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Case Report

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Diagnosis of Frontal Meningioma Presenting with Psychiatric Illness in Hemodialysis Patient A Case Report and Review of the Literature

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Abstract

Meningioma is typically a slowly growing tumor that arises from the meninges. Symptoms depend on the location of the tumor pressing on the nearby tissues. Frontal meningioma is often asymptomatic and patient may present with psychiatric symptoms. We report here a case of end stage renal disease on regular hemodialysis presented with symptoms of personality changes, depression, dementia, and increased intracranial pressure due to frontal meningioma confirmed by contrast-enhanced MRI Brain. Meningioma are not uncommon condition in chronic kidney disease on chronic hemodialysis with few case reports, however, such condition needs to be considered in hemodialysis patients presented with abnormal behavior.

Keywords: Meningioma, Hemodialysis, Psychosis

Introduction & Review of Literatures

Meningioma is the most common benign tumor accounting for 13%-26% of intracranial tumors and are known to affect women in a 2:1 proportion in comparison to men [1]. Many of them are slowly growing, incidentally discovered and may not produce symptoms. The clinical symptoms are usually dependent on the anatomic site involved. Occasionally seizures, dementia, trouble talking, vision problems, one-sided weakness, or loss of bladder control may occur [2].

Since they are often benign, the meningioma barely produce clinical symptoms. However, in cases of malignancy, headache, visual disturbances, and nausea and vomiting, seizures, diplopia, hemiparesis, mood changes, confusion may occur due to increased intracranial pressure as well as pressure symptoms [3]. Thalium-chloride emission computed tomography and MRI with gadolinium have high diagnostic yield [4]. Histopathological examination of the tumor cells should always be performed, to confirm the category and subtype of the tumor [5].

Psychiatric symptoms may be the only initial manifestations of meningiomas of the brain in a significant number of cases (21%) occurring in the fifth decade of life. Hence, when a middle-aged person with no history of psychiatric disorder, develops a slowly progressive psychological change, a frontal meningioma should be considered. Headache, Papilledema, and focal neurological signs may develop only when the tumor has reached an advanced stage [6].

Hunter et al.have reported cases of excitement and hallucinosis seen in association with a basal frontal lesion, and psychotic syndromes like hypomania and schizophrenia with tumor encroaching on the third ventricle and adjacent structures. The association between slow growing frontal lobe tumors, anosmia, and personality change is one of the most celebrated in behavioral neurology [7]. In an autopsy study of 7,345 cases from a 20-year period, 76 cases of meningiomas were noted. Meningiomas in the diameter range of 0.5 to 2.7 cm ("small" meningiomas) were significantly associated with extraneural malignancies and chronic renal failure as opposed to those in the diameter range of 2.8 to 10.5 cm ("large" meningiomas) [8].

Few case reports described the incidental diagnosis of meningiomas in chronic hemodialysis patients (CHD). Patient symptomatology ranged from mild restlessness and general fatigue in one case report with frontal meningioma– to severe manifestations as headache, sleep disturbance, marked depressive episodes, and loss of appetite but with non-significant sensory and motor deficits in other reports of dialysis patients with frontal meningioma [4, 8-10]. These abnormalities provide compelling evidence that specialized frontal brain structures such as orbito-frontal cortex and medial prefrontal cortex underlie various cognitive and emotional functions with an implication in mood control, such as regulation of responses to aversive emotional experiences and interpretation of social and emotional cues. Patients of these reports were referred first to psychiatrists and the correct diagnosis was not made until the tumor has grown large and begun to displace the brain, where surgical resection and Gamma knife radiosurgery were carried out successfully for these cases [10].

Herein, we report a case of chronic kidney disease dialyzed in khamis mushayt dialysis clinic (one of the Diaverum AB, Saudi arabia) presented with symptoms of depression, personality changes, which on further investigations, showed space-occupying lesions, which suggests frontal meningioma.

