The American Journal of Surgery (2014) 208, 605-618

The American Journal of Surgery®

Association of Women Surgeons

A meta-analysis of complications following deceased donor liver transplant

Lisa M. McElroy, M.D., M.S.[a,b,*], Amna Daud, M.D., M.P.H.[b], Ashley E. Davis, M.S., Ph.D.[b], Brittany Lapin, M.S.[b], Talia Baker, M.D.[b], Michael M. Abecassis, M.D., M.B.A.[b], Josh Levitsky, M.D., M.S.[b], Jane L. Holl, M.D., M.P.H.[a], Daniela P. Ladner, M.D., M.P.H.[a,b]

[a]*Center for Healthcare Studies, Institute for Public Health and Medicine,* [b]*Northwestern University Transplant Outcomes Research Collaborative (NUTORC), Comprehensive Transplant Center, Feinberg School of Medicine, Chicago, IL, USA*

KEYWORDS:
Liver transplantation;
Postoperative complications;
Patient outcomes;
Secondary analysis

Abstract

BACKGROUND: Liver transplantation is a complex surgery associated with high rates of postoperative complications. While national outcomes data are available, national rates of most complications are unknown.

DATA SOURCES: A systematic review of the literature reporting rates of postoperative complications between 2002 and 2012 was performed. A cohort of 29,227 deceased donor liver transplant recipients from 74 studies was used to calculate pooled incidences for 17 major postoperative complications.

CONCLUSIONS: This is the first comprehensive review of postoperative complications after liver transplantation and can serve as a guide for transplant and nontransplant clinicians. Efforts to collect national data on complications, such as through the National Surgical Quality Improvement Program, would improve the ability to provide patients with informed consent, serve as a tool for individual center performance monitoring, and provide a central source against which to measure interventions aimed at improving patient care.

Liver transplantation is a lifesaving and highly complex surgery that is associated with high rates of postoperative complications.[1] Data on graft and patient survival for liver transplant recipients are very effectively collected through the United Network for Organ Sharing, and have provided individual transplant centers with a benchmark for comparison. In contrast, national data on postoperative complication rates are very incompletely collected by the United Network for Organ Sharing. Hence, data available to transplant centers to accurately inform their patients about the postoperative risks of liver transplantation and perform internal quality control are largely limited to single-center and anecdotal reports.

Beyond providing information to liver transplant recipients, more comprehensive data on postoperative complications after liver transplantation would allow for clinicians and transplant centers to compare their complication rates and appreciate whether investigations and improvements of complication rates are necessary. The mitigation of higher than expected

This work is funded in part by AHRQ and NIDDK T32 Training Grants (McElroy 5T32HS78-15, T32DK77662-7).

* Corresponding author. Tel.: +1-312-503-5578; fax: +1-312-503-2777.
E-mail address: lisa.mcelroy@northwestern.edu

Manuscript received February 3, 2014; revised manuscript May 14, 2014

0002-9610/$ - see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2014.06.006

