The effect of donor age on post-transplant graft outcomes in donation after circulatory death liver transplantation when using normothermic regional perfusion

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Background: Liver transplantation (LT) using donation after circulatory death (DCD) donors poses higher risks of ischemia reperfusion injury compared to donation after brain death (DBD). This phenomenon was traditionally found to be exacerbated by advanced donor age. The introduction of normothermic regional perfusion (NRP), advanced organ recovery technique, has reduced rates of ischemic cholangiopathy and primary non-functioning following transplantation of DCD liver allografts. However, the impact of advanced donor age in DCD LT when NRP is used for organ recovery has not been fully described.

Methods: A single center retrospective study of patients receiving DCD LT using NRP recovery was performed. Patients were grouped based on donor age (≥60 and <60). Post-transplant outcomes included post-transplant intensive care unit (ICU) and total hospital length of stay (LOS), readmission following admission, and allograft function (based on post-transplant aspartate aminotransferase (AST), alanine transaminase (ALT) and bilirubin) were compared between groups. Wilcoxon rank sum test was used to compare continuous variables between groups. Fishers Exact test was used to compare readmission.

Results: Of the 98 DCD donor livers assessed, 59 were used for LT (48 for <60 and 11 for ≥60) . Median post-transplant ICU stay for donors was 4 days (for donor age ≥60 years) and 2 days (for donor age <60 years, p=0.2), Readmission rate was 36% (for donor age ≥60 years) and 19% (for donor age <60 years, p=0.2). Total bilirubin, AST, and ALT following liver transplant during the post-operative course is demonstrated and were not appreciably different between groups (Figure 1).

Conclusions: DCD LT using donor aged ≥60 years did not result in statistically nor clinically relevant difference in short term outcome when compared to donors aged <60 years old. This data supports current practice of using DCD livers from older donors without compromising recipient outcomes. The current findings are limited due to single center data and small sample size and furrther investigation using multi-center registry data is warranted. Expanding the use of liver allografts from DCD donors aged >60 years old is one potential strategy to reduce the organ shortage for patients waiting for liver transplantation.

