

DEVELOPMENTS IN SURGERY

VOLUME 11

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ORGAN TRANSPLANTATION 1990

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Contents

Foreword by Anthony P. Monaco	xv
Preface by George M. Abouna	xvii
List of contributors	xix

Part One: *Historical Reflections*

1. Reflections on the development of organ transplantation H.M. Lee	1
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Part Two: *Immunology of Organ Transplantation*

2. Cellular and molecular mechanisms of allograft rejection Pekka Häyry	5
3. What does the alloreactive T cell see? J.R. Batchelor, G. Lombardi and R.I. Lechler	11
4. HLA matching and organ transplantation David W. Gjertson and Paul I. Terasaki	17
5. An effective strategy for transplantation of highly sensitized patients F.H.J. Claas, L.P. de Waal, J. Beelen, P. Reekers, P. van den Berg- Loonen, E. de Gast, J. D'Amaro, G.G. Persijn, F. Zantvoort and J.J. Van Rood	29
6. Rapid lymphocyte crossmatching for renal transplantation A.G. White, K.T. Raju, M.S.A. Kumar, E.M. Philips and G.M. Abouna	39

Part Three: *Organ Allograft Rejection*

7. Fifteen-year experience with fine needle aspiration biopsies at the University of Helsinki Pekka Häyry, Eeva von Willebrand and Irmeli Lautenschlager	43
--	----

8. Study of antibody specificity in highly sensitized patients using human monoclonal antibody technology
Ibrahim A. Al-Muzairai, Barbra K. Weber and David A. Power 51
9. Idiotypic-Antiidiotypic antibody interaction and renal transplant survival
I.A. Al-Muzairai, A.A. MacLeod, M. MacMillan, K.N. Stewart and G.R.D. Catto 59

Part Four: *Immunosuppression*

10. Transplantation and blood transfusion in 1990
Robert J. Corry 65
11. Quadruple-drug immunosuppressive induction treatments for immunological high-risk patients in cadaveric renal transplantation using poly- and monoclonal antibodies
H. Schneeberger, S. Schleibner, L. Friedl, M. Schilling, W.D. Illner, D. Abendroth and W. Land 71
12. Sequential combination immunotherapy for cadaveric renal transplantation: OKT3 versus rabbit ATG induction
M.P. Posner, H.F. Henriques, A.L. King, Y. Berlatzky, C. Klosterman, B.A.D. Cook and H.M. Lee 83
13. Multi-organ transplant experience with OKT3 and strategies for use at the University of Cincinnati Medical Center
Timothy J. Schroeder, M. Roy First and Israel Penn 91
14. Cyclosporine withdrawal in renal transplant recipients maintained on azathioprine, prednisone and cyclosporine
M. Kalawi, N.A. Al-Sabawi, M. Samhan, D. Panjwani, M.S.A. Kumar, E.M. Philips and G.M. Abouna 101
15. Early experience with FK 506 in liver transplantation
Robert D. Gordon, Satoru Todo, John J. Fung, Andreas C. Tzakis, Noriko Murase, Ashok Jain, Mario Alessiani and Thomas E. Starzl 109
16. Deoxyspergualin. A novel immunosuppressant: experimental and clinical studies
H. Amemiya, S. Suzuki, K. Ota, K. Takahashi, T. Sonoda, M. Ishibashi, R. Omoto, I. Koyama, K. Dohi, Y. Fukuda and K. Fukao 123
17. Preliminary results with FK 506 in pancreas grafting in a non-human primate model
G. Kootstra, B.G. Ericzon, R. Wijnen, T. Tiebosch, K. Kubota and C.-G. Groth 129
18. The effect of DST on graft outcome — the Turkish experience
S. Sert, H. Gulay, M. Koç and M. Haberal 135

19. Induction of specific unresponsiveness (tolerance) to experimental and clinical allografts using polyclonal antilymphocyte serum and donor-specific bone marrow
Anthony P. Monaco 141
20. Comparison of cyclosporine assays using radioimmunoassay, fluorescent polarization immunoassay and high-performance liquid chromatography
A.G. White, D. Panjwani, M. Angelo Khattar, A.S. El-Deen, M.S.A. Kumar, E.M. Philips and G.M. Abouna 159