Case Report

A 65-years-old Saudi female patient, who is known to be ESRD, diabetic renal disease on regular hemodialysis , diabetic for 25 years- on treatment using Lina gliptin 5 mg daily, hypertensive for 5 years- on Carvedilol 25 /12 h and with diabetic retinopathy for 6 years for which Laser Photocoagulation Therapy, cataract extraction were done. The patient has also a positive family history, a cousin with brain tumor, and a son with submandibular malignant tumor. The patient started on hemodialysis treatment on Feb 2019, via left radio-cephalic AVF, using post dilution hemodiafilteration modality, 3 times weekly, 4 hours each (Qb: 360 ml/min, Qd: 600 ml/min, and KT/V of 1.5-1.71).

Her latest lab results were :Hb:11.9g/d, MCV: 95, MCH: 33.8, WBC: 7.4, ferritin 548 ng/ml TSAT : 36%, sodium: 138mmol/L, potassium: pre-dialysis 6 mmol/L and post-dialysis 3.9 mmol/L), serum creatinine: 9.7mg/d, Total bilirubin 12 umol/L. Serum Albumin 4 mg/d, AST: 0.28U/L, ALT 0.36 U/L, LDL- cholesterol: 113mg/d, HDL-cholesterol: 23mg/d, HbA1C 8.9%, TSH:3.1 uU/L

On November 2019, the patient's relatives have reported lake of concentration, insomnia, and abnormal behavioral and emotional changes, such as sudden laughing and crying with no obvious reasons. The patient sought psychiatrist advice and prescribed Citalopram 5 mg /d with no improvement. Vasomotor instability was occasionally occurring during her regular dialysis session, a difficult to correct intradialytic hypotension and surging blood pressure up to 240/140 happened in last dialysis session. Neurological examination did not revealed any sensory or motor deficit. CT and MRI of the brain were requested.

Multisilice non-contrast CT study (figure 1) of the brain was done and revealed peri-ventricular smooth hypodenesity; likely small artery disease, a right frontal (14x14 mm) well-defined calcified lesion adjacent to bone; likely calcified meningioma, no areas of axial collection, no area of fresh blood, mild dilatation of the ventricular system, with prominent cortical sulci and other extra axial CSF spaces, and no midline shift normal posterior fossa structures. This carried the impression of white matter disease likely small artery disease and calcified frontal lesion; likely calcified meningioma and mild senile atrophic brain changes

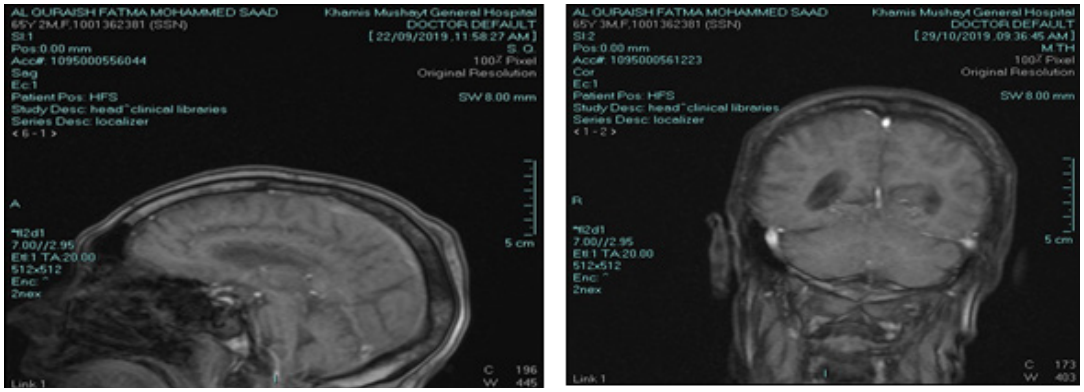

figure 1

MRI with gadolinium (figure 2) showed Right frontal para- falcine extra-axial homogeneously enhancing mass lesion seen; measuring 13x12x10mm,marked motion artifact significantly degrading image quality, bilateral peri-ventricular white matter ischemic changes, normal grey/ white matter differentiation, mildly dilated ventricular system, no shift of midline structures, no areas of fresh blood or blood degradation product signal, and marked sinusitis and mastoiditis .The brain MRI carried the impression of Bilateral periventricular ischemic changes , Brain atrophic changes and Right frontal para-falcine mass, suggestive of meningioma .Anterior cerebral artery aneurysm remains to be excluded by CT angiography.