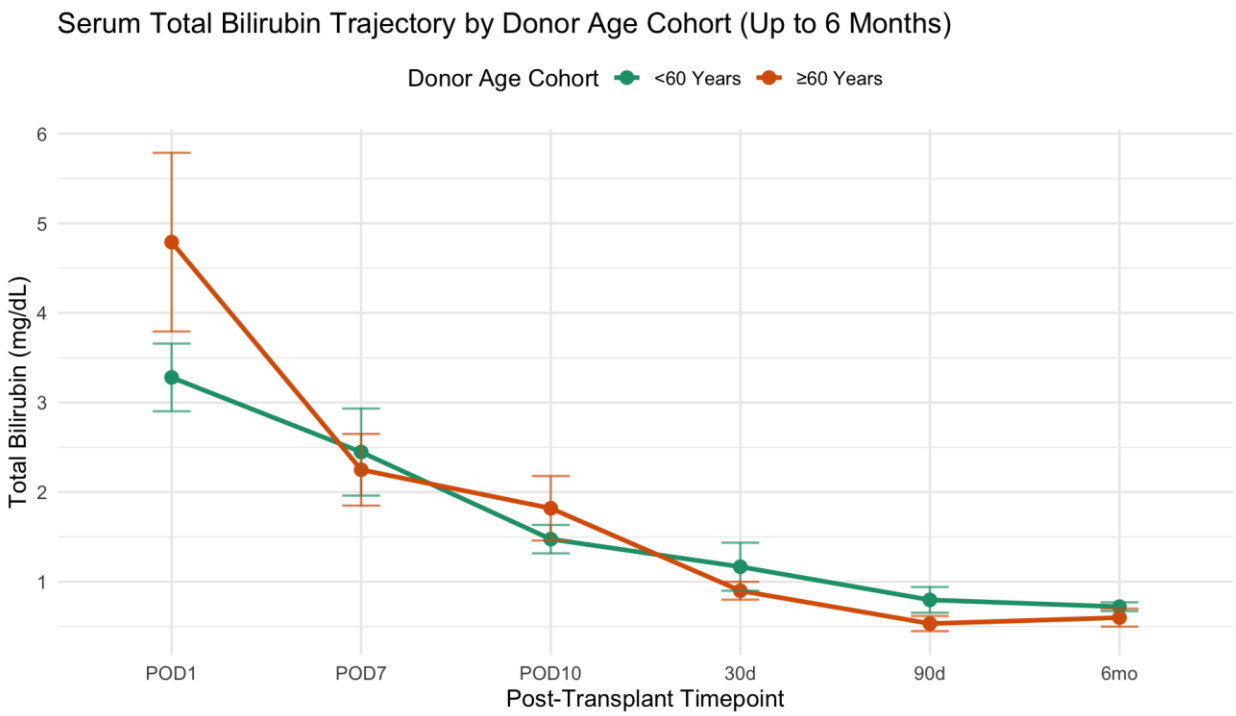


Figure 1: Serum Total Bilirubin Trajectory by Donor Age

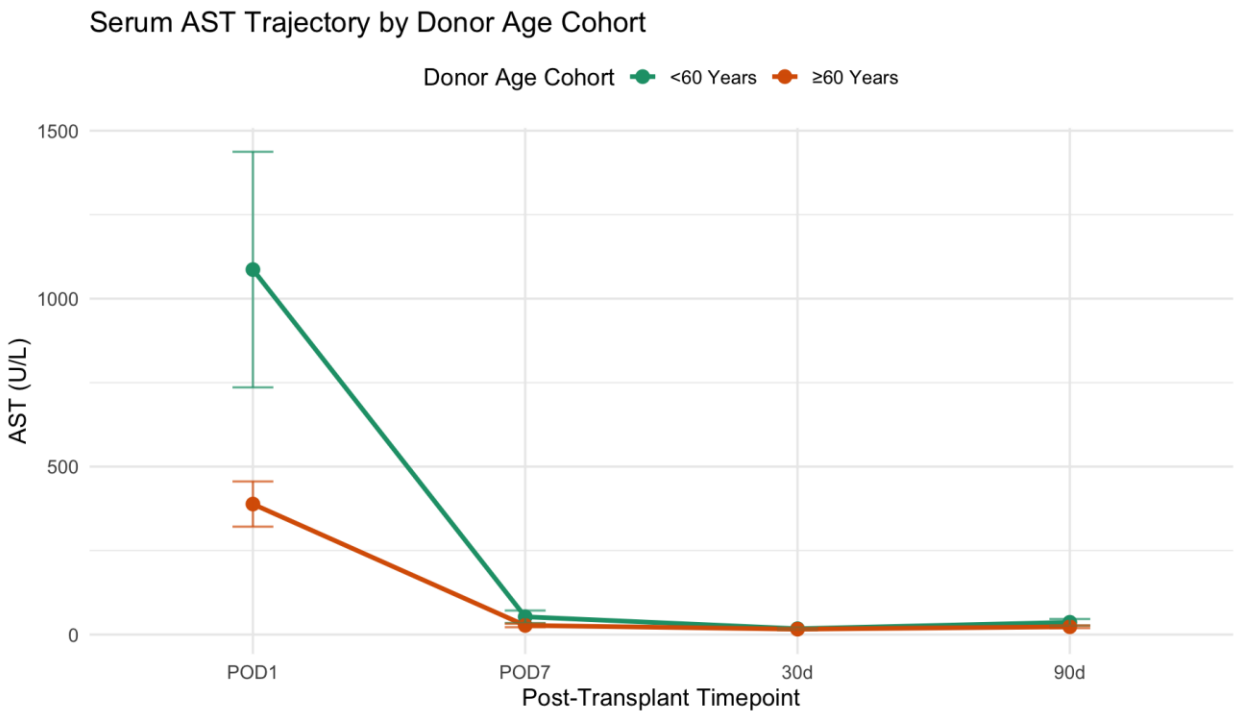


Figure 1: Serum AST Trajectory by Donor Age

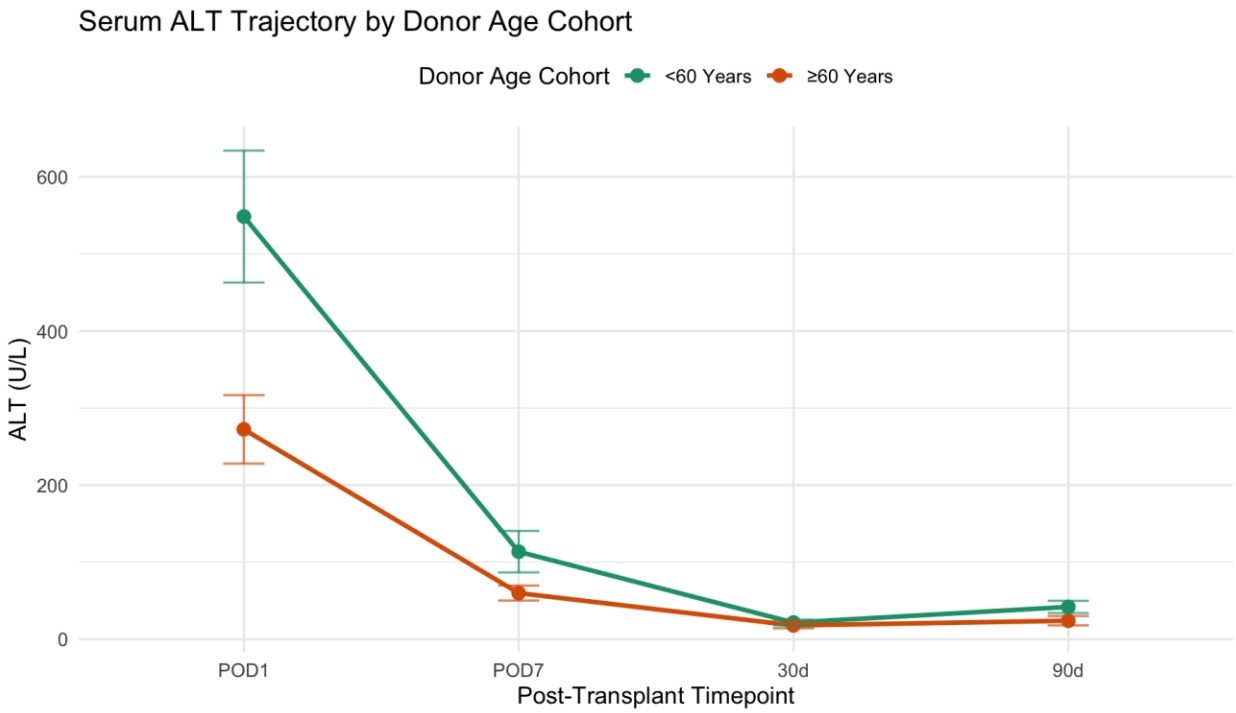


Figure 1: Serum ALT Trajectory by Donor Age