Part Five: *Renal Transplantation*

21. Long-term outcome in renal transplantation
H. Brynger 163
22. Ten-year experience with 500 renal transplants
G.M. Abouna, M.S.A. Kumar, A.G. White, M. Samhan, O.S.G. Silva, I.H. Al-Abdullah, M. Kalawi, S. Al-Dadah, N. Al-Sabawi, P. John and E. M. Philips 167
23. Long-term results in recipients of cadaveric renal allografts under cyclosporine therapy
S. Schleibner, H. Schneeberger and W. Land 189
24. Transplantation of single and double kidneys from pediatric donors
David E.R. Sutherland, Rainer W.G. Gruessner, Arthur J. Matas, Goncal Lloveras, David S. Fryd, David L. Dunn, William D. Payne and John S. Najarian 201
25. ABO-incompatible living related donor transplantation
M. Haberal, H. Gulay, S. Sert, G. Arslan, M. Koç and N. Bilgin 203
26. The use of single pediatric cadaver kidneys for transplantation into adult recipients
G.M. Abouna, P. John, M.S.A. Kumar, A.G. White, O.S.G. Silva, E. Shuwaikh, M. Samhan, E.M. Philips and S. Al-Dadah 211
27. Living unrelated donor renal transplantation
S. Sert, H. Gulay, M. Koç and M. Haberal 217
28. Renal transplantation in Tunisia — a three-year experience
H. Ben Ayed, A. El-Matri, T. Ben Abdallah, C. Kechrid, H. Ben Maiz, A. Kheder, F. Ben Moussa, S. Smerlie, M. Ayed, M. El-Ouakdi, K. Ayed and R. Bardi 221
29. Renal transplantation in children
M. Samhan, P. John, M.S.A. Kumar, A.G. White, O.S.G. Silva, E. Shuwaikh, E.M. Philips, S. Al-Dadah and G.M. Abouna 225

30. Kidney donors — long-term follow up
P. John, M.S.A. Kumar, H. Abdul Karim, M. Samhan, N. Al-Sabawi, S. Al-Dadah, T. Eche, O.S.G. Silva, E. Shuwaikh, A. Kobryn, E.M. Philips and G.M. Abouna 233
31. Current techniques for permanent vascular access surgery — experience with 930 procedures
S. Al-Dadah, M. Kalawi, M. Samhan, P. John, M.S.A. Kumar and G.M. Abouna 237
32. Results of 319 consecutive renal transplants from living related and living unrelated donors in Iran
A.J. Ghods, I. Fazel, B. Nikbin, K. Rahbar, E. Abdi, H.N. Ghashti and F. Prooshani 247

Part Six: *Liver Transplantation*

33. Liver transplantation: current status
Robert D. Gordon 253
34. An overview of liver transplantation therapy for children
R. Patrick Wood, Byers W. Shaw Jr, Robert J. Stratta, Alan N. Langnas and Todd J. Pillen 263
35. Current anesthetic management in clinical liver transplantation
Yoogoo Kang 279
36. Risk factors in adult liver transplant recipients
R. Patrick Wood, Byers W. Shaw Jr, Robert J. Stratta, Alan N. Langnas and Todd J. Pillen 289
37. The concept of reduced-size liver transplantation, including split-liver and living related liver transplantation
X.M. Rogiers, J.C. Emond, P.F. Whittington, T.G. Heffron, K.L. King, M.D. Yang and C.E. Broelsch 295
38. Immunological factors contributing to outcome in liver transplantation
Robert D. Gordon 301
39. Transplantation for hepatobiliary malignancies
R. Patrick Wood, Byers W. Shaw Jr, Robert J. Stratta, Alan N. Langnas and Todd J. Pillen 307
40. The diagnosis and management of massive blood loss during liver transplantation
Yoogoo Kang 313
41. Early clinical experience with cluster resection and transplantation for right upper quadrant abdominal malignancy
Robert D. Gordon, Satoru Todo, Andreas G. Tzakis and Thomas E. Starzl 323

Part Seven: *Heart/Heart-Lung Transplants*

42. Lung transplantation: current techniques and outcomes
R. Morton Bolman III 329
43. Heart-lung transplantation at the University of Minnesota
R. Morton Bolman III 337
44. Specificity and sensitivity of the cytoimmunological monitoring
(CIM): differentiation between cardiac rejection, viral, bacterial,
or fungal infection
C. Hammer, D. Klanke, P. Dirschedl, B. M. Kemkes, B. Reichart,
M. Gokel and F. Krombach 345

