Volume 10 • Number 3 • September 2019 • em00727

JOURNAL OF CLINICAL AND EXPERIMENTAL INVESTIGATIONS

LETTER TO EDITOR

Tumor Immunized Autologous Natural Killer Cell (NK) Therapy/Compassionate Use

Serdar Baki Albayrak [1], Ayhan Bilir [2], Türker Karancı [1], Emine Tural [3]

[1] Department of Neurosurgery, Istanbul Aydin University, Istanbul, Turkey

[2] Department of Histology and Embryology, Istanbul Aydin University, Istanbul, Turkey

[3] Department of Histology and Embryology, Pamukkale University, Denizli, Turkey

Correspondence:

Serdar Baki Albayrak, Prof. Dr.

Address: Department of Neurosurgery, Istanbul Aydin University, Istanbul, Turkey

Email: serdarbaki@gmail.com

Received: 15.06.2019,
Accepted: 29.06.2019
https://doi.org/10.5799/jcei/5858

Dear Editor,

As well known, diffuse infiltrative pontine glioma (*DIPG*)-despite all available treatment modalities- carries a dismal prognosis with a mean survival of around one year [1]. A four year old boy was referred to me with a radiological diagnosis of DIPG. He was irradiated and a ventriculoperitoneal shunt (VPs) was inserted in a health facility in Europe. On admission *(seven months after the diagnosis)*, patient was tracheostomized, conscious, quariparetic and with bilateral abducens and lower cranial nerve paresis. I decided to operate on the patient in order to debulk the necrotic pontine mass and to verify the radiological diagnosis histopathologically. Additionally, I planned to co-culture the tumoral cells with the natural killer (*NK*) cells isolated from the peripheral venous blood to investigate the immunization and potentiation of autologous NK cells against glioma cells in vitro after the ethical committee approval was obtained from the Istanbul Aydin University. In January 2019, pontine mass was partially removed via telo-velar approach under neurophysiological monitorization with no additional post op deficits and the unilateral abducens nerve recovery. Tumor specimens were sent to the tissue culture labs and the cell culture procedures were carried out meticulously. Meanwhile, routine histopathological evaluation reported the pontine lesion as DIPG (*Grade 4 astrocytoma*) officially.

Tumor cells were cultivated successfully following serial tumor cell culture passages and tumor cells along with the tumor lysate were co-cultured with the isolated autologous NK cells two months after the surgery. Subsequently, tumor immunized NK cells were separated and were cultured separately. Within this period, patient deteriorated both because of the increased pons edema, decompensated hydrocephalus and concomitant pulmonary influenza B infection.

I placed another VPs and patient was internalized into pediatric intensive care unit (*PICU, April 2019)*. Following anti-viral therapy, resolution of hydrocephalus and respiratory support, patient's level of conscious improved with a limited cooperation.

With the approval of the clinical trial by the Republic of Turkey, Ministry of Health, we administered autologous NK cells via intravenous route on the 15th and 23rd of May.

In each trial, we administered *300.000 NK* cells in 50 cc serum physiologic solution in 30 minutes with no early or late adverse reactions including infection, anaphylaxis, thrombosis, etc. until this date. A week later, post-trial cranial CT scan demonstrated no increase in pons edema, *-on the contrary-* slightly more discrete borders in the tumor necrosis. **Figure 1** depicts the CT scans (*upper panel; left image is recent and the right one is a week ago*) and the light microscopy of immunized NK cells (*lower panel*).

