

# Adult Intestinal Transplantation

Cal S. Matsumoto, MD\*, Sukanya Subramanian, MD, Thomas M. Fishbein, MD

## KEYWORDS

- Adult intestinal transplantation • Intestinal transplant indications
- Intestinal transplant outcome • Virtual crossmatch

## KEY POINTS

- Owing to the large lymphoid load and resultant immunologically reactive graft, intestinal transplants pose a direct challenge to the recipient's immune system.
- Intestinal transplants also indirectly challenge the recipient with the compulsory augmented immunosuppression and the inherent complications associated with the higher immunosuppressed state.
- The etiologies of intestinal failure, rehabilitative prognosis, graft type, surgical techniques, nutritional autonomy, and outcomes separate adults and children with regard to intestinal transplantation.

## INTRODUCTION

Adult intestinal transplantation has evolved over the past decades from a rarely performed, immunologically hazardous therapy into a mainstream therapeutic procedure with results that today approach other solid organ transplants.<sup>1</sup> Owing to the large lymphoid load and resultant immunologically reactive graft, the transplanted intestine poses challenges both directly and indirectly on the recipient. Directly, it poses an immediate immunologic confrontation to the recipient immune system, and indirectly on the recipient with the compulsory augmented immunosuppression and the inherent complications associated with the higher immunosuppressed state.

Despite the commonality of the transplanted intestine allograft, adult and pediatric intestinal transplantations have differences in nearly all aspects. The etiologies of intestinal failure, intestinal rehabilitative prognosis, graft type use, surgical techniques, nutritional autonomy, and outcomes are a few of the differences that separate adults and children with regard to intestinal transplantation.

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Medstar Georgetown University Hospital, Medstar Georgetown Transplant Institute, 3800 Reservoir Road, Northwest, 2 PHC Building, Washington, DC 20007, USA

\* Corresponding author.

E-mail address: [cm5@gunet.georgetown.edu](mailto:cm5@gunet.georgetown.edu)

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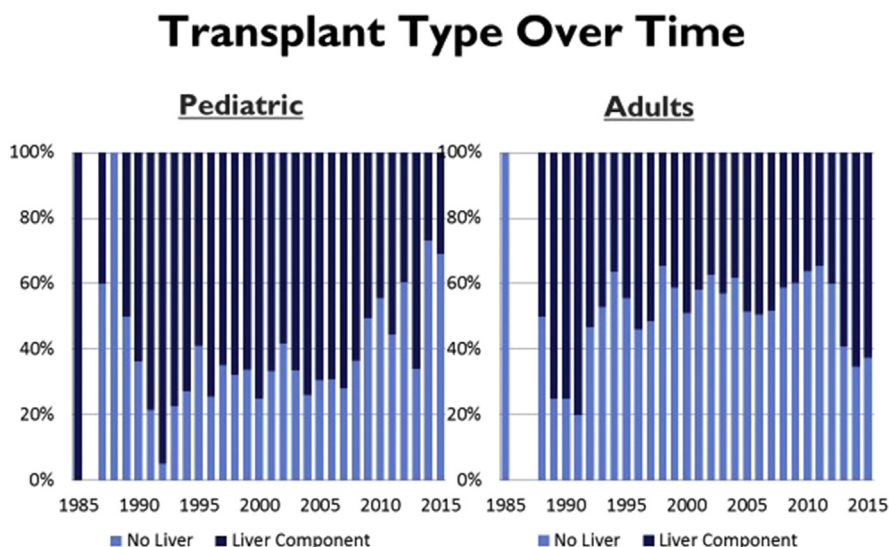
## CURRENT TRENDS IN ADULT INTESTINAL TRANSPLANTATION

Unlike in the pediatric intestinal transplant population, grafts that include the liver have increased in the adult population globally over the past several years according to the latest data published by the Intestinal Transplant Registry<sup>2</sup> (Fig. 1). Not surprisingly, pre-transplant death reported from the Organ Procurement and Transplantation Network/Scientific Registry of Transplant Recipients 2015 Annual Data Intestine Report was notably higher for those patients requiring a liver containing graft at 19.9 deaths per 100 waitlist years as compared with 2.8 deaths per 100 waitlist years for recipients with isolated intestine.<sup>3</sup> Thus, despite the observed overall decreased morbidity associated with parenteral nutrition, largely owing to the establishment and refinement of specialized intestinal care and intestinal rehabilitation centers, pretransplant mortality remains greatest for adult intestine candidates, at 19.6 deaths per 100 waitlist years.<sup>3</sup>

Adult candidates, however, have differing reasons for requiring a liver-containing graft as compared with pediatric candidates. Whereas the majority of pediatric intestinal candidates that require a liver-containing graft suffer from parenteral nutrition-associated liver disease as the basis for their liver inclusion, adult candidates who require a liver-inclusive graft have other conditions such as malignancy or primary end-stage liver disease with complicated portomesenteric thrombosis that necessitates a combined or multivisceral graft for successful liver transplantation.<sup>4</sup> As expected, these adult multivisceral candidates do not suffer from intestinal failure and do not fall under the traditional indications of “failure of parenteral nutrition” as an indication for intestinal transplantation. Attempts to directly compare adult and pediatric indications, surgical techniques, and outcomes cannot be done without understanding the major characteristics between the 2 populations.

### *Adult Intestine Transplant Volume*

Overall, with the exception of 2012, the number of adult intestine transplants has remained relatively steady in the United States in the past decade, ranging from 77 to 92 adult intestine transplant cases per calendar year (median, 85 cases)<sup>5</sup> (Fig. 2). This



**Fig. 1.** International transplant registry data comparing liver inclusive grafts versus no liver graft in the adult and pediatric population. (Courtesy of Robert S. Venick, MD, Los Angeles, CA.)

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