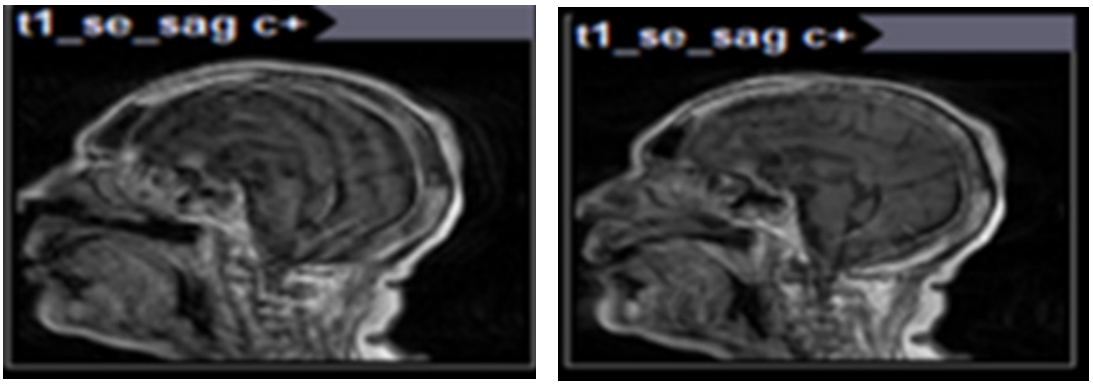

figure 2

Neurological consultation unanimously advocated conservative management and follow-up every 6 months by MRI with contrast as well as watching of severity of patient's symptoms.

Discussion

Meningioma is a slowly growing tumor of the meninges. Ninety percent of meningiomas are benign and mostly occur in the brain. Middle-aged women are more than twice as likely as men to develop meningioma are. Most meningiomas occur between the ages of 30 and 70 years old and rarely occur in children [11, 12].

Patients usually present with vague somatic or undifferentiated psychiatric symptoms that lead to receiving conservative treatment by the physician. Furthermore, some patients present initially with only psychiatry illnesses before the onset of neurological symptoms [13, 14]. Often patients seek treatment from either primary care or tertiary centers, and the majority of them will be prescribed psychiatry medications, if their symptoms match any relevant International Statistical Classification of Diseases (ICD-10) criteria. However, some patients will keep the symptoms to themselves and attend multiple traditional healers with the assumption that the symptoms are supernaturally related seeking traditional healers is common in the community, especially with the first episode of psychotic symptoms [13, 15].

Our patient, with ESRD secondary to diabetic nephropathy , on regular HD treatment for almost one year, presented initially with depressive symptoms, but later developed some atypical symptoms, dementia, and lack of concentration, insomnia, abnormal behavioral changes, Vasomotor instability that could not fit any psychiatric diagnosis. MRI with contrast revealed bilateral periventricular ischemic change, brain atrophic changes, and right frontal para-falcine mass, suggestive of meningioma. Consultation of both neuro-surgery and neuro-medicine came in favor of conservative treatment and need for follow-up of the severity of the symptoms, if any, as well as biannual MRI with contrast. Our surgeon decided to take the conservative approach, however, surgical intervention were successfully performed in dialysis patients with meningioma [16].

Conclusion

Both depression and cognitive impairment are common complications of chronic kidney diseases, yet other possible organic conditions that mimic psychiatric symptoms such as frontal lobe tumors need to be considered. Appropriate approach and early identification of such tumor will be of important value [17].

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