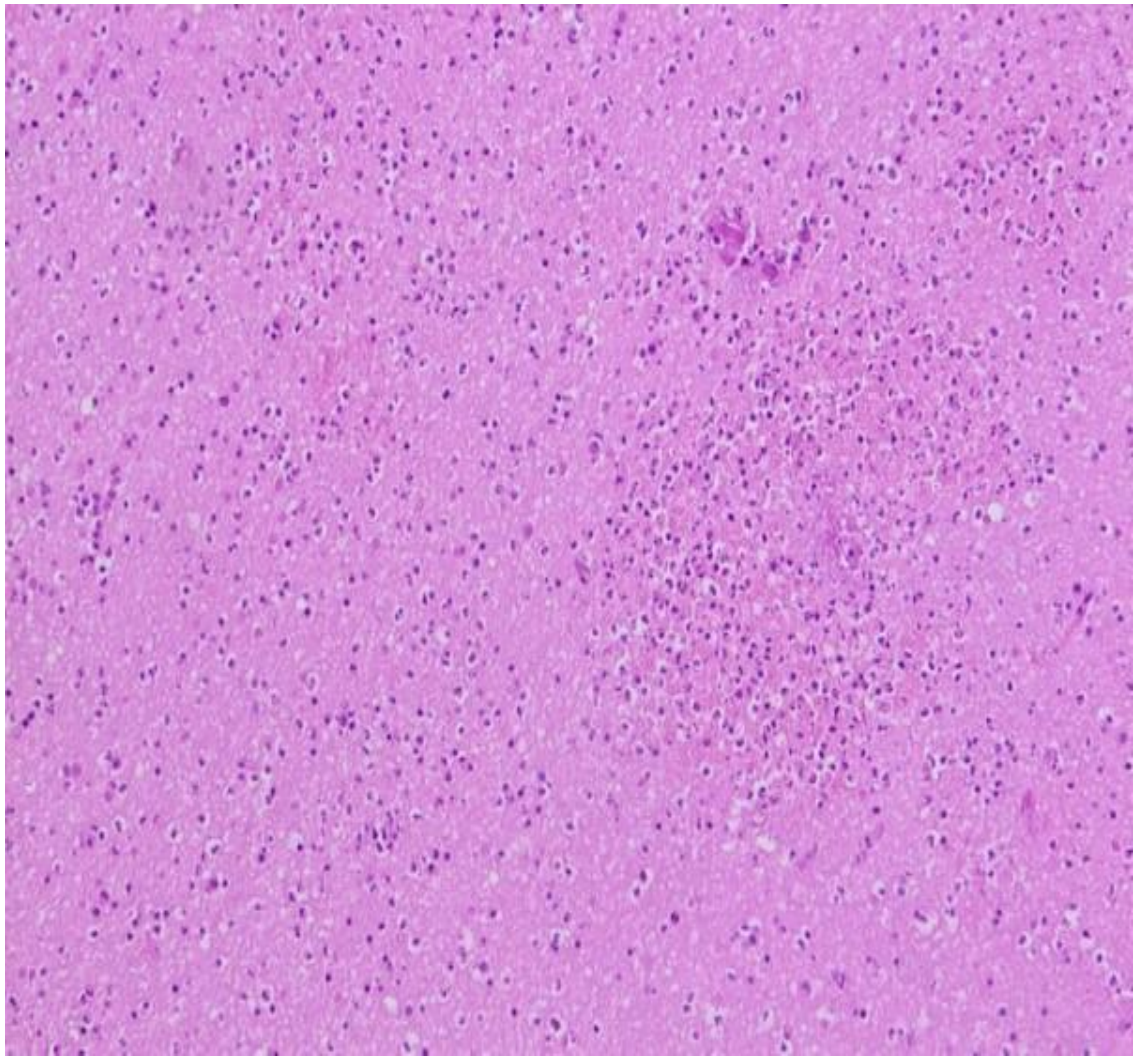
1. A 21-year-old male with no significant medical history presented with headaches and visual disturbances. He received symptomatic treatment and a referral to an ophthalmologist. The following morning, he experienced another episode of headaches, decreased visual acuity, and became unconscious. He was transported to the emergency room and died within hours of admission.

