COMPUTED TOMOGRAPHY CHARACTERISTIC BRAIN ABSCESS MIMICING TUMOUR IN 73 YEARS-OLD PATIENT: CASE REPORT

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Abstract: Computed Tomography Characteristic Brain Abscess Mimicing Tumour In 73 Years-Old Patient: Case Report. *Radiological examination with contrast can usually differentiate tumors from bleeding because the boundary between tumor and bleeding is usually clearer. This case report describes a patient with a CT scan result in a patient suspected of bleeding from a brain tumor with a differential diagnosis of brain abscess. A 73-year-old woman came to the emergency room with complaints of a decrease of consciousness. On neurological examination there was no neck stiffness, the impression of weakness on the left side, the tone of the left side decreased and the strength in the left extremity also decreased. CT scan without contrast was carried out and it was found that impression of a mass with haemorhagic intra-tumoral transformation with surrounding edema and left hypodense cortical subcortical temporoparietal lesion showing infection with brain edema and midline shift to the left. CT-scan of the head with contrast showed that suspicioun for malignant brain mass, metastases with haemorrhage. The patient also underwent an anatomical pathology examination and found that the morphological picture suggests an acute suppurative inflammatory process, there are no visible signs of malignancy in this preparation. An individual with symptoms and indicators similar to both a brain tumor and an abscess is reported in this case study. Because the images from CT scans of brain tumors and abscesses are similar, the diagnosis of one condition must also be made based on the observation of other symptoms or on additional investigation.*
Keywords*: Brain Abscess, Brain Tumour, Computed Tomography Scan*

Abstrak: Karakteristik Tomografi Komputasi Abses Otak Yang Menyerupai Tumor Pada Pasien Usia 73 Tahun: Laporan Kasus. Pemeriksaan radiologis dengan kontras biasanya dapat membedakan tumor dari perdarahan, karena batas antara tumor dan perdarahan biasanya lebih jelas. Laporan kasus ini menggambarkan seorang pasien dengan hasil CT scan pada pasien yang diduga mengalami perdarahan dari tumor otak dengan diagnosis banding abses otak. Seorang wanita berusia 73 tahun datang ke ruang gawat darurat dengan keluhan penurunan kesadaran. Pada pemeriksaan neurologis tidak ditemukan kaku kuduk, kesan kelemahan pada sisi kiri, tonus sisi kiri menurun dan kekuatan pada ekstremitas kiri juga menurun. Dilakukan CT scan tanpa kontras dan ditemukan kesan massa dengan transformasi pendarahan intra-tumor dengan edema di sekitarnya dan lesi temporoparietal kortikal subkortikal hipodens kiri yang menunjukkan infeksi dengan edema otak dan pergeseran garis tengah ke kiri. CT-scan kepala dengan kontras menunjukkan adanya kecurigaan massa otak ganas, metastasis disertai perdarahan. Pasien juga menjalani pemeriksaan patologi anatomi dan menemukan bahwa gambaran morfologi menunjukkan adanya proses inflamasi supuratif akut, tidak ada tanda-tanda keganasan yang terlihat pada sediaan ini. Seorang individu dengan gejala dan indikator yang mirip dengan tumor otak dan abses dilaporkan dalam studi kasus ini. Karena gambar dari CT scan tumor otak dan abses serupa, diagnosis satu kondisi juga harus dibuat berdasarkan pengamatan gejala lain atau pemeriksaan tambahan.
Kata Kunci : Abses otak, Tumor Otak, Pemindaian Tomografi Terkomputasi

INTRODUCTION

A computerized x-ray imaging technique known as computed tomography, or CT, involves fast rotating a narrow x-ray beam over the patient's body. CT scans are useful for determining the presence of illness or damage in different body parts. Additionally, CT can be used to image the head in order to find lesions, tumors, clots that could cause a stroke, bleeding, or other disorders (Baratloo et al., 2018; Bottari et al., 2023). Certain forms of CNS malignancies increase the risk of tumor-related bleeding, particularly when anticoagulation is given because of tumor hemostatic consequences or comorbidities. The size of the tumor and the patient's age may also have an impact on the frequency of bleeding. Notably, cerebral bleeding can be the initial indication of a brain tumor in 5–10% of cases with intracranial tumors. Brain tumors, both primary and metastatic, may be linked to intratumoral bleeding. In 5–8% of GBM patients and 7–14% of oligodendroglioma cases, bleeding often happens throughout the course of highly malignant gliomas. However, bleeding can also occur in some low-grade tumors such as pilocytic astrocytoma, meningioma, pituitary adenoma, or hemangioblastoma (Ostrowski et al., 2022).

