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Rokhaya Diajhete
Geriatric Department - Fann
University Hospital Center -
Dakar, Senegal

Massamba BA
Geriatric Department - Fann
University Hospital Center -
Dakar, Senegal

Yakhya Cisse
Neurosurgery Department -
Fann University Hospital
Center - Dakar, Senegal

Assane Sall
Geriatric Department - Fann
University Hospital Center -
Dakar, Senegal

Dalahata BA
Geriatric Department - Fann
University Hospital Center -
Dakar, Senegal

Mamadou Coumé
Geriatric Department - Fann
University Hospital Center -
Dakar, Senegal

Corresponding Author:
Rokhaya Diajhete
Department of Geriatric, Fann
University Hospital Center,
Dakar, Senegal

Glioblastoma and COVID-19 in an elderly patient about a case: Review of the literature

**Rokhaya Diajhete, Massamba BA, Yakhya Cisse, Assane Sall, Dalahata
BA and Mamadou Coumé**

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Abstract

The coronavirus 2 epidemic responsible for severe acute respiratory syndrome (SARS-CoV-2) has an impact on the management of glioblastomas and changes perioperative practice worldwide in case of comorbidity. We report the first case in the literature of an association of Glioblastoma and COVID-19 in an elderly subject. The assumptions made below will likely confirm further studies in the future. This is a 65-year-old patient whom we followed for Glioblastoma. He was hospitalized in the emergency room of the Fann University Hospital in Dakar due to disorders of consciousness. It was during hospitalization at the émergence room that he probably contracted COVID-19 then treated and declared cured. After healing, a slight improvement in disturbances of consciousness was observed. The patient then underwent a subtotal excision of his brain tumor with a histopathological exam. It was a glioblastoma. We can say that COVID-19 infection delays the management of patients with Glioblastoma. This single case report only suggests an association between COVID-19 infection and Glioblastoma. We encourage other authors to share their experiences to confirm our hypotheses and formulate therapeutic guidelines.

Keywords: Glioblastoma, COVID-19, elderly patient, infection

Introduction

Glioblastoma is the most common primary brain malignancy in adults, accounting for 60 to 70% of high grade gliomas [1]. Epidemiological studies carried out over the past two decades show that the incidence of glioblastoma is closely related to age and that this incidence is constantly increasing in the elderly population. Unfortunately, advanced age is a very poor prognostic factor for high grade gliomas [2]. The management of high-grade tumors is associated with a low survival rate [3]. The biopsy allows on the one hand to have a histology in order to be able to differentiate the glioblastoma from other non-tumor pathologies (Pyogenic abscess, mycosis, parasitosis, etc.); on the other hand allows to do immunohistochemistry and molecular biology which will help in the realization of radio-chemotherapy [4]. The Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) or Coronavirus Disease 2019 (COVID-19) is primarily a respiratory pathology that is responsible for the ongoing pandemic around the world [5]. The literature relating the association of COVID-19 and glioblastoma is very rare. In this manuscript, we report the very first case in a 65-year-old patient followed in our department for a brain tumor. He was received in May 2020 in the emergency room of the Fann hospital for neurological degradation where he probably contracted COVID-19.

Patient and observation

A 65-year-old man, right-handed, known hypertensive and smoking weaned, followed in Fann's neurosurgery department for a brain tumor which had to be operated on after the completion of the preoperative assessment. He was taken to the emergency room for severe headache, associated with seizures and functional impairment of the left hemibody. The neurological examination carried out initially found: a Glasgow score at 15/15, his right pupil was reactive and the left could not be examined because of a cataract, a left hemiparesis at 4/5, the Osteotendinous reflexes were sharp, left Hoffman's sign was positive in the left upper limb as was Babinski's sign.

