

Small bowel transplantation — the latest developments

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Abstract

Intestinal transplantation has become a routine clinical procedure for selected patients. Over the last 10 years patient survival figures have improved considerably and are now approaching those receiving organs such as liver, lung and heart. Patient selection has improved and immunosuppression has been enhanced by the introduction of lymphocyte modulating antibody therapy combined with less potent maintenance immunosuppression. The indications for intestinal transplantation remain conservative at present and largely reserve this procedure for patients who have life threatening complications of parenteral nutrition or require surgical procedures that make simultaneous or subsequent transplantation advantageous. However, as survival figures improve the indications are beginning to broaden to include consideration of quality of life. Survival after transplantation is approaching that associated with uncomplicated parenteral nutrition and if this trend continues it may replace parenteral nutrition as the treatment of choice for patients with irreversible intestinal failure. This article describes the current indications for intestinal transplantation and the current results of the procedure. Guidelines for referring patients for transplantation assessment and for the management of the sick transplant patient are given. The need to consider referral of patients at an early stage to allow timely assessment for transplantation is also discussed.

Keywords infections; intestinal; multivisceral; NASIT; nutrition; transplantation

A brief history of intestinal transplantation

The earliest significant innovations in the technical aspects of intestinal transplantation are considered to be the canine models developed by Richard Lillehei in the 1950s¹ and 60s,² and the vascular anastomotic techniques of Carrel.³ Graft rejection impeded

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What's new?

- Improved survival figures: 1 year 85%; 5 years 70%
- Survival gap between home parenteral nutrition (HPN) and transplantation is closing
- Quality of life on home parenteral nutrition 'HPN' can be improved by transplantation
- National Adult Intestinal Transplantation (NASIT) Forum — UK forum to discuss all patients before transplantation
- CaMi (Cambridge-Miami) score: first preoperative scoring system to estimate postoperative survival following intestinal transplantation
- It is now a requirement that all suitable patients should be referred (or discussed) for assessment at an appropriate stage before they lose the opportunity of transplantation

progress but following the introduction of a series of powerful anti-rejection agents in the late 1980s,^{4,5} a cluster of reports appeared describing transplantation of part or all the intestine both in combination with other organs and as isolated grafts.^{6–9}

However, long-term survival remained modest at best¹⁰ until the introduction of lymphocyte-depleting induction therapy with agents such as alemtuzumab (Campath-1H) in the 1990s,^{11,12} and the appreciation that thorough preoperative preparation, patient selection and scrupulous postoperative management are of critical importance (Figure 1).¹³ Now, intestinal transplantation can be considered as a routine component of the management of adult and paediatric patients with intestinal failure, and is beginning to replace parenteral nutrition in the long-term management strategy for many of these patients. Currently, children tend to have better survival than adults after 5 years (Figure 2).

The current role of transplantation in the management of intestinal failure

The survival rates of patients requiring home parenteral nutrition (HPN) range between 86–97% at 1 year, 57–83% at 5 years and 43–71% at 10 years.^{14–16} Survival following intestinal transplantation (any combination of organs including small intestine), as reported by the international registry,¹⁰ (which receives details of >90% of all cases world wide) is lower (Table 1) but this survival gap is continuing to close. In the better performing centres,^{17,18} survival figures approximate to those on HPN, particularly for patients given lymphocyte-depleting induction therapy, whose survival at 1 and 5 years has been reported to be as high as 90% and 70% respectively.¹⁷ Patient survival at the largest UK adult transplantation centre in Cambridge has also improved, with 2-year non-oncological survival pre- and post-2007 of 50% and 100% respectively, associated with a 10-fold increase in procedures undertaken per year. The larger of the UK paediatric transplantation centres, in Birmingham, also has improved results, reporting 69% 3-year survival since 1998 and 31% before this.¹⁹ If these improved survival rates are reproduced in other centres and prove a match for those of HPN at 10 years, intestinal transplantation may become the preferred primary treatment for irreversible intestinal failure, rather than being largely reserved for those who respond poorly to HPN. It