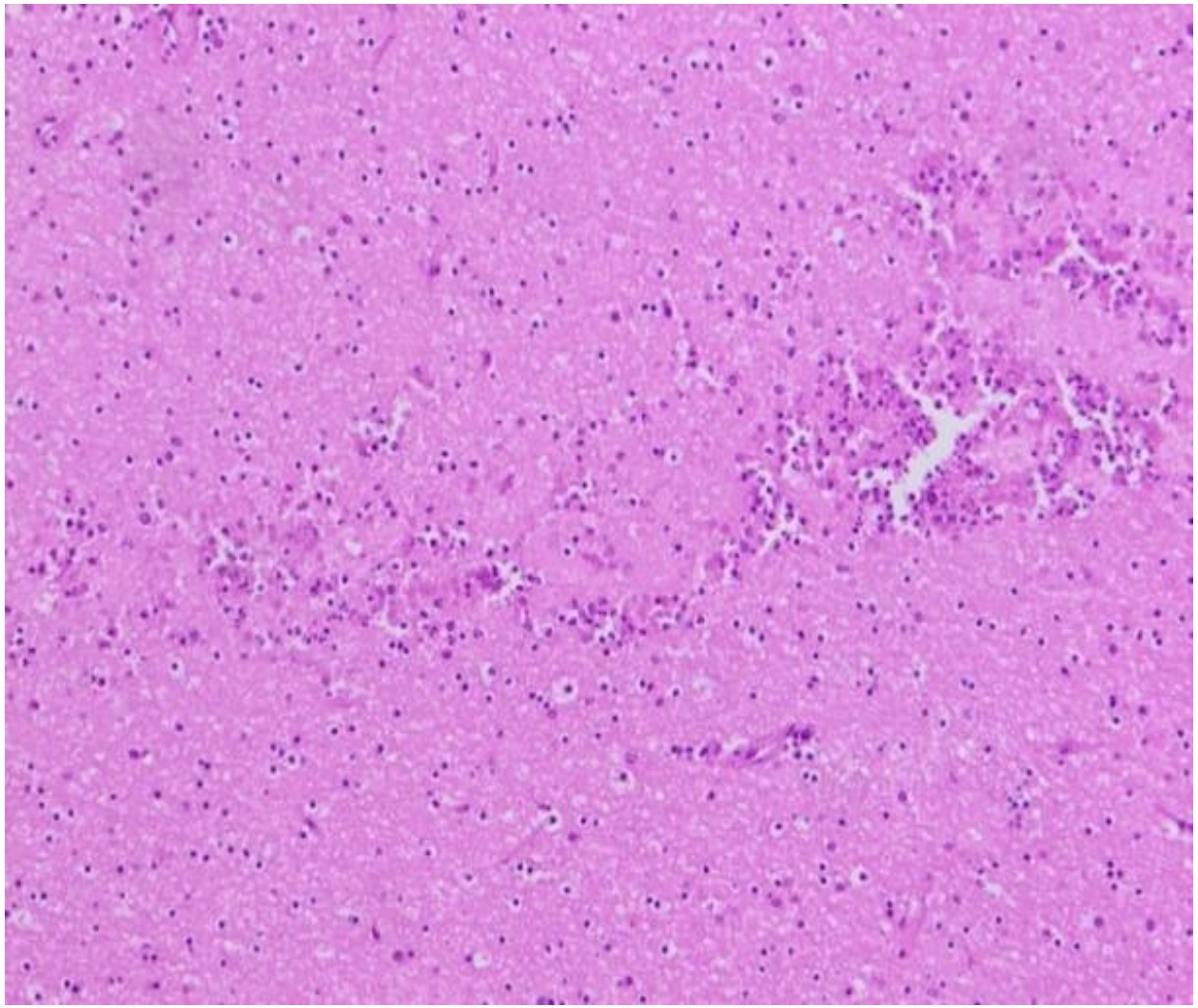
Autopsy revealed bilateral purulent filling of the frontal sinuses, more pronounced on the right, and purulent secretions on the pia mater. A heterogeneous left basifrontal intraparenchymal formation with irregular contours and a friable necrotic core, measuring approximately 08 x 05 x 03 cm, was identified. This lesion exerted a mass effect on the midline.