The initial general examination showed a temperature of 37.7 °C, a blood pressure of 140/90 mmHg, a heart rate of 65 beats / min, a respiratory rate of 18 cycles / min. The cardiorespiratory examination performed initially was also normal. The brain CT scan without and with injection showed a right temporal lesion process with a large edematous area overflowing in the frontal and parietal areas, annular enhancement, irregular and responsible for falx involvement. Magnetic resonance imaging showed the same lesion (Figure 1). An extension assessment had been requested, namely a thoraco-abdomino-pelvic CT scan which had returned to normal. The patient received medical treatment (Analgesic, anticonvulsant, corticosteroids and adjuvant measures) which had improved clinically. After a 10-day stay in the emergency room where covid positive patients were received, the patient was transferred to the neurosurgery department for hospitalization. During this period surgical activities were reduced. According to the priority criteria defined for neurological surgeries during the COVID-19 pandemic, our case was evaluated in class A + at this stage. After a long stay of 5 days in hospital, the patient presented an acute respiratory syndrome: respiratory disorders (SapO₂), a persistent fever at 39-40 °C. The neurological examination found: a Glasgow has 11/15, the rest was unchanged. Examination of the respiratory system found: polypnea with flapping of the wings of the nose, pulmonary condensation syndrome. Given the current situation of this pandemic we thought of a diagnosis of COVID-19. The patient was positive for the COVID-19 real-time PCR obtained by nasopharyngeal swab. The patient was isolated in a cabin with a protective mask. The requested chest CT scan showed lesions suggestive of a COVID-19 (Figure 2). The patient was hospitalized at the CTE where he received medical treatment (Plaquenil, Azithromycin, Lovenox, Genesvit, analgesic). After being hospitalized for 17 days, the patient was declared cured and returned with a slightly improved state of consciousness. On examination he had a Glasgow score of 13/15, left hemiplegia. He was reclassified as A ++ and underwent subtotal tumor resection with histological study which came back in favor of Glioblastoma (figure 3). The control CT scan showed a tumor residue with postoperative edema (Figure 4). Due to the covid, the patient was unable to carry out his radiotherapy sessions; he died 4 months later.



Fig 1: IRM cérébrale: montrant un processus lésionnel temporal droit



Fig 2: Scanner thoracique montrant des lésions de covid-19



Fig 3: Scanner cérébral de contrôle

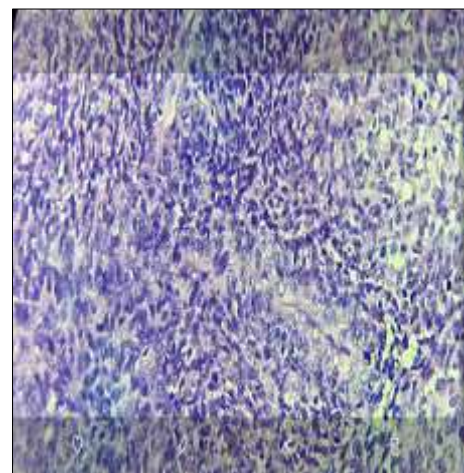


Fig 4: Examen anatomo-pathologique montrant un Glioblastome

Discussions

Glioblastoma is a primary malignant brain tumor in adults that progresses aggressively with a median survival of less than 2 years. Half of all patients with glioblastoma are at least 65 years old as in our case [6]. Populations are aging around the world. The Japanese Society of Gerontology and the Japanese Society of Geriatrics have suggested that the age of 65 to 74 be considered "before old age" and 75 or

older as "old age", based on the analysis of various data. On the physical and psychological health of the elderly in recent years. However, the survival rate of patients with GB decreases with age [6, 7]. The 2019 new coronavirus (COVID-19) has had a dramatic impact on our ability to provide neurosurgical care to our patient. Indeed, since the Centers for Disease Control and Prevention (CDC) declared the COVID-19 pandemic, national and international organizations have adopted "social distancing" and "containment" to lower the rate of person-to-person transmission of COVID-19 [9]. In Senegal, these methods have been adopted, namely: social distancing, reduction of personnel, compulsory wearing of a mask, the use of hydro-alcoholic gel and compulsory confinement from 7 pm. Hospitals were quickly overcrowded with COVID-19 patients, especially intensive care units, and doctors not specializing in infectious or respiratory diseases, including neurosurgeons, were reassigned to new COVID-19 departments to streamline use Resource. Elective surgical activities, hospitalizations and non-emergency outpatient visits have been gradually reduced [10]. This is the case with our hospital, which is a reference center for patients with COVID-19, where all the services have been reorganized to deal with this pandemic. We have reduced surgical activities and the number of hospital staff. Our patient to see during this period or the presumptive diagnosis of Glioblastoma was made. According to the priority criteria defined for neurological surgeries during the COVID-19 pandemic, our case was evaluated in class A + at this stage. To minimize the risk of him contracting COVID-19 while in hospital, a preoperative assessment was requested externally associated with medical treatment with corticosteroids. This priority class includes patients with intracranial or spinal tumors requiring urgent treatment such as rapidly progressive intracranial hypertension with deterioration of consciousness, compression of the spinal cord, hydrocephalus [11]. Our patient, due to neurological deterioration, returned to the emergency room which is the reception site for COVID-19 patients, then was transferred to us and after a long stay in hospital, he presented with a febrile respiratory syndrome and the sample taken. Had come back positive for COVID-19. Probably it was in the emergency room that he contracted COVID-19. So far to our knowledge, no association of Glioblastoma and COVID-19 has been reported in the literature, this is one of the first cases. After a 17-day stay at the Fann outpatient treatment center where he received medical treatment, the patient was declared cured. He returned with a slightly improved state of consciousness. It is not clear how the virus spreads through the human body outside the lungs [12]. On the one hand, we hypothesize that the symptomatic COVID-19 infection seems to worsen the disorders of consciousness in elderly patients with Glioblastoma. This hypothesis has not been demonstrated but remains supported by a study carried out by Dodier in 2014 on 92 patients aged over 75 years, 33.3% of cases with respiratory pathologies had a predominance of neurological reasons (Disorders of consciousness, confusion, neurological deficit) [13]. On the other hand, we hypothesize that the association of COVID-19 and glioblastoma only worsens the pathology due to the delay in treatment, so the infection with COVID-19 can be considered a factor of poor prognosis of Glioblastoma. According to Osawa [6]. Surgical removal of glioblastoma in the elderly remains controversial. Scott *et al.* [14] in a