Although the precise processes underlying the bleeding inside the brain tumor are unknown, anomalies in tumor vascularization appear to have the most significant impact on the etiopathogenesis. Hemorrhages may result from the existence of many thin-walled, poorly formed, or dilated arteries as well as from the microvascular proliferation associated with endothelial cell hyperplasia after obliteration. The newly developed veins within the bulk of the tumor are dysfunctional due to many structural defects (Choi et al., 2015; Zienius et al., 2019).

Radiological examination with contrast can usually differentiate tumors from bleeding, because the boundary between tumor and bleeding is usually clearer. In contrast, even with the use of contrast material, intertumoral hemorrhage may be confused with spontaneous ICH if the tumor is broken down by a significant hemorrhage or if it is difficult to discriminate between both of them. Therefore, the underlying condition that may cause ICH cannot be ruled out by CT with contrast. However, the diagnosis remains unclear since the appearance of a brain abscess on a CT scan might be mistaken for a brain hemorrhage. Histopathological analysis can be used to distinguish brain parenchyma from hematoma specimens, potentially leading to the detection of brain malignancies (Bottari et al., 2023; Varshney et al., 2016). This case report describes a patient with a CT scan result in a patient suspected of bleeding from a brain tumor with a differential diagnosis of brain abscess.

CASE PRESENTATION

A 73-year-old woman came to the emergency room with complaints of decrease of consciousness. The patient has experienced decreased consciousness since yesterday afternoon. Apart from that, the patient complained of fever and cough since 3 days ago, other complaints such as shortness of breath, nausea, vomiting and headache were denied. History of trauma denied. The patient's history of DM and HT was denied. The patient has no history of taking regular medication.

The patient's vital signs showed that they were somnolence, that their temperature was 36, that their saturation was 92 RA with a GDS of 161 gr/dl, that their blood pressure was 110/70 mmHg, that they were RR 24 times per minute, and that their pulse was 123 times per minute. Rhonchi noises were detected during the patient's physical examination of the lungs. A neurological examination revealed minimal neck stiffness, a left side impression of weakness, a drop in left side tone, and a decrease in left extremities strength.

During the patient's follow-up examination, a CT-scan of the head without contrast was carried out and it was found that an isodense lesion with abnormal hyperdense was seen in which

there was a blood density with sharp borders, irregular intra-axillary supratentorial edges, right temporoparietal area, measuring 5x2.9x4.4 cm, impression of a mass with haemorhagic intra-tumoral transformation with surrounding edema and left hypodense cortical subcortical temporoparietal lesion showing infection with brain edema and midline shift to the left.

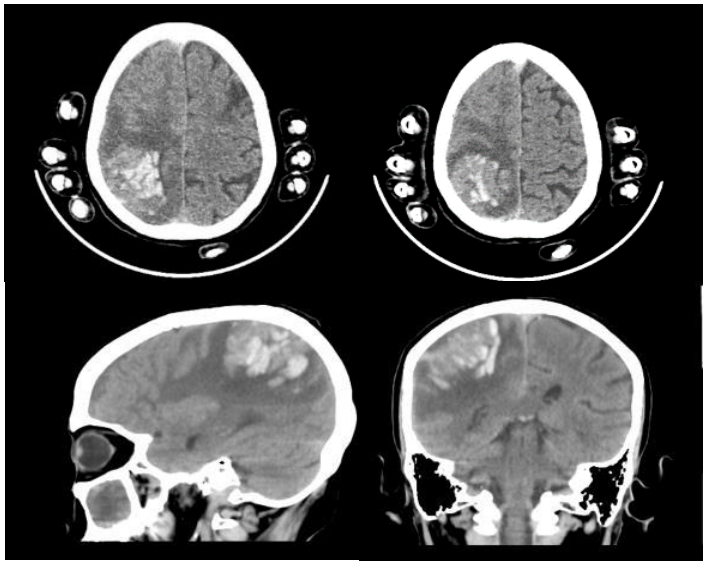

Figure 1. CT-scan image of the head without contrast

Then the patient underwent a CT-scan of the head with contrast and a picture of an isodense lesion with abnormal hyperdense was obtained in which the blood density had firm boundaries, irregular borders, intra-axillary supratentorial right temporoparietal area, measuring 5x2.9x4.4cm which appeared heterogeneous enhancement, suspicious for malignant brain mass, metastases with haemorrhage. Intra-tumoral transformation with surrounding edema and left hypodense cortical subcortical temporoparietal lesion, impression of infection with brain edema and midline shift to the left.

