

Publication Brief

Hepatic Hemodynamics and Portal Flow Modulation: The A2ALL Experience.

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INTRODUCTION

In Living Donor Liver Transplant (LDLT) surgery, early graft dysfunction (EGD) or functional graft failure of a small transplant graft (also termed “small-for-size syndrome”) is caused by excessive portal flow. To reduce excess portal flow when a small graft is used, investigators use a variety of techniques to “modulate” or lessen portal flow in order to improve outcomes. Three techniques for portal modulation include splenic artery ligation (SAL), splenectomy, or portal-systemic shunts between the portal vein and the vena cava.

OBJECTIVE

A principal goal of the A2ALL-2 Cohort Study was to study hepatic blood flow and the effect of portal flow modulation on graft outcomes in a setting of increasing use of smaller and left lobe grafts.

METHODS

- Recipients of 274 living donor liver transplant (average age 57 years; 37% women) from nine North American transplant centers were enrolled in the A2ALL-2 Cohort Study between February 2011 and January 2014. These included 233 (85.0%) right lobes, 40 (14.6%) left lobes, and 1 (0.5%) left lateral section.
- Transonic Flowprobes applied to the hepatic artery and portal vein simultaneously with a dual-channel flowmeter measured intraoperative portal vein and hepatic artery flows during 1) dissection of the native donor liver; 2) after reperfusion upon completion of the portal vein and hepatic artery anastomoses in the recipient’s liver; and 3) after each surgical modulation in the recipient.
- A total of 57 portal flow modulations were performed in 52 subjects.

REPORTED RESULTS

Modulation lowered portal pressure in 68% of subjects with inconsistent effects on hepatic arterial and portal flow. A higher rate of graft dysfunction was observed in modulated versus unmodulated subjects (31% vs. 18%; $P = 0.03$); however, graft survival in modulated subjects did not differ from unmodulated subjects after 3 years.

STUDY’S CONCLUSION

The results suggest the need for a study using a prespecified portal flow modulation protocol with defined indications to better identify the effects of these interventions.

TAKE HOME POINTS

This study (one of 41 studies drawn from A2ALL data so far) is invaluable because it states that a primary aim of the A2ALL-2 study was to measure hepatic hemodynamics during LDLT and to describe the use of flow modulation in A2ALL centers to determine the effects of portal modulation on hepatic hemodynamics and clinical outcomes. It states that the reason why it is important to know portal flow after transplant is to ensure that it is not so high that it would cause allograft dysfunction. To know portal flow, one must measure portal flow with Transonic!

Reference:

Emond JC *et al*, “Hepatic Hemodynamics and Portal Flow Modulation: The A2ALL Experience,” *Transplantation*. 2017 Oct;101(10):2375-2384.
TRIAL REGISTRATION: ClinicalTrials.gov NCT01619475 (Transonic Reference TX112316AH).