Part Eight: *Pancreas Transplantation*

45. International Pancreas Transplantation Registry report
David E.R. Sutherland, Kristin Gillingham and Kay C. Moudry-
Munns 353
46. Techniques and experience of pancreatic transplantation with
bladder drainage
Robert J. Corry and John L. Smith 359
47. Pancreas transplantation in non-uremic diabetic recipients
David E.R. Sutherland, David L. Dunn, Kay C. Moudry-Munns,
Kristin Gillingham and John S. Najarian 365
48. Early observation with pancreas transplantation using the bladder
drainage procedure
W.D. Illner, D. Abendroth, H. Schneeberger, S. Schleibner, M.
Stangl, J. Theodorakis, R. Landgraf and W. Land 371
49. Results of pancreas transplantation with irradiated spleen and
segment of duodenum
G. Kootstra, J.P. Van Hooff, H. Peltenburg, C.J. van der Linden, R.
Wijnen, P. van den Berg-Loonen, J.A.M. de Jong, T. Verschueren
and G. Heidendal 377
50. Experience with pancreas transplants from living related donors
David E.R. Sutherland, Frederick C. Goetz, David M. Kendall, R.
Paul Robertson, Kristin Gillingham, Kay C. Moudry-Munns and
John S. Najarian 383

Part Nine: *Islet Cell Transplantation*

51. Islet transplantation — the World Transplant Registry
R.G. Bretzel, B.J. Hering and K.F. Federlin 389

52. Prevention of rejection of islet allografts and xenografts without continuous immunosuppression of the recipients
Paul E. Lacy and David W. Scharp 397
53. Effect of islet transplantation on diabetic secondary complications
R.G. Bretzel 405
54. Does pretreatment of islets of Langerhans with deoxyguanosine improve allograft survival without immunosuppression?
I.H. Al-Abdullah, M.S.A. Kumar, M.S. Al-Adnani and G.M. Abouna 409

Part Ten: *Bone Marrow Transplantation*

55. Current status of allogeneic bone marrow transplantation
Rainer Storb 415
56. New approach to bone marrow transplantation in thalassemia
G. Giardini, G. Lucarelli, M. Galimberti, P. Polchi, E. Angelucci, D. Garonciani, S.M.T. Durazzi, F. Agostinelli, M. Donati, C. Giorgi and M. Filocamo 425
57. Autologous bone marrow transplantation as treatment for bad-risk first remission acute lymphoblastic leukaemia
R.L. Powles, C.L. Smith and S. Milan 429
58. Conditioning regimens in bone marrow transplantation
R. Storb, F. Appelbaum, C. Badger, I. Bernstein, C.D. Buckner, F.B. Petersen, P. Martin, J. Hansen, C. Anasetti, B. Sandmaier, J. Bianco, F. Schuening and E.D. Thomas 437
59. The antileukaemic action of melphalan and total body irradiation in bone marrow transplantation
R.L. Powles, C.L. Smith, C. Tiley, M. Findley and M. O'Brien 443
60. Antifungal prophylaxis with fluconazole in bone marrow transplantation
R.L. Powles, C.L. Smith and S. Milliken 447

Part Eleven: *Xeno-Transplantation*

61. Mass islet isolation from the pancreas of higher mammals: a potential source for islet transplantation in diabetic patients
R.G. Bretzel, B.J. Hering and K.F. Federlin 453
62. The relationship of eicosanoids and complement components to hyperacute xenogeneic rejection and its modification by the PAF-antagonist WEB 2086BS

- David M. Saumweber, Rolf Bergmann, Claus Hammer and Walter Brendel 459
63. Antibody-induced rejection of established pig proislet xenografts in CD4⁺ T cell depleted diabetic mice
J. Dennis Wilson, Charmaine J. Simeonovic and Rhodri Ceredig 469