In this patient, ICH evacuation craniotomy and tumor resection were performed. Then the patient underwent a histopathological examination on microscopic examination of pieces of tissue consisting of hyalinized and fibrotic connective tissue, bleeding and some necrosis. There was a proliferation of blood vessels with reactive endothelium as well as dense neutrophil PMN inflammatory cells. There is no visible malignancy in this preparation. In conclusion, the morphological picture suggests an acute suppurative inflammatory process and there are no visible signs of malignancy in this preparation.

In this patient, ICH craniotomy and tumor resection were performed, then osteoplasty was performed. The patient also underwent an anatomical pathology examination. On microscopic examination the tissue sections consisted of hyalinized and fibrotic connective tissue, bleeding and some necrosis. There was also proliferation of blood vessels with reactive endothelium and a dense dusting of neutrophil PMN inflammatory cells (Figure 3). There are no signs of malignancy in this preparation. The conclusion of the resection on the right parietal, the morphological picture suggests an acute suppurative inflammatory process, there are no visible signs of malignancy in this preparation.

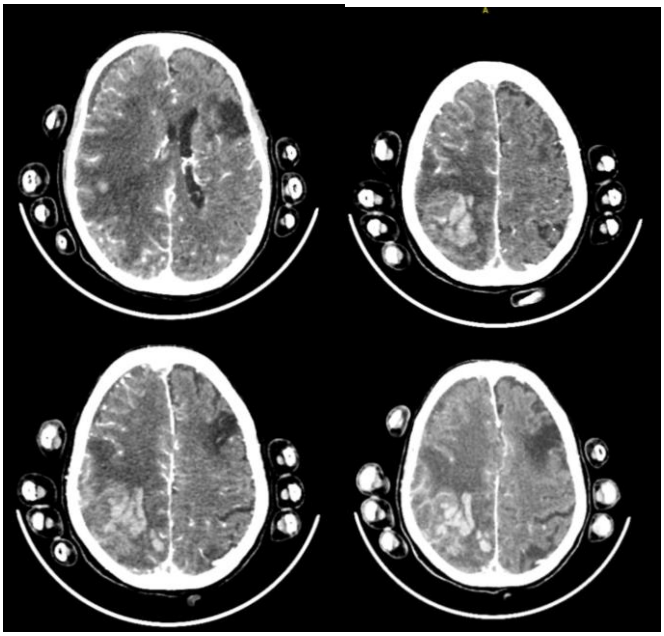

Figure 2. CT image – head scan with contrast

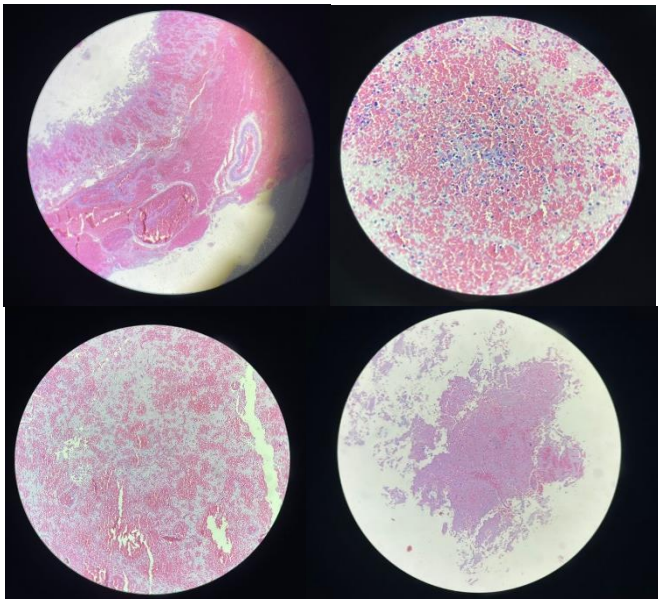

Figure 3. Proliferative blood vessels in PA sample

DISCUSSION

In this patient, a 73-year-old female patient was found who was suspected of having complaints such as increased intracranial pressure, namely decreased consciousness. This finding was accompanied by fever and cough since 3 days ago and there were physical examination findings of weakness in one part of the body. This disorder is often found in patients with stroke or suspected brain tumors. Individuals exhibiting concerning "high risk" symptoms, such as localized neurological impairments resulting from brain tumors, are often identified expeditiously, either by the emergency department or by direct referral to a specialized clinic (such as a TIA/stroke clinic). On the other hand, people who present with less severe, more common symptoms (such headaches, changes in personality or

cognition, or a mix of these) are the hardest to identify and may have them for a few weeks before a professional is consulted. This patient's age and symptoms lead to the suspicion that they have a brain tumor, with other space-occupying lesions such brain abscesses being considered as a differential diagnosis (Zienius et al., 2019).

Patients with brain abscesses also have similar complaints to this patient. Headache is the most common clinical sign of a brain abscess. Absence of fever and altered state of awareness is common. Neurologic symptoms might be mild for days or weeks and are dependent on the location of the abscess. Patients with frontal or right temporal lobe abscesses may experience behavioral abnormalities. Individuals who have brain stem or cerebellar abscesses may exhibit headaches, impaired mental state due to hydrocephalus, cranial nerve palsy, or gait abnormalities (Muchsin et al., 2017). Therefore, this patient has a differential diagnosis of brain abscess.

