# Feasibility and Early Outcomes of Autologous Hematopoietic Stem Cell Transplantation for Primary Central Nervous System Lymphoma: A Moroccan Single-Center Experience

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## INTRODUCTION

Primary central nervous system lymphoma (PCNSL) is an aggressive extranodal lymphoma. High-dose chemotherapy followed by autologous hematopoietic stem cell transplantation (ASCT) has become a standard consolidation strategy for eligible patients. However, data from North African centers remain limited.

## METHODS

- **Retrospective descriptive** study including **10 patients** with PCNSL who underwent ASCT at Cheikh Khalifa International Hospital, Casablanca, between **January 2024** and **October 2025**.
- **Peripheral blood stem cells** were used in all patients.
- **Mobilization** was performed with **granulocyte colony-stimulating factor** (G-CSF) alone or combined with **plerixafor**
- CD34+ cells were quantified by flow cytometry, and a second leukapheresis was performed when the graft yield was **< 2×10⁶ CD34+ cells/kg**
- All patients received **Thiotepa** (400 mg/m2 à J-6) **– Carmustine** (5 mg/kg à J-5 et J-4) **conditioning**
- Neutrophil engraftment was defined as the first of three consecutive days with an absolute **neutrophil count ≥ 0.5 × 10⁹/L**
- Transplant characteristics, engraftment, early complications, and 100-day transplant-related mortality (TRM) were analyzed.

## RESULTS

- Our cohort included **10 patients**, with a male-to-female ratio of **0.67**
- Mean age at transplantation was **59.6 years (range, 33–72)**
- Mean CD34+ cell dose: **5.7 × 10⁶ cells/kg**

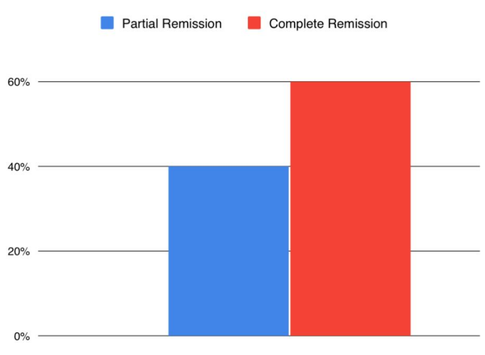


Figure 1: Distribution of patients according to pre-transplant disease status

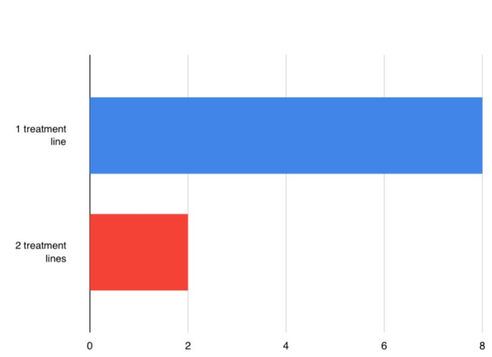


Figure 2: Distribution of patients according to the number of treatment lines

Table 1. Patient Characteristics and Autologous Stem Cell Transplantation Parameters in Primary Central Nervous System Lymphoma

| Characteristics | | | N (/10) |
|---|---|---|---|
| ASCT procedure without cryopreservation | Mobilization regimen | G-CSF alone | 6 |
| | | G-CSF + plerixafor | 4 |
| | Median CD34+ cell dose (×10⁶/kg) | | 5.7 [2–8.1] |
| | Number of apheresis sessions | Two apheresis sessions | 2 |
| | | Single apheresis session | 8 |
| Post-ASCT outcomes and complications | Median neutrophil engraftment (days) | | 12 [10–16] |
| | Median platelet engraftment (days) | | 10 [8–14] |
| | Transfusion requirements (per patient) | Median RBC units | 2 [0–4] |
| | | Median platelet units | 11 [0–24] |
| | Febrile neutropenia | Documented infection | 3 |
| | | No documented infection | 7 |
| | Mucositis | Grade 1–2 | 9 |
| | | Grade 3–4 | 1 |
| | Diarrhea | Present, all grades | 7 |
| | | Absent | 3 |
| Day-100 TRM | | | 1 |

## DISCUSSION

ASCT with thiotepa–carmustine is an established consolidation strategy for primary CNS lymphoma (PCNSL).

Akhtar et al. reported improved overall survival and lower non-relapse mortality with BCNU/thiotepa in older patients, supporting its use in our cohort (mean age, 59.6 years). Our satisfactory stem cell yield also supports the **feasibility** of G-CSF-only mobilization in our setting.

Thiotepa–carmustine provides effective CNS penetration and appears superior to BEAM-based conditioning. ASCT improves disease control while reducing the need for whole-brain radiotherapy and its associated late neurotoxicity (3).

Illerhaus et al. demonstrated the **efficacy** of thiotepa–carmustine consolidation in younger patients with newly diagnosed PCNSL (1). In 603 patients, Scordo et al. found thiotepa-based conditioning to be associated with better survival than BEAM, although with greater early toxicity (2).

The treatment-related death observed in our cohort highlights the significant morbidity of this approach and underscores the need for careful patient selection, multidisciplinary management, and close monitoring during aplasia.

Our experience highlights:

→ ASCT as a **feasible consolidation** strategy for PCNSL in our setting

→ Careful **patient selection** and pre-transplant optimization

→ Close multidisciplinary monitoring to **minimize transplant-related morbidity**

## CONCLUSION

Autologous stem cell transplantation following thiotepa–carmustine conditioning represents a **feasible** consolidation strategy for primary central nervous system lymphoma. However, its potential toxicity warrants careful patient selection, **optimal** pre-transplant management, and close multidisciplinary monitoring to **minimize** morbidity and **improve** post-transplant outcomes.

## REFERENCES

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