FALL TRANSPLANTATION AND SURGICAL RESEARCH AT HENRY FORD HOSPITAL

Common Sense and Surgical Research
Melvin A. Block, MD

CLINICAL EXPERIENCE

Effect of Acute Posttransplant Renal Failure on the Survival of Perfused Cadaver Kidneys
Krishna D. Valjee, MD
Luis H. Toledo-Pereyra, MD, PhD
Stanley G. Dienst, MD
Heung K. Oh, MD
Daniel S. Marks, MD
Pedro Cortes, MD
Cosme Cruz, MD
Godofredo Santiago, MD
Nathan W. Levin, MD

Histocompatibility Testing in Renal Transplantation
Hajime Hayashi, PhD
Jay B. Hunter, BS

Radionuclide Evaluation of Renal Transplant Patients
Daniel S. Marks, MD

Treatment of Uremic Diabetic Patients: Hemodialysis or Transplantation?
Godofredo Santiago, MD
Cosme Cruz, MD
Francis Dumler, MD
Pedro Cortes, MD
Stanley G. Dienst, MD
Sandra Parnell, RN, BS
Maxine Uniewski, RN
Nathan W. Levin, MD

Effect of Donor Pretreatment on the Graft Survival of Human Cadaver Kidneys
Stanley G. Dienst, MD
Krishna D. Valjee, MD
Luis H. Toledo-Pereyra, MD, PhD

Urological Complications in Renal Transplantation
Riad N. Farah, MD
Richard Klugo, MD
Thomas Mertz, MD
Joseph C. Cerny, MD

Continued on Back Cover
Renal Transplantation and Surgical Research at Henry Ford Hospital

The field of renal transplantation has grown considerably in the last two decades in spite of the difficulties in controlling the rejection process and managing the infections associated with severe immunosuppression. Organ procurement, kidney preservation, and histocompatibility testing are some areas that have improved in recent years. But even though surgical transplantation techniques and the postoperative management of the transplant patient have reached satisfactory levels, the basic immunosuppressive regimens are less than ideal. Currently, we are still using the same clinical regimen that was devised more than ten years ago, i.e., azathioprine and prednisone. Antilymphoblast globulin (ALG) or antithymocyte globulin (ATG) in their various preparations are not used by all centers throughout the country. In general, cadaver kidney graft survival remains at best around 70% at one year, even when high doses of ALG are used as the routine immunosuppressive treatment during the first two weeks after transplantation. At two and three years, cadaver graft survival decreases to 60% or less. Thus, better methods of modifying the donor or the graft immune response must be found if long-term survival after transplantation is to improve significantly.

This special issue of the Henry Ford Hospital Medical Journal addresses important subjects in clinical transplantation, such as acute posttransplant renal failure in the perfused cadaver kidney, histocompatibility testing, urological complications, and radionuclide evaluation of the renal transplant patient. Other papers deal with the effect of donor pretreatment on cadaver kidneys, as well as the special problems of treating uremic diabetics. Reflecting the experience of physicians at Henry Ford Hospital, these studies are evidence that acute posttransplant renal failure remains a significant problem in perfused cadaver kidneys, that there are no presently satisfactory methods to predict the response of perfused kidneys prior to transplantation, and that kidneys with normal function after dialysis do as well as those without posttransplant failure. Furthermore, despite established techniques for histocompatibility testing, Hayashi and Hunter in their paper suggest that the development of more precise methods will lead to better correlation between tissue matching and transplantation results. On the other hand, donor pretreatment (discussed in the paper by Dienst, et al) does not offer any significant benefit over control kidneys. It is possible that the timing for administering methylprednisolone and cyclophosphamide is not optimal, since precise timing (24 hours before transplantation) is mandatory in order to prolong graft survival significantly. Immediately after transplantation, radionuclides are of considerable help in assessing kidney function and determining the presence of acute posttransplant renal failure or even rejection. Urological complications, as described by Farah, et al, can also be reduced to less than 5% with careful assessment during recipient work-up and optimal surgical techniques during transplantation. Uremic diabetics are a particularly high-risk group. When they were treated with dialysis and/or transplantation, Santiago, et al found that transplantation was recommended for juvenile diabetics and hemodialysis for the adult diabetic.