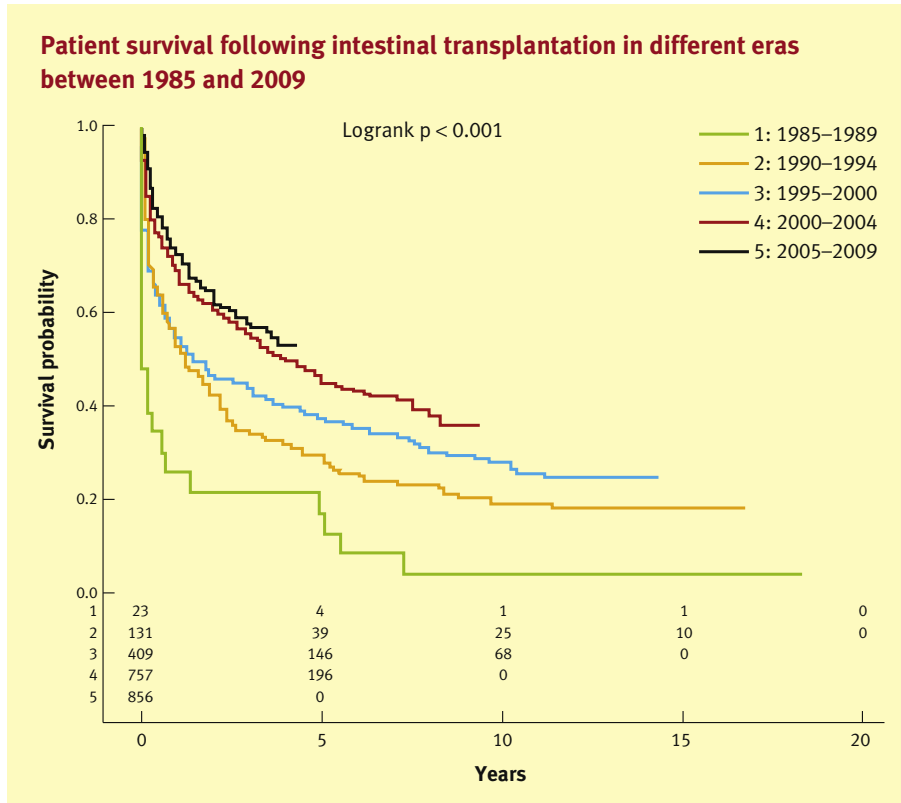


Figure 1

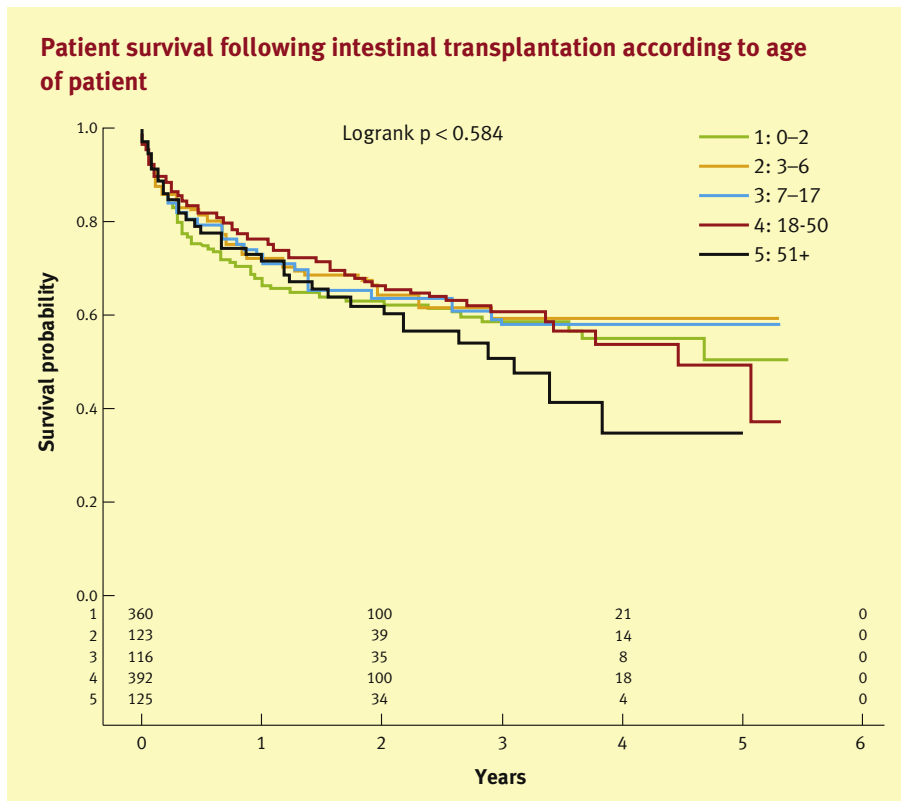


Figure 2

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