The gross and microscopic findings are most consistent with which of the following?

- ◯ Glioblastoma
- ◯ Reactive gliosis with subacute suppurative inflammatory changes
- ◯ Chronic encephalitis
- ◯ Cerebral infarction





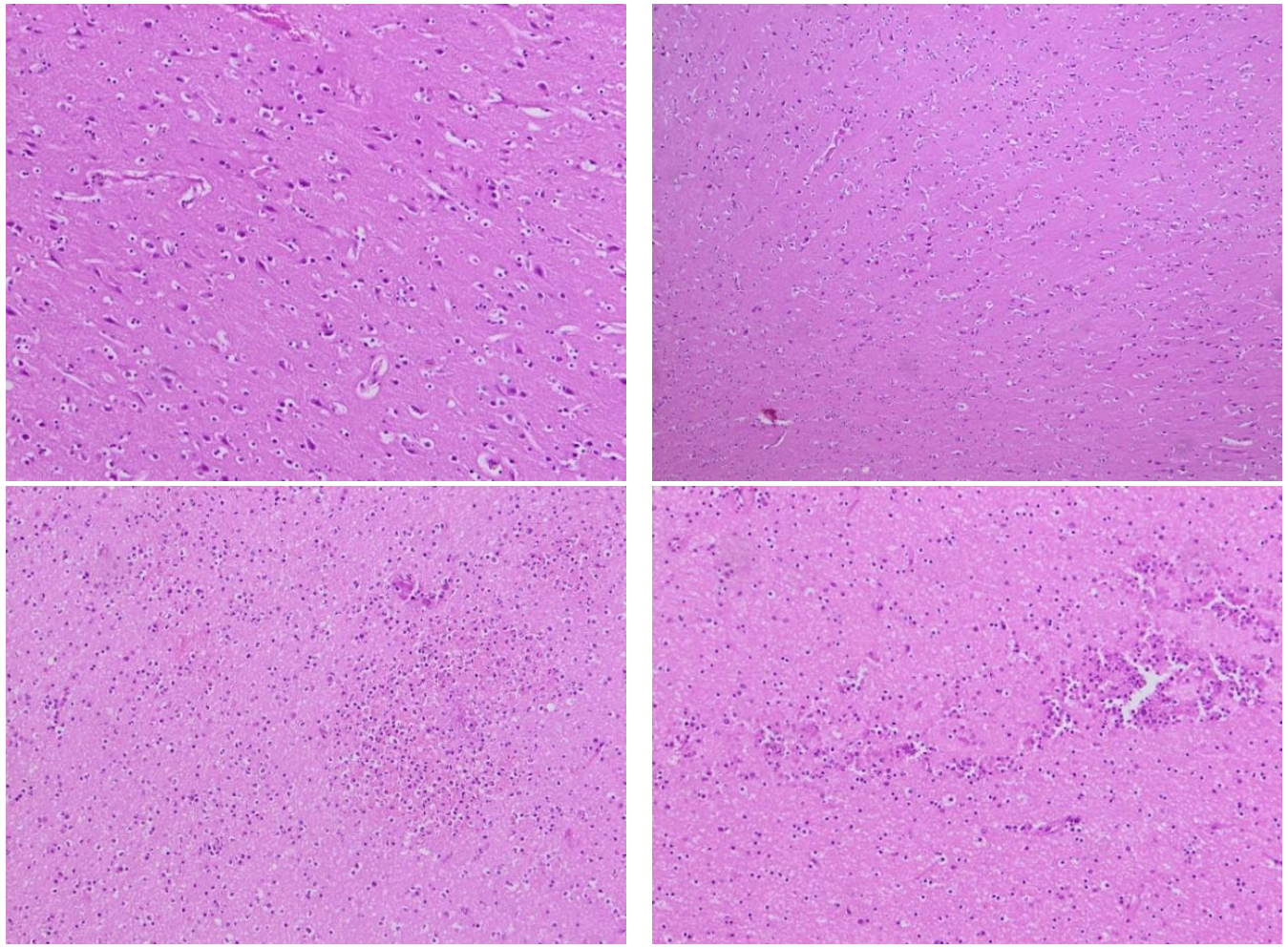


Answer...