Part Twelve: *Complications in Organ Transplantation*

64. Occurrence of malignancies in immunosuppressed organ transplant recipients
Israel Penn 475
65. Transmission of cancer with donor organs
Israel Penn 485
66. Long-term experience with surgical repair for transplant renal artery stenosis
M.P. Posner, A.L. King, K.B. Brown and H.M. Lee 491
67. Lymphoproliferative disorders after liver transplantation (OLT): a recent experience
T.G. Heffron, J.C. Emond, J.R. Thistlethwaite, X.M. Rogiers, M.D. Yang, K.L. King and C.E. Broelsch 497
68. Experience with Kaposi's sarcoma in recipients of renal transplants in Tunisia
T. Ben Abdallah, A. El-Matri, C. Kechrid, R. Bardi, F. Ben Hamida, F. El-Younsi, H. Ben Maiz, F. Ben Ayed, Y. Gorgi and H. Ben Ayed 501
69. Urological complications in 510 consecutive renal transplants
H. Abdul Karim, M.S.A. Kumar, M. Samhan, P. John, I.M. Hassan, S. Abdul Basit, E.M. Philips and G.M. Abouna 505

Part Thirteen: *Organ Procurement and Preservation*

70. Preservation of the kidney and other organs into the nineties
G. Kootstra, R. Wijnen and J.G. Maessen 511
71. Clinical experience with liver preservation
Robert D. Gordon and Satoru Todo 519
72. Management of the organ donor
Yoogoo Kang 525
73. The role of the National Kidney Foundation in cadaveric transplantation in Saudi Arabia
S. Aswad, S. Taha, M. Babiker and A. Qayum 531

Part Fourteen: *Ethical, Legal and Religious Aspects*

74. The position of the Transplantation Society on commercialization in organ transplantation J.R. Batchelor	537
75. Ethics and transplantation: an analysis of 'rewarded gifting' John B. Dossetor	539
76. Moral, ethical and medical values sacrificed by commercialization in human organs G.M. Abouna	545
77. Commerce and trade in human organs B.N. Colabawalla	555
78. Some ethical concerns in organ transplantation C.J. Vas	559
79. Islamic view on organ transplantation Mohammed Ali Albar	573
Index of subjects	579

48. Early observation in pancreas transplantation using the bladder drainage procedure

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S. SCHLEIBNER, M. STANGL, J. THEODORAKIS, R. LANDGRAF
and W. LAND

Improved results in pancreas transplantation using the whole organ and a duodenal segment for diversion of exocrine secretion (1, 2) led to the introduction of this technique at the Munich Transplant Centre, too. This technique permits monitoring of the pancreatic exocrine secretion in the urine. There is accumulating suggestion that reduction in urine amylase activity might be an early marker of pancreatic allograft rejection. As an extension to our experience with the duct-occlusion technique we started a controlled study comparing both surgical techniques.

Patients and methods

So far 91 combined pancreas and kidney transplantation and 7 isolated pancreas transplantations have been performed using prolamine for duct occlusion. The bladder drainage technique was used in 16 diabetics, 11 simultaneously and 5 pancreas alone. Clinical results of our experience with the duct-occlusion technique have been published elsewhere (3).

Donor and recipient operation

The whole pancreas with spleen and a short duodenal segment is removed from the donor after complete *in situ* flushing using UW solution. In 4/16 organ procurements we harvested the whole pancreas together with the liver for grafting. Priority of vascular supply was given to the liver, consisting of the celiac axis plus an aortic patch and the portal vein. The whole pancreas graft includes the splenic artery, divided just distal to its origin on the celiac axis, superior mesenteric artery with an aortic patch and the remaining portal vein plus the superior mesenteric vein. After the Kocher maneuver a short duodenal segment is provided using a GIA stapler. The combined removal of liver and whole pancreas requires an arterial and venous reconstruction for the pancreatico-duodenal graft with the donor iliac vessels (4). The pancreatico-

duodenal graft is placed intraperitoneally along the ascending colon with a transrectal incision. Arterial and venous anastomoses were carried out between the reconstruction pancreatic vessels and the recipient's external iliac vessels. For the bladder-duodenal anastomosis we use the two layer side-to-side technique (inner layer: running: 3/0 Vicryl and outer layer: interrupted 3/0 Vicryl).

Immunosuppressive protocol

Since 1984 a quadruple drug induction therapy is routinely used in pancreatic transplantation. It consists of CsA, Aza 'high' dose of steroids and ATG/ALG for a short period of time. Maintenance treatment consists of steroids, CsA and Aza for a period of 6 months, followed by double drug maintenance treatment with CsA and Aza.

More recently we have used a quadruple drug induction therapy with CsA, Aza, 'high' dose of steroids and ATG or OKT3 in a controlled study. The preliminary results were presented in Barcelona (5).

