A Case of Complete Recovery From Recurrent Bell's Palsy AfterPeripheral Blood Stem Cell Transplantation

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ABSTRACT

Background

Recurrent Bell's palsy is a rare condition that can affect the ipsilateral or contralateral to the affected side of the primary attack. There is still no consensus on treatment guidelines for recurrent Bell's palsy. Therefore, we report a case of idiopathic recurrent contralateral facial palsy treated with autologous peripheral blood stem cell (PBSC) transplantation.

Case Presentation

A 72-year-old man presented with the sudden onset of right facial weakness, which was contralateral to the affected side of the first episode of facial palsy. The weakness had progressed with difficulty in closing the right eye, drooling the water from the right side of the mouth, and chewing impairment which was consistent with House Brackmann grade IV or moderately severe facial nerve grading system. He had exposure to cold stimulation, and a history of hypertension. He was given G-CSF 10 ug/kg/day for 5 days to mobilize stem cells, followed by apheresis on the 5th day. He did not receive acupuncture treatment. He had a complete recovery in 3 weeks with House Brackmann grade I or normal function of facial nerve.

Conclusion

Peripheral blood stem cell transplantation had a beneficial effect on the complete recovery of this recurrent Bell's palsy and provides a treatment strategy in patients with unilateral facial palsy.

Keywords : Recurrent Bell's palsy, idiopathic, peripheral blood stem cell transplantation.

ABSTRAK

Latar Belakang

Bell's palsy rekuren merupakan suatu gangguan pada bagian wajah ipsilateral atau kontralateral terhadap bagian wajah dengan serangan primer sebelumnya. Sampai sekarang belum ada pedoman pengobatan untuk Bell's palsy rekuren. Karena itu, kami melaporkan satu kasus *facial palsy* rekuren kontralateral terhadap bagian wajah yang terkena sebelumnya, bersifat idiopatik dengan transplantasi stem cell darah perifer otologus.

Presentasi Kasus

Seorang laki-laki berusia 72 tahun dengan kelemahan pada sisi wajah kanan secara mendadak, bersifat kontralateral terhadap serangan episod pertama pada bagian wajah yang terkena. Kelemahan wajah berlangsung progresif dengan kesulitan menutup mata sebelah kanan, air minum yang diminum mengalir keluar melalui mulut sebelah kanan yang terkena, dan gangguan mengunyah, sesuai dengan kategori House Brackmann grade IV atau kondisi berat moderat. Selain riwayat hipertensi, ia juga terpapar dengan rangsangan dingin sebelum serangan. Pemberian pengobatan G-CSF dengan dosis 10 ug/kg/day selama 5 hari untuk memobilisasi *stem cell*, dilanjutkan dengan *apheresis* pada hari ke 5. Ia tidak mendapat pengobatan akupuntur, namun pulih kembali dalam waktu 3 minggu dengan House Brackmann grade I atau kembali normal setelah mendapat transplantasi peripheral blood stem cell.

Kesimpulan

Transplantasi peripheral blood stem cell bermanfaat terhadap pemulihan komplit Bell's palsy rekuren dan memberikan salah satu strategi pengobatan terhadap *facial palsy* unilateral.

Kata Kunci : Bell's palsy rekuren, idiopatik, transplantasi *peripheral blood stem cell*

INTRODUCTION

Recurrent Bell's palsy is a rare condition that can affect the ipsilateral or contralateral to the affected side of the primary attack. (1) It was reported in 7-8% of cases of primary Bell's palsy, (2) associated with hypertension, diabetes, and exposure to cold stimulation. (1–3) Reactivation of herpes virus is another possible cause. (3) However, most cases of recurrent Bell's palsy are idiopathic conditions. (4) There is still no consensus on treatment guidelines. (5) Herein, we report a case of idiopathic recurrent contralateral facial palsy treated with autologous peripheral blood stem cell transplantation.