Basic areas of transplantation research are also examined in this issue. The effect of intravenous methylprednisolone for kidney transplantation has been talked about for a long time, but no definite conclusions have yet been drawn. In the Valjee and Toledo-Pereyra paper, particular attention is given to the dosage of methylprednisolone needed to obtain the optimal nontoxic dose for auto- and allotransplantation. A new colloid hyperosmolar solution is being introduced for 24-hour hypothermic storage of ischemic canine kidneys. The paper by Chee, et al presents data indicating that colloid solutions which are hyperosmolar can be as good or even better than crystalloid hyperosmolar solutions. Graft pretreatment is another area being studied in transplantation research. The effect of kidney graft pretreatment with Concanavalin A (Con A) is discussed in the paper by Toledo-Pereyra and Simmons. The authors report several modifications in the use of this substance, such as perfusates, temperature, and various manufacturing lots of Con A. Finally, better methods are needed for improving renal preservation techniques, as well as for the overall assessment of the kidney before transplantation. In this regard, the Samuel and Dienst paper describes the results of an oxygen consumption assay performed on canine kidneys.

In summary, this issue of the Henry Ford Hospital Medical Journal is an attempt to cover important and controversial topics in renal transplantation, both from a clinical and a research perspective. The experience of our clinicians and the findings of our researchers here at Henry Ford Hospital can contribute significantly to the scientific knowledge required to treat kidney transplant patients most effectively.

—Luis H. Toledo-Pereyra, MD, PhD
Guest Editor
Common Sense and Surgical Research 4
Melvin A. Block, MD

CLINICAL EXPERIENCE

Effect of Acute Posttransplant Renal Failure on the Survival of Perfused Cadaver Kidneys 5
Krishna D. Valjee, MD
Luis H. Toledo-Pereyra, MD, PhD
Stanley G. Dienst, MD
Heung K. Oh, MD
Daniel S. Marks, MD
Pedro Cortes, MD
Cosme Cruz, MD
Godofredo Santiago, MD
Nathan W. Levin, MD

Histocompatibility Testing in Renal Transplantation 13
Hajime Hayashi, PhD
Jay B. Hunter, BS

Radionuclide Evaluation of Renal Transplant Patients 19
Daniel S. Marks, MD

Treatment of Uremic Diabetic Patients: Hemodialysis or Transplantation? 27
Godofredo Santiago, MD
Cosme Cruz, MD
Francis Dumler, MD
Pedro Cortes, MD
Stanley G. Dienst, MD
Sandra Parnell, RN, BS
Maxine Uniewski, RN
Nathan W. Levin, MD

Effect of Donor Pretreatment on the Graft Survival of Human Cadaver Kidneys 31
Stanley G. Dienst, MD
Krishna D. Valjee, MD
Luis H. Toledo-Pereyra, MD, PhD

Urological Complications in Renal Transplantation 35
Riad N. Farah, MD
Richard Klugo, MD
Thomas Mertz, MD
Joseph C. Cerny, MD

RESEARCH INTEREST

Intravenous Methylprednisolone for Kidney Transplantation 41
Krishna D. Valjee, MD
Luis H. Toledo-Pereyra, MD, PhD

Prolonging Kidney Graft Survival with Concanavalin A: Effects of temperature, perfusate composition, pH, and different manufacturing lots 47
Luis H. Toledo-Pereyra, MD, PhD
Richard L. Simmons, MD

Reevaluation of a New Colloid Hyperosmolar Solution for Hypothermic Storage of Ischemic Canine Kidneys 53
Manuel Chee, MD
Luis H. Toledo-Pereyra, MD, PhD
Richard M. Condie, MD

A Comparison of Kidney Preservation Methods by Oxidative Phosphorylation Studies 57
Devprakash Samuel
Stanley G. Dienst, MD

NOTICES 62