B. Reactive gliosis with subacute suppurative inflammatory changes (CORRECT ANSWER, 66.99 % of responses)

The pictured findings were consistent with reactive gliosis with subacute suppurative inflammatory changes. Reactive gliosis is a process involving the proliferation of glial cells in response to injury in the central nervous system. The presence of subacute suppurative inflammatory changes indicates an ongoing inflammatory process, typically characterized by the infiltration of neutrophils, leading to the formation of pus.

In the presented case, pus samples from the brain, its coverings, and the frontal sinuses revealed the presence of **Streptococcus constellatus.** This supports the diagnosis of a bacterial infection causing significant inflammatory response and tissue damage.

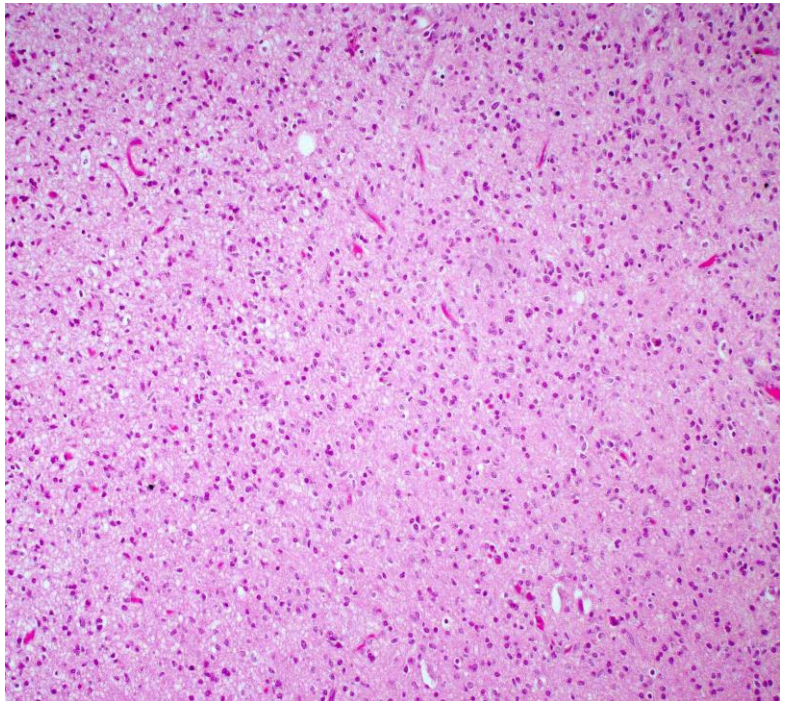


Other Answers...

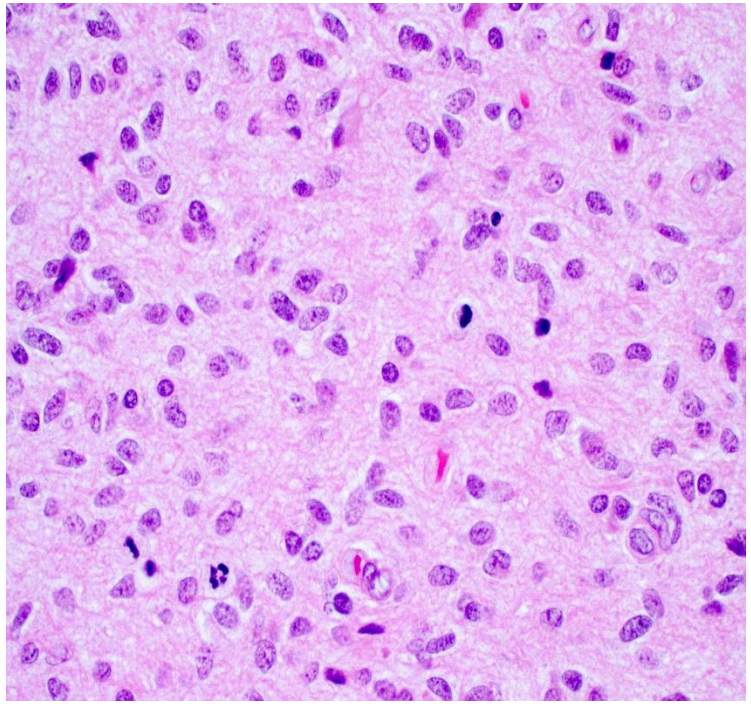
A. Glioblastoma (11.78 % of responses)

Glioblastoma is a highly malignant primary brain tumor characterized by rapid growth and necrosis.