Problems and complications according to different surgical techniques

Using the duct-occlusion technique we are confronted with two major problems. Firstly, the occurrence of a primary irreversible venous thrombosis. Secondly, the development of a pancreatic fistula with the high risk of a secondary infection. The rate of this complication is shown in Table 1. The need of an anticoagulation therapy is required.

Despite of duct-occlusion with prolamine the residual exocrine secretion remains unsolved at the present time.

According to the new technique our clinical results show a high incidence of intraparenchymal graft abscesses with subsequent loss of the pancreatic graft

Table 1. Early complications after simultaneous pancreas and kidney transplantation.

Surgical technique	Venous thrombosis	Local infection		Pancreatic fistula
		Intra-graft	Peri-graft	
Duct occlusion (n = 59)	15% (n = 9)	0	20% (n = 12)	20% (n = 12)
Bladder drainage (n = 11)	0	36% (n = 4)	18% (n = 2)	0

(Table 1). This complication is very common in association with an urinary tract infection.

Results

Patients and graft survival probability rates for 1 year are comparable in both groups (Figures 1 and 2). Long-term results are demonstrable for the duct occlusion technique only (Figure 3).

Summary

Mortality and morbidity rates after pancreas transplantation are low and comparable in both groups taking into account that the number of patients transplanted using the bladder technique is still low and the observation period limited. The 1-year pancreas graft function rate is 60% in both groups. The early phase post-transplant using the duct obliteration in a segmental allograft bears the risk of an irreversible venous thrombosis and the development of a pancreatic fistula with subsequent graft loss. As a consequence of prolamine,

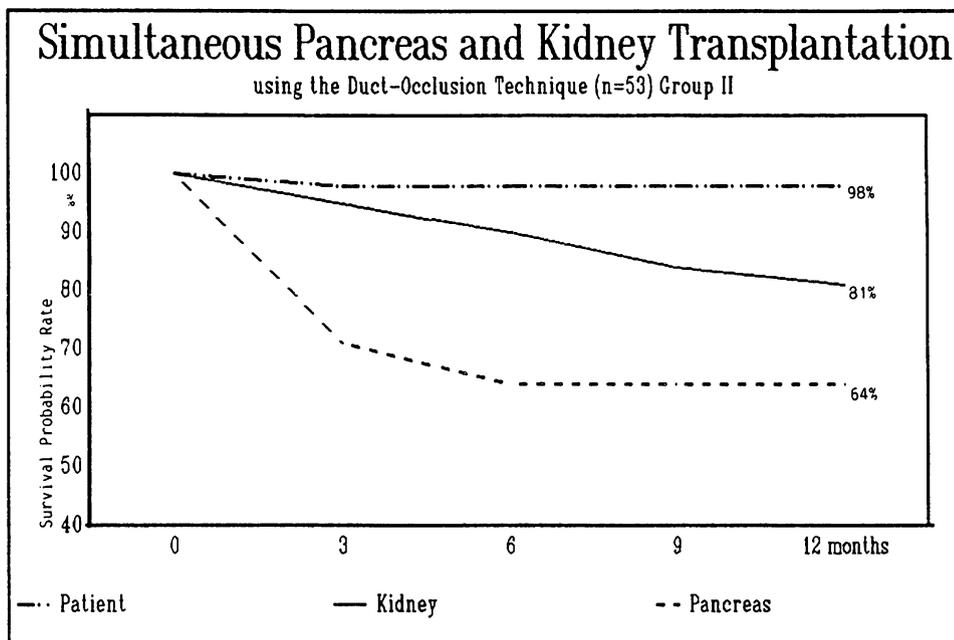


Fig. 1. Patients and graft survival probability in simultaneous pancreas and kidney transplantation using the duct-occlusion techniques ($n = 53$) (Cutler/Ederer formula).