CASE PRESENTATION

A 72-year-old man presented with right facial weakness, which was contralateral to the first episode of facial palsy, one day before being admitted to our outpatient clinic. The sudden onset of the weakness had progressed with difficulty in closing the right eye, drooling the water from the right side of the mouth, and chewing impairment. He had exposure to cold stimulation a day before the facial palsy attack, suggestive of House Brackmann grade IV or moderately severe facial nerve grading system. The patient had a history of hypertension and hyperlipidemia for 25

years. He was on oral antihypertensive and antihyperlipidemic drugs.

On the first episode of left facial Bell's palsy in September 2020, he had a loss of nasolabial fold and inability to close his eye with effort, which was consistent with severe left facial palsy or House Brackmann grade V. He had a complete facial recovery with no synkinesis. He received stem cell therapy followed by acupuncture.

On physical examination, the blood pressure was 120/80 mmHg, heart rate 56x/min, the face appeared asymmetric with the inability to close his right eye. He was unable to raise his eyebrow and diminished right nasolabial fold compared to the left side of the face, which was in agreement with House Brackmann of Bell's palsy grade IV (Figure 1a). The serologic test of his IgM HSV1, and IgG HSV1 was negative, and CD34+ level was 4.02 cells/μL.

(a)

(b)

Figure 1. (a) The right eye is unable to close, and diminished right nasolabial fold. (b) He had a complete recovery in 3 weeks.

He signed the informed consent form provided before the peripheral blood stem cell transplantation. He was given G-CSF 10 ug/kg/day for 5 days to mobilize stem cells, and followed by apheresis on the 5th day. He took the fixed dose of amlodipine, valsartan 5/80 mg, and fenofibrate 145 mg, for his hypertension and hyperlipidemia, respectively. He did not receive the acupuncture treatment. He had a complete recovery in 3 weeks with House Brackmann grade I or normal function of facial nerve (Figure 1 b).

DISCUSSION

The recurrent facial palsy on the right side of the face, which was contralateral to the previously affected side of the facial palsy 4 years ago was an idiopathic condition and treated successfully with mobilized stem cell transplantation. He had a complete recovery with House Brackmann grade I, suggesting that his facial nerve was fully functioning. He did not receive acupuncture treatment after

stem cell transplantation. On his primary attack, he underwent 15 sessions of acupuncture treatment. Therefore, we believed that the complete recovery was related to the beneficial effects of peripheral blood stem cell (PBSC) transplantation.

The granulocyte colony-stimulating factor (G-CSF) was given to mobilize peripheral blood stem cells followed by leukapheresis. The apheresis products obtained from the same patient were infused intravenously after collection with a cell separator Spectra Optia (SPO, Terumo BCT, Lakewood, CO, USA). Using the flow cytometry analysis, the total number of CD34+ collected was 1.136.672 cells/kg in PBSC. The number of CD34+ count rose to 164.43 cells/μL or increased by 41-fold over baseline after transplantation. Histologically, the myelin sheath of the neuron is damaged in peripheral facial nerve palsy. (6–8) Hematopoietic stem cells, endothelial progenitor cells, and mesenchymal stem cells in the peripheral blood stem cells secrete paracrine factors that can regenerate the facial nerve and maintain nerve continuity. (9–11)

Seffer et al. reported that PBMC-PLT plasma transplanted to a Bell's palsy resulted in morphological and functional recovery. The authors injected 10 ml PBMC-PLT plasma locally to several sites on the right facial palsy. (12) We collected 200 ml of autologous peripheral blood stem cells with a cell separator and infused intravenously. These multipotent stem cells have the ability to promote facial nerve repair and regeneration. Moreover, Ladeby et al. found that the stem cell marker CD34 was upregulated during the early stage in the facial motor nucleus, and decreased sharply toward day 5 following peripheral axotomy. (13) This implies that CD34+ stem cells are incorporated into the facial nerve.

