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CASE REPORT



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# Sterile cyst formation after intrathecal stem cell transplant for Parkinson's disease: A case presentation and literature review



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## KEYWORDS

Brain abscess;  
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**Summary** In recent years, fetal or autologous stem cell transplant for the treatment of Parkinson's disease (PD) has been practiced in a few medical organizations. However, the potential complications related to the growth of allograft tissue have not yet been well described apart from case reports. Here, we present a 42-year-old Saudi male who suffered from early onset Parkinson's disease. He sought medical care in China and received autologous intrathecal stem cell transplantation. He did not demonstrate any significant improvement. A few months later, the patient went back to China and underwent fetal cell transplantation into the left hemisphere and a second stem cell transplantation intrathecally. He presented with seizures and had a left frontal brain cyst. The cyst was drained and contained clear fluid. All cultures were negative. He had an uneventful recovery.

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## Introduction

Parkinsonism's disease is a chronic and potentially debilitating neurological disease with no available cure. Transplants of dopamine-rich fetal mesencephalic allografts into the caudate, putamen and globus pallidus have been performed as a potential therapy for Parkinsonism's disease [1–5]. There is *in vitro* evidence that mesenteric stem cell can

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differentiate into neural cells [6] and was shown to protect the brain from Parkinson's disease in animal models [7,8]. However, the safety and potential side effects of this method has not been well documented [9]. Here we present a case of stem cell transplant into the brain that was complicated by the formation of a sterile brain abscess.

## Case presentation

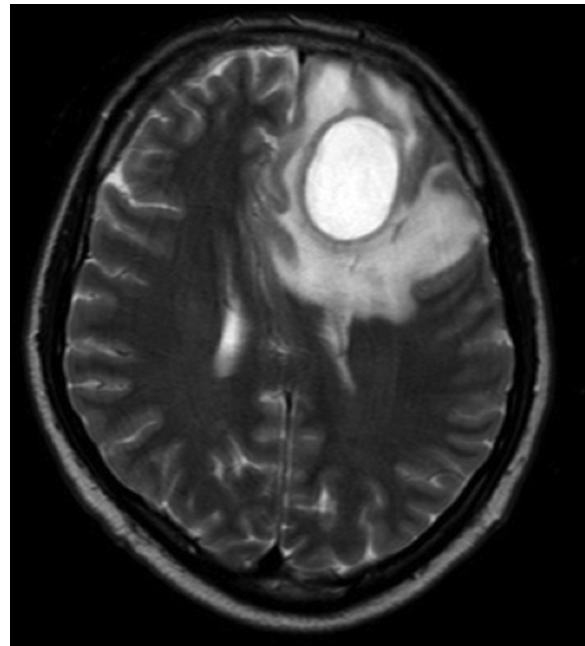
The patient is a 42-year-old Saudi male who suffered from early onset Parkinson's disease for approximately three years and has been treated with increasing doses of dopa agonists and Sinemet® (carbidopa + levodopa). The patient had functioned reasonably well on this treatment with recurrent periods of akathisia interspersed between periods of bradykinesia. The patient went to China and underwent autologous intrathecal stem cell transplantation, which did not result in significant improvement. A few months later, the patient returned to China where fetal cell transplantation was performed in the left hemisphere and a second stem cell transplantation was performed intrathecally. Subsequently, his symptoms improved, but he continued to be treated with the same medications. On the day of admission, the patient had generalized tonic clonic convulsions with confusion. When he reached the emergency room, he had recovered back to his baseline state.

## Physical examination

The patient was afebrile. Vital signs were stable. Cranial nerves examination was within normal limits. He had a diffuse Parkinsonian face; otherwise, his motor power and sensations were intact. Extraocular movements were full, and there was no bradykinesia. There was no tremor, but he had slight rigidity. He could walk with a typical Parkinsonian gait. Reflexes were symmetrical, and cerebellar and sensory examinations were unremarkable.

## Laboratory and radiographic data

The patient's WBC count was  $9.1\text{K}/\text{mm}^3$ , hemoglobin was  $14.1\text{g}/\text{dl}$ , hematocrit was 40%, BUN was  $11\text{mg}/\text{dl}$  and creatinine was  $0.8\text{mg}/\text{dl}$ . His electrolytes were normal. His random blood sugar was 87. Blood levels of calcium, phosphorus and magnesium were normal. MRI of the patient's brain revealed a large collection of fluid in the left frontal lobe, which measured  $3.8\text{cm} \times 2.7\text{cm}$  with



**Figure 1** MRI of the brain indicating the collection of a large amount of fluid in the left frontal lobe and right-sided midline shift and a substantial mass effect on the left lateral and frontal lobe of the right lateral ventricle.

a substantial adjacent vasogenic edema measuring  $8.5\text{cm} \times 5.4\text{cm}$ . There was a 1.1 cm right-sided midline shift and substantial mass effect on the left lateral and frontal lobe of the right lateral ventricle (Fig. 1).

## Hospital course and follow-up evaluation

The patient underwent an aspiration of the brain lesion, which showed clear fluid. The cytology of the fluid revealed macrophages and lymphocytes. Routine cultures, fungal and mycobacterial cultures were all negative. The patient responded and was discharged home. Ten months later, a follow-up MRI showed that most of the abnormality involving the superficial and deep aspects of the left frontal lobe had resolved (Fig. 2).

## Discussion

In the current report, we presented a case of a patient with Parkinson's disease who developed a brain cyst after autologous and fetal intrathecal stem cell transplantation. Transplant of dopamine-rich fetal mesencephalic allografts is a potential therapy for Parkinsonism's disease [1–5]. The patient had referred himself to undergo this research protocol. The use of fetal dopaminergic cell transplantation may provide very long-term

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