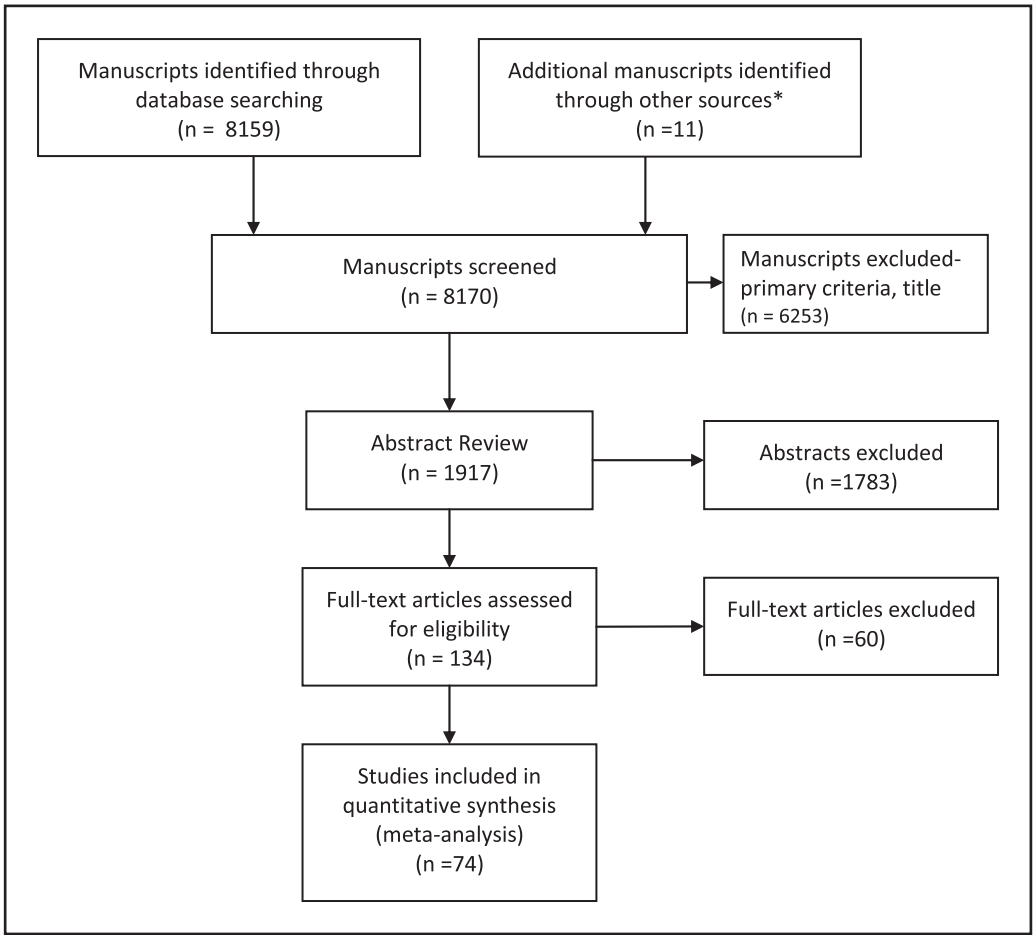

Figure 1 Literature search and exclusion schematic.

postoperative complication rates can lead to outcome improvement and significant cost savings, as complications in liver transplant recipients are more costly than in other surgical populations. For example, pneumonia, which adds an estimated cost of $20,000 for a patient in the general intensive care unit, adds $100,000 additional cost in a liver transplant recipient.[2]

In an effort to summarize the presently available data in the literature, we have performed a review of the clinical literature over the past 10 years to identify rates of the most frequently reported biliary, vascular, hemorrhagic and thrombotic, renal, pulmonary, infectious, gastrointestinal, and cardiac complications after liver transplantation.

Patients and Methods

Data sources

A review of the literature was performed to identify studies that reported the incidence of postoperative complications in deceased donor liver transplant recipients within the first year of surgery. Studies were identified through a search of MEDLINE on October 10, 2012, using the Medical Subject Headings "liver transplantation," "postoperative complications," "myocardial infarction," "pericardial effusion," "anastomotic leak," "renal failure," "respiratory failure," "pneumothorax," "pulmonary edema," "deep venous thrombosis," "pulmonary embolus," "pleural effusion," "postoperative hemorrhage," "cardiac arrest," "arrhythmia," and "intestinal obstruction", which were chosen to reflect the most common postsurgical complications in transplant recipients. A manual search of publication bibliographies was also performed.

Study selection

Institutional review board approval was received before collection of any data. Articles were selected for inclusion if they reported an incidence of postoperative complications in deceased donor liver transplant recipients based on human adult studies over the past decade. Articles were excluded if they were not available in English, were published before January 1, 2002, or originated from a location other than the United States, Australia, Canada, and Europe. Articles focusing on complications related to children, living donor liver transplant, multivisceral, and retransplantation were excluded. Analysis of complications related to immunosuppression, post reperfusion syndrome, and malignancy were excluded. Care was taken to exclude initial reports if follow-up reports were available. Decision