Mancini et al. showed that the recurrent rate of Bell's palsy was 7% and occurred at the older age of 341 patients involved in the study. (1) Our elderly patient had a history of long-term hypertension, and a night wind exposure before the facial attack, which we believed were associated with recurrent Bell's palsy to the primary episode. However, the serologic test for herpes infection was negative. Therefore, the exact cause remains elusive or idiopathic. The meta-analysis of 27 studies involving 1041 patients with recurrent Bell's palsy by Dong et al., demonstrated that either the ipsilateral or contralateral to the affected primary facial episode did not affect the prognosis. (14) In this study, the patient with the contralateral to the affected side of primary Bell's palsy had a complete recovery in 3 weeks after peripheral blood stem cell transplantation.

Conclusion

Peripheral blood stem cell transplantation had a beneficial effect on the complete recovery of this recurrent Bell's palsy and provides a treatment strategy in patients with unilateral facial palsy.

References

1. Mancini P, Bottaro V, Capitani F, De Soccio G, Prosperini L, Restaino P, et al. Recurrent Bell's palsy: outcomes and correlation with clinical comorbidities. Acta Otorhinolaryngol Ital. 2019 Oct;39(5):316–21.

2. Swami H, Dutta A, Nambiar S. Recurrent Bell's Palsy. Med J Armed Forces India. 2010 Jan;66(1):95–6.

3. Zhang W, Xu L, Luo T, Wu F, Zhao B, Li X. The etiology of Bell's palsy: a review. J Neurol. 2020;267(7):1896–905.

4. Cirpaciu D, Goanta C, Cirpaciu M. Recurrences of Bell's palsy. J Med Life. 2014;7(Spec Iss 3):68–77.

5. Zuroff L, Berger JR. A case of idiopathic recurrent inflammatory facial nerve paralysis. Neuroimmunology Reports. 2022 Jan 1;2:100068.

6. Li Y, Kamei Y, Kambe M, Ebisawa K, Oishi M, Takanari K. Peripheral Nerve Regeneration Using Different Germ Layer-Derived Adult Stem Cells in the Past Decade. Behav Neurol. 2021 Sep 9;2021:5586523.

7. Pourmomeny AA, Asadi S. Management of Synkinesis and Asymmetry in Facial Nerve Palsy: A Review Article. Iran J Otorhinolaryngol. 2014 Oct;26(77):251–6.

8. Liston SL, Kleid MS. Histopathology of bell's palsy. The Laryngoscope. 1989;99(1):23–6.

9. Wang Z, Schuch G, Williams JK, Soker S. Chapter 17 - Peripheral Blood Stem Cells. In: Lanza R, Atala A, editors. Essentials of Stem Cell Biology (Third Edition) [Internet]. Boston: Academic Press; 2014 [cited 2024 Mar 26]. p. 227–44. Available from: https://www.sciencedirect.com/science/article/pii/B9780124095038000172

10. Lim H, Zein U, Hariaji I. Abstract MP243: Detection Of Mesenchymal Stem Cells In Mobilized Autologous Peripheral Blood Transplantation From Patients With Ischemic Heart Disease. Circulation Research. 2021 Sep 3;129(Suppl_1):AMP243–AMP243.

11. Naito Y, Nakamura T, Nakagawa T, Iguchi F, Endo T, Fujino K, et al. Transplantation of bone marrow stromal cells into the cochlea of chinchillas. NeuroReport. 2004 Jan 19;15(1):1.

12. Seffer I, Nemeth Z. Recovery from Bell Palsy after Transplantation of Peripheral Blood Mononuclear Cells and Platelet-Rich Plasma. Plastic and Reconstructive Surgery – Global Open. 2017 Jun;5(6):e1376.

13. Ladeby R, Wirenfeldt M, Dalmau I, Gregersen R, García-Ovejero D, Babcock A, et al. Proliferating resident microglia express the stem cell antigen CD34 in response to acute neural injury. Glia. 2005;50(2):121–31.

14. Dong SH, Jung AR, Jung J, Jung SY, Byun JY, Park MS, et al. Recurrent Bell's palsy. Clinical Otolaryngology. 2019;44(3):305–12.