Application of autologous NK cell therapy in gliomas and most other solid tumors is still a *'no man's land'* and neurosurgeons/clinicians should take the initiative and cooperate closely with the

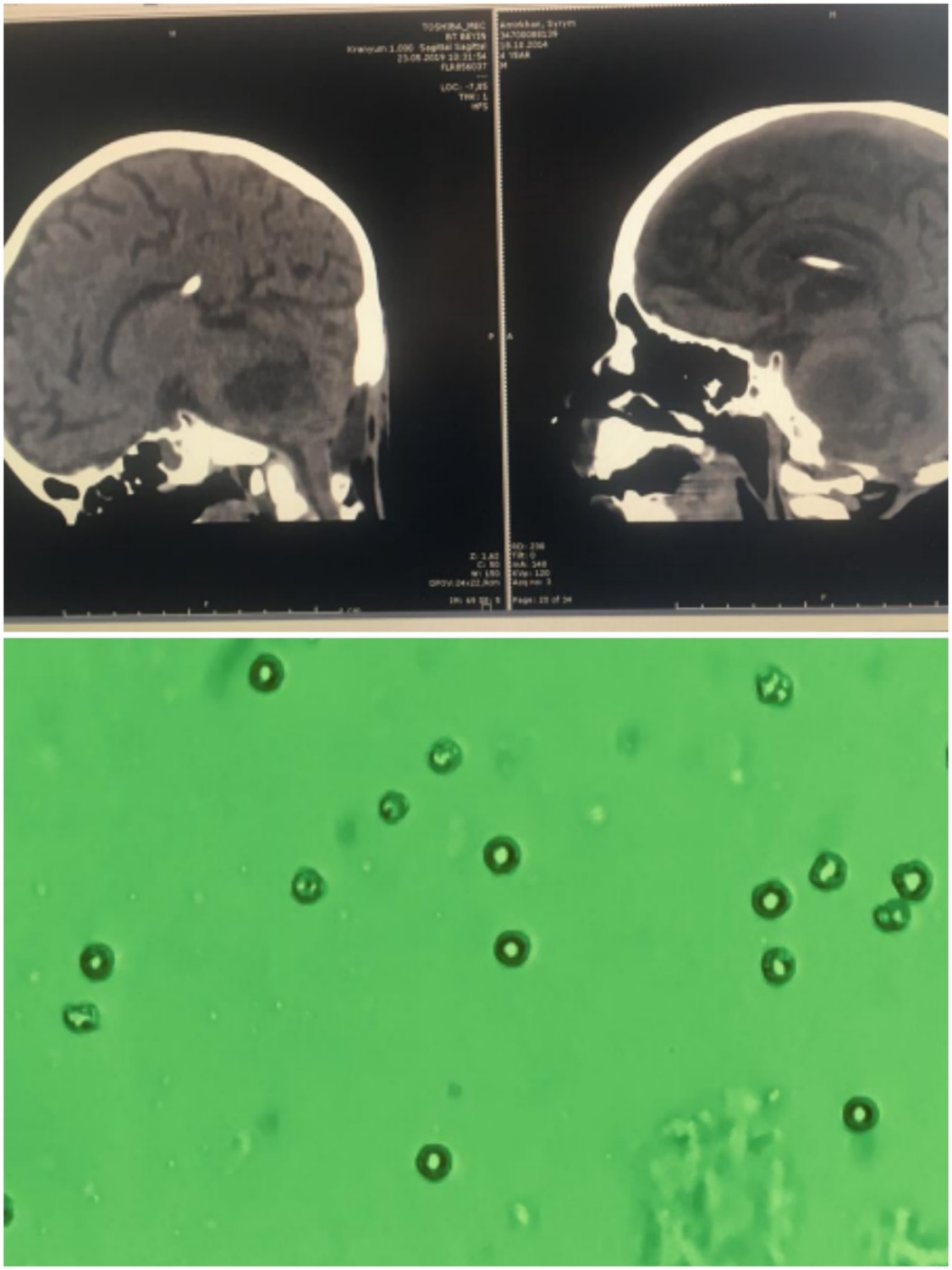

Figure 1. (upper panel; left image is recent and the right one is a week ago) and the light microscopy of immnunized NK cells (lower panel)

basic science researchers for developing definitive cure in gliomas. In this context, I find useful and encouraging to announce our clinical trial.

Declaration of interest: The authors report no conflicts of interest.

Financial Disclosure: No financial support was received.

REFERENCES

1. Pollack IF, Agnihotri S, Broniscer A. Childhood brain tumors: current management, biological insights, and future directions. J. Neurosurg Pediatr. 2019;23:261-273.