Histologically, it shows marked cellularity, pleomorphism, mitotic figures, microvascular proliferation, and necrosis. The provided histological images of the presented case do not show these features; instead, they show reactive gliosis and inflammatory changes without the characteristics of glioblastoma.



***Small cell glioblastoma with small monomorphic nuclei (H&E, 100x).**
Contributed by Bharat Ramlal, M.D.



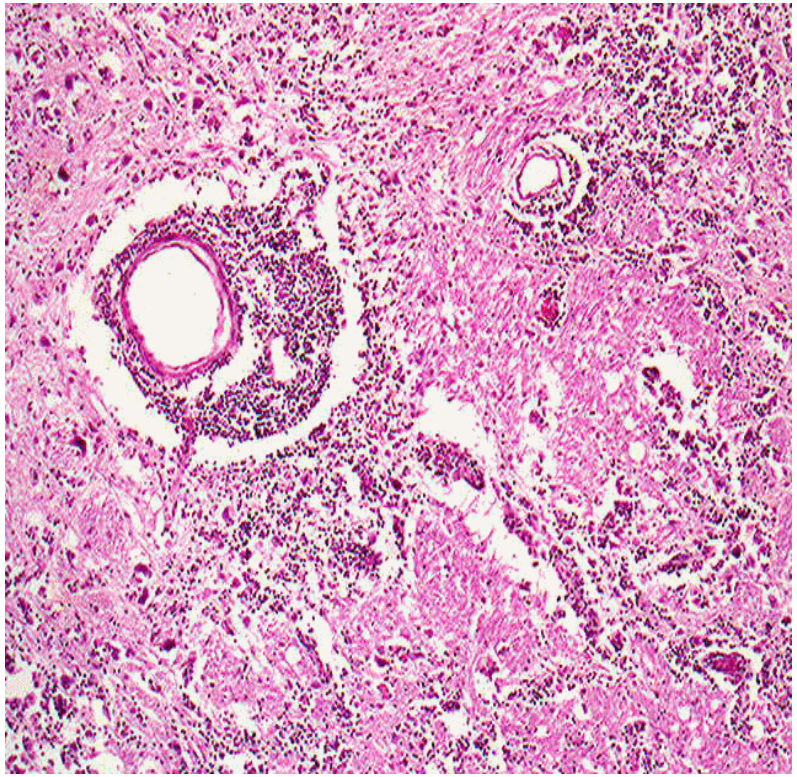
***Small cell glioblastoma with abundant mitotic activity (H&E, 400x).**
Contributed by Bharat Ramlal, M.D.

***Ramlal B, Morris M. Glioblastoma, IDH wild type. PathologyOutlines.com website. https://www.pathologyoutlines.com/topic/CNStumorgliomasglioblastomasIDHwildtype.html. Accessed July 22nd, 2024.**