An impression of a mass with hemorrhagic intra-tumoral transformation and surrounding edema was found on a CT scan without contrast. Additionally, a left hypodense cortical subcortical temporoparietal lesion displaying infection, brain edema, and a left midline shift was observed. A contrast-enhanced CT scan revealed questionable findings for a malignant brain tumor, metastases, and bleeding. It might be challenging to distinguish brain abscesses using CT or MR imaging from cystic or necrotic tumors. The combination of sometimes unclear clinical signs and similarities in the morphologic appearance of various intracranial mass lesions, such as cystic gliomas, metastases, and brain abscesses, makes diagnosing intracranial abscess difficult (Lai et al., 2002).

A brain abscess is a small region of necrosis in the brain parenchyma that has a membrane around it. Infections are the most common cause of brain abscesses, while trauma is also a possible cause. The lesion's stage determines the imaging results. Early cerebritis frequently manifests as an erratic, low-density region that either seldom exhibits patchy enhancement or does not enhance at all. A more noticeable lesion that enhances the rim appears as the cerebritis progresses. Early cerebritis on CT results in patchy enhancement that develops into a rim of enhancement in late cerebritis, which eventually forms the brain abscess. One important histopathologic distinction is that, unlike an abscess around a purulent cavity, the rim enhancement of late cerebritis is not linked to collagen deposition. Patients with late abscesses have gradually lessening mass effect and edema on subsequent CT scans. The wall of a brain abscess is often smooth and regular, ranging in thickness from 1 to 3 mm, and it is surrounded by parenchymal edema. In the deep white matter, the ring of enhancement may be relatively thin on the medial or ventricular surface where vascularity is less prevalent. Its thickness may also not be consistent. Steroid treatment suppresses edema and contrast enhancement. It is common to observe multi-location with satellite lesions or subjacent daughter abscesses. Gas now suggests the presence of gas-forming microbes (Bokhari & Mesfin, 2022; Muchsin et al., 2017; Toh et al., 2014). Based on anatomical pathology findings, it was found that there was no malignancy, only tissue necrosis, evidence of bleeding, and hyalinized and fibrotic connective tissue suggesting a brain abscess.

CONCLUSION

An individual with symptoms and indicators similar to both a brain tumor and an abscess is reported in this case study. A CT scan with contrast showed a suspicious picture of a brain tumor accompanied by bleeding but based on the anatomical pathology results it was found that there was no malignancy so the patient was diagnosed with a brain abscess. Because the images from CT scans of brain tumors and abscesses are similar, the diagnosis of one condition must also be made based on the

observation of other symptoms or on additional investigation.

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