

## **Graft Inflow Modulation in Living Donor Liver Transplantation with a Small-for-Size Graft: A Systematic Review and Meta-Analysis**

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### **Abstract**

*Introduction:* Small-for-size graft and consequently small-for-size syndrome (SFSS) is an important issue for adult living donor liver transplantation (LDLT). The optimal intra- and postoperative prevention and management strategies for SFSS remain unclear. We aimed to analyse and compare the existing strategies of portal inflow modulation (PIM) and conduct a meta-analysis of studies comparing various PIMs. The primary outcome was the incidence SFSS.

*Methods:* The Google Scholar, Embase, PubMed, and Cochrane Library databases were systematically searched. Both fixed-and random-effects models were used to perform the meta-analysis.

*Results:* Twenty-five studies were selected from a pool of 830 studies, of which 13 compared available surgical techniques between cohorts with and without PIM, and 12 reported outcomes of patients who underwent LDLT and developed SFSS. The incidence rate of SFSS was significantly lower in the PIM cohort than in the non-portal inflow modulation (NPIM) cohort. One-year overall survival (OS) and the re-transplantation rate were significantly better in the PIM cohort than in the NPIM cohort.

*Conclusions:* In LDLT patients diagnosed during the reperfusion period with increased portal venous pressure and/or flow, application of PIM significantly decreased the incidence rate of SFSS and demonstrated significantly better one-year OS.

**Key words:** small-for-size graft, small-for-size syndrome, portal vein pressure, portal vein flow, portal venous pressure modulation, LDLT transplantation