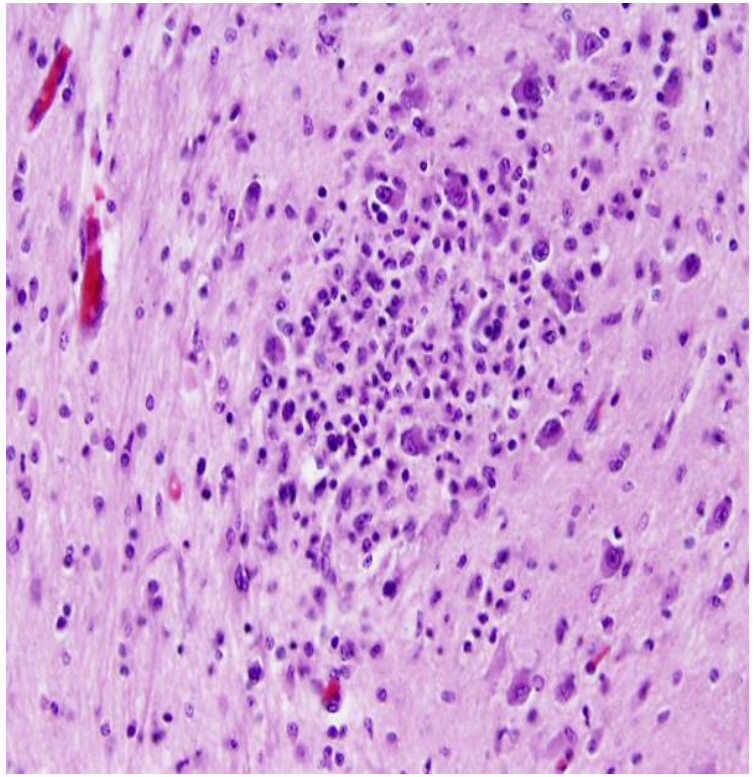
C. Chronic Encephalitis
(16.99 % of responses)

Chronic encephalitis involves long-term inflammation of the brain, typically with lymphocytic infiltration and microglial nodules, sometimes associated with viral infections.

The histological images of the presented case do not show chronic inflammatory cells like lymphocytes or microglial nodules, but rather acute suppurative inflammation, making chronic encephalitis less likely.



***Encephalitis: Nonsuppurative inflammation (no polys). There is a characteristic perivascular mononuclear cell infiltrate (mostly lymphocytes).**