retrospective study of 206 patients with glioblastoma aged 70 years or older, they demonstrated that surgical resection, unlike biopsy alone, is an independent favorable factor affecting median overall survival and median progression-free survival, even in the elderly population with glioblastoma. In our study, a delay in surgery was recommended until recovery by Panciani *et al.* in 2020 [15]. Carried out a comparative study of two series: A recent cohort of 5 patients (Suffering from COVID-19 and chronic subdural hematomas) operated on where he had found 4 deaths; compared to a historical series of 142 patients operated on for chronic subdural hematomas in which 5 deaths were noted. Surgery therefore appears to worsen the symptoms of patients with COVID-19 infection. In our case, a delay in surgery was recommended until healing. Delaying surgery could also help to minimize the possibility of transmission between patients, exposure of healthcare personnel and the development of postoperative complications [16]. Our cured patient was reclassified A ++ and benefited from a subtotal tumor resection with histological study which returned in favor of a Glioblastoma. A small randomized study (30 cases) of biopsy versus surgical resection of a malignant glioma in patients 65 years of age or older found that total subtotal or gross resection was associated with a significant gain in survival at 3 months by report to biopsy [17] Delaying surgery could also help to minimize the possibility of transmission between patients, exposure of healthcare personnel and the development of postoperative complications [16]. Our cured patient was reclassified A ++ and benefited from a subtotal tumor resection with histological study which returned in favor of a Glioblastoma. A small randomized study (30 cases) of biopsy versus surgical resection of a malignant glioma in patients 65 years of age or older found that total subtotal or gross resection was associated with a significant gain in survival at 3 months by report to biopsy [17] Delaying surgery could also help to minimize the possibility of transmission between patients, exposure of healthcare personnel and the development of postoperative complications [16]. Our cured patient was reclassified A ++ and benefited from a subtotal tumor resection with histological study which returned in favor of a Glioblastoma. A small randomized study (30 cases) of biopsy versus surgical resection of a malignant glioma in patients 65 years of age or older found that total subtotal or gross resection was associated with a significant gain in survival at 3 months by report to biopsy [17] exposure of health personnel and the development of postoperative complications [16]. Our cured patient was reclassified A ++ and benefited from a subtotal tumor resection with histological study which returned in favor of a Glioblastoma. A small randomized study (30 cases) of biopsy versus surgical resection of a malignant glioma in patients 65 years of age or older found that total subtotal or gross resection was associated with a significant gain in survival at 3 months by report to biopsy [17] exposure of health personnel and the development of postoperative complications [16]. Our cured patient was reclassified A ++ and benefited from a subtotal tumor resection with histological study which returned in favor of a Glioblastoma. A small randomized study (30 cases) of biopsy versus surgical resection of a malignant glioma in patients 65 years of age or older found that total subtotal or

gross resection was associated with a significant gain in survival at 3 months by report to biopsy^[17]. Our patient after the biopsy gained 4 months of life. The treatment policy should be established taking into account the preoperative state of elderly patients with glioblastoma^[6]. We really hope this COVID-19 pandemic ends soon.

Conclusion

We can say that COVID-19 infection delays the management of patients with Glioblastoma. This single case report only suggests a possible association between COVID-19 infection and Glioblastoma. We encourage other authors to share their experiences to confirm our hypotheses and provide therapeutic guidelines. Our thanks and thoughts go out to all colleagues, not just those in the neurosurgical community, who risk their lives to provide the best care for COVID-19 patients.

Competing interests

The authors declare no competing interest.

Authors' contributions

All the authors contributed to this work.

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