Prognostic Impact of 8-Locus HLA Matching in Haploidentical Hematopoietic Stem Cell Transplantation (HSCT): A Single-Center Study from the MENA Region

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Introduction

• Haplo-HSCT has become a prevalent option for patients requiring allogeneic transplants, particularly when a fully matched donor is unavailable

• Human Leukocyte Antigen (HLA) matching can now be evaluated through high-resolution HLA typing, which can assess up to nine distinct HLA loci

• In this report, we reviewed patients who underwent Haplo-HSCT at AUBMC between 2014 and 2024 and who had high-resolution typing available for HLA-A, -B, -C, -DRB1, -DQB1, -DQA1, -DPB1, and -DRB345 and determine their effect on patient outcomes.

Key Objective:

Evaluate whether greater donor–recipient compatibility across eight HLA loci is associated with improved engraftment, relapse, and survival after haploidentical HSCT.

Methods

• We retrospectively studied **148** adults who underwent haploidentical HSCT at AUBMC between 2014 and 2024.
• High-resolution typing included eight HLA loci. Collected outcomes included GVHD, engraftment, relapse, NRM, PFS, and OS.

• Patients with ≤7 mismatches (n=106) were compared with those with 8 mismatches (n=42) using Mann–Whitney U, chi-square, or Fisher's exact tests.
• Survival was evaluated using Kaplan–Meier and log-rank methods; engraftment used competing-risk analysis and Gray's test.

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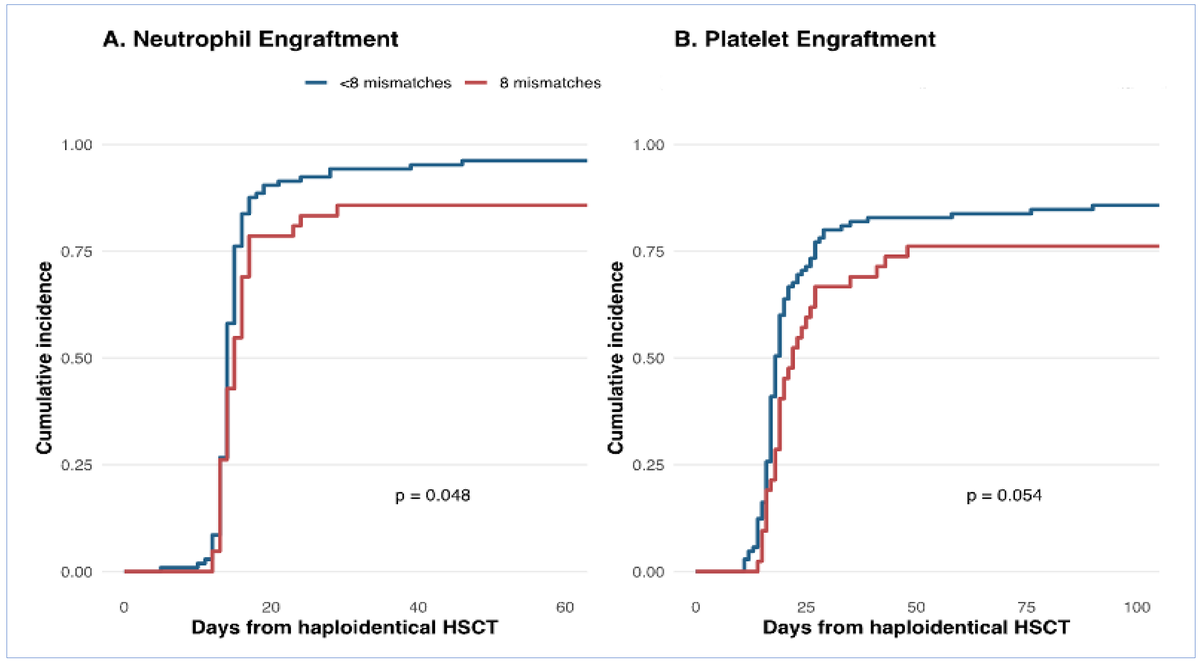
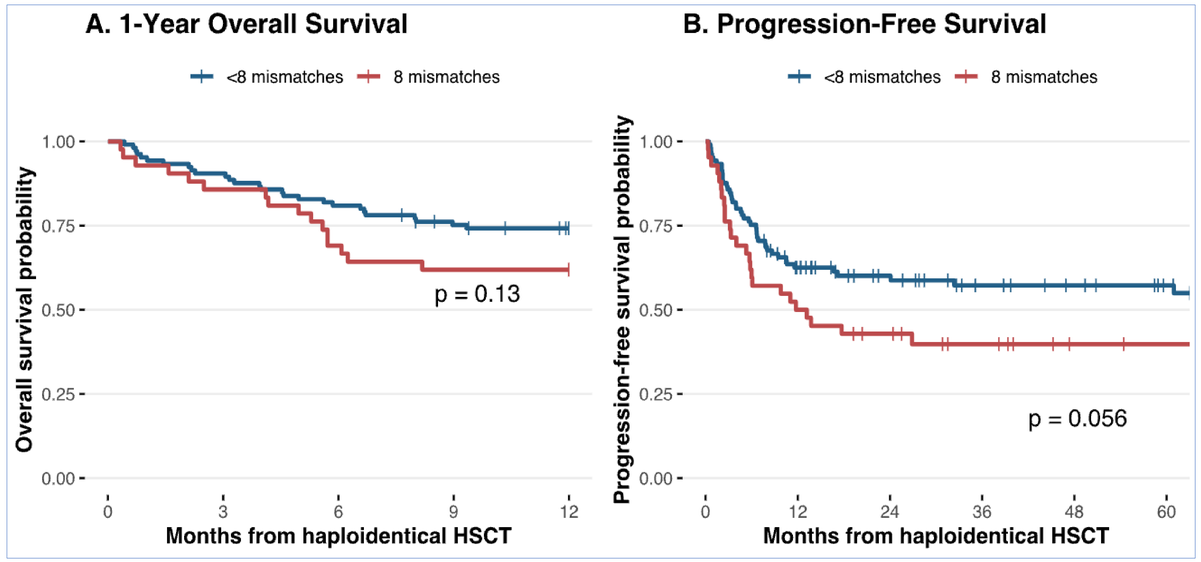
Results





Results

• The cohort included 148 adults: ≤7 mismatches (n=106) and 8 mismatches (n=42). Baseline and transplant characteristics were largely comparable.

• **Lower 2-year relapse incidence**: 20.0% vs 38.1% (p=0.038).
• **Faster neutrophil engraftment**: day +30 incidence was 94.3% vs 85.7% (p=0.048).

Conclusion

• Haplo-HSCT remains a major treatment modality for hematologic malignancies.

• In unadjusted analyses, <8 mismatches across eight loci was associated with better neutrophil engraftment and lower 2-year relapse than 8 mismatches.

• Eight- rather than five-locus matching may improve donor selection and outcomes; larger multicenter studies are needed.

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