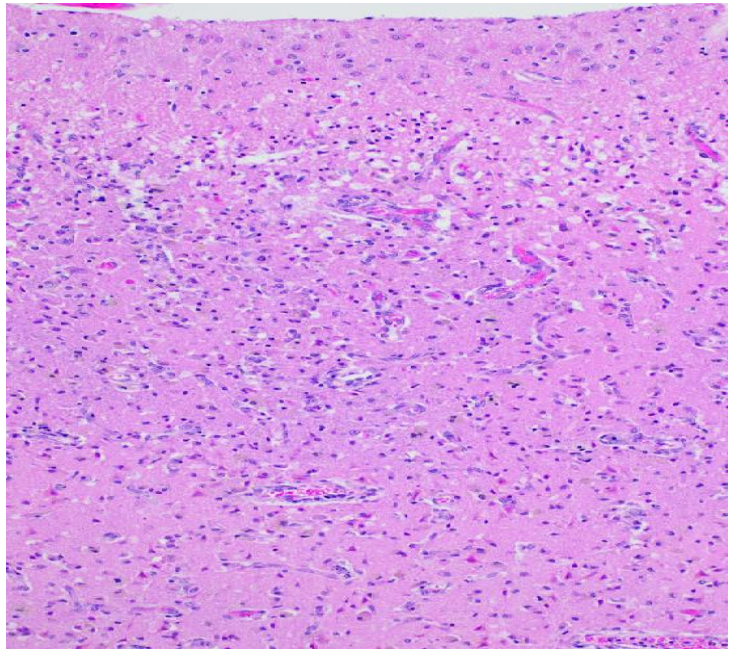


****Viral Encephalitis: Microglial nodule**

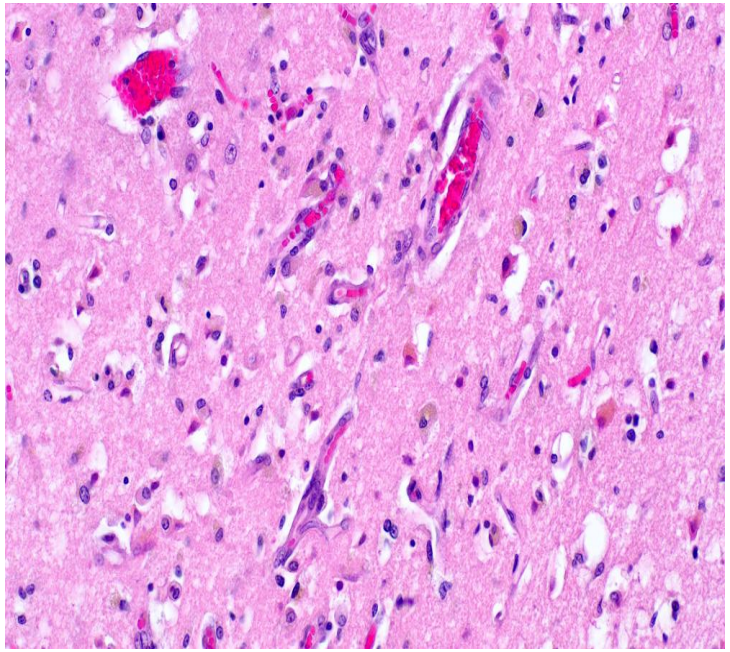
D. Cerebral Infarction
(4.25 % of responses)

Cerebral infarction refers to the death of brain tissue due to ischemia. Histologically, acute infarcts show eosinophilic neurons, loss of tissue architecture, and infiltration by macrophages in subacute stages.

The provided histological images of the presented case do not demonstrate these ischemic changes but instead show reactive gliosis with neutrophilic infiltration indicative of an infectious process rather than ischemic injury.



***Subacute infarct characterized by reactive gliosis, neuropil vacuolation, neovascularization, red neurons and scattered macrophages.**
Contributed by Javier Redding-Ochoa, M.D.



***Plump, reactive endothelium, macrophages with hemosiderin and scattered red neurons in a subacute infarct.**
Contributed by Javier Redding-Ochoa, M.D.

***Redding-Ochoa J, Morris M. Ischemic stroke / infarct. PathologyOutlines.com website. https://www.pathologyoutlines.com/topic/cnsstroke.html. Accessed July 22nd, 2024.**

REFERENCES

1. Rivera-Zengotita M, Yachnis AT. Gliosis versus glioma?: don't grade until you know. Adv Anat Pathol. 2012 Jul;19(4):239-49. doi: 10.1097/PAP.0b013e31825c6a04.
2. Chrastek D, Hickman S, Sitaranjan D, Vokshi I, Kakisi O, Kadlec J, Bartosik W, Van Tornout F, Kouritas V. Streptococcus constellatus Causing Empyema and Sepsis, Necessitating Early Surgical Decortication. Case Rep Infect Dis. 2020 Jul 12;2020:4630809. doi: 10.1155/2020/4630809.
3. Wall EC, Chan JM, Gil E, Heyderman RS. Acute bacterial meningitis. Curr Opin Neurol. 2021 Jun 1;34(3):386-395. doi: 10.1097/WCO.0000000000000934.
4. Joseph, R., Zunt., Kelly, J., Baldwin. "Chronic and subacute meningitis.." 18 (2012).:1290-1318. doi: 10.1212/01.CON.0000423848.17276.21,
5. Guarner, J., Liu, L., Bhatnagar, J. et al. Neutrophilic bacterial meningitis: pathology and etiologic diagnosis of fatal cases. Mod Pathol 26, 1076–1085 (2013). https://doi.org/10.1038/modpathol.2013.30,
6. Mikkelsen VE, Solheim O, Salvesen Ø, Torp SH. The histological representativeness of glioblastoma tissue samples. Acta Neurochir (Wien). 2021 Jul;163(7):1911-1920. doi: 10.1007/s00701-020-04608-y.
7. Alam, Ali & Easton, Ava & Nicholson, Timothy & Irani, Sarosh & Davies, Nicholas & Solomon, Tom & Michael, Benedict. (2022). Encephalitis: Diagnosis, management and recent advances in the field of encephalitides. Postgraduate Medical Journal. 99. postgradmedj-2022. 10.1136/postgradmedj-2022-141812.
8. Mena H, Cadavid D, Rushing EJ. Human cerebral infarct: a proposed histopathologic classification based on 137 cases. Acta Neuropathol. 2004 Dec;108(6):524-30. doi: 10.1007/s00401-004-0918-z.