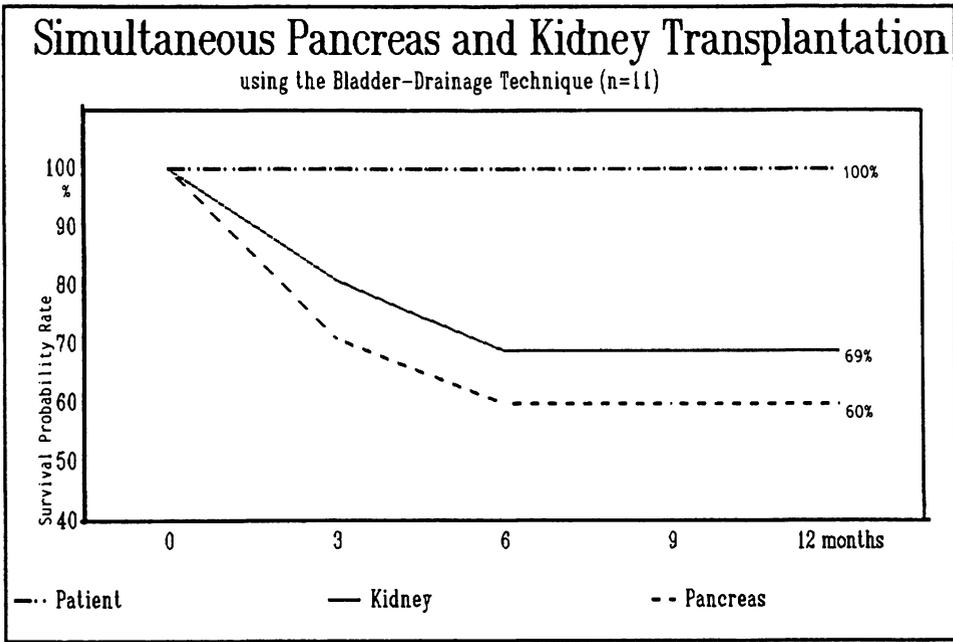


Fig. 2. Patient and graft survival probability in combined pancreas and renal transplantation using the bladder-drainage technique ($n = 11$) (Cutler/Ederer formula).

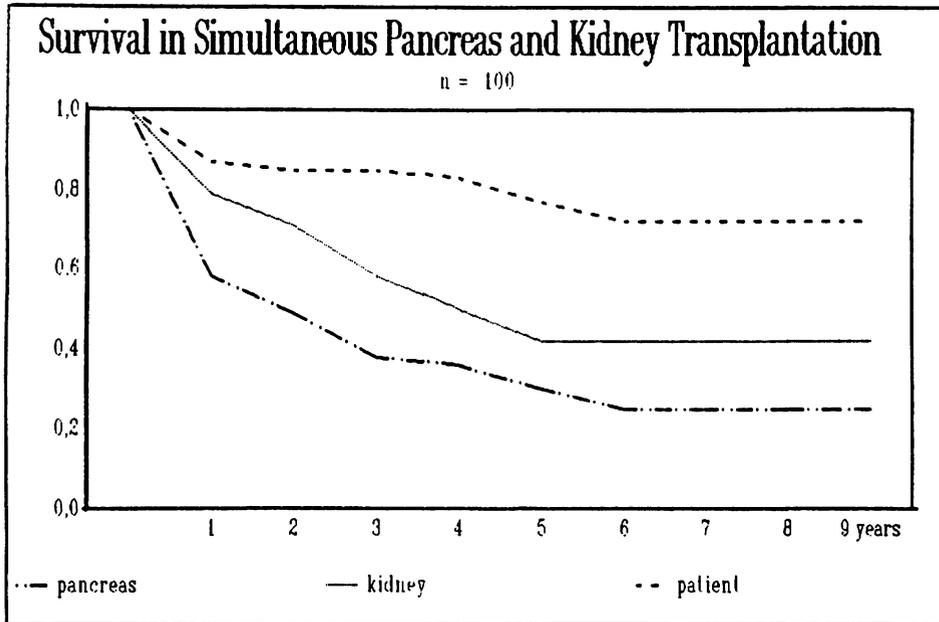


Fig. 3. Long-term results in simultaneous pancreas and kidney transplantation in duct-occluded segmental allografts ($n = 100$) (Cutler/Ederer formula).

the result in the long-run is a vascularized islet cell graft without any exocrine activity and with no risk for the recipient. The induced destruction of exocrine tissue by prolamine is not associated with a deterioration of the endocrine function. Our early clinical observations with the bladder drainage show a remarkably high rate of local infection-complication following urinary tract infection also with subsequent graft loss. Patients with a history of bladder dysfunction as a side effect of long-term diabetic disease might therefore be better candidates for the duct-occlusion technique.

The surgical complication rate is acceptable. Still unsolved is the problem of a transplanted gland with an aggressive enzymatic secretion at the bladder mucosa, as well as for the recipient himself. With this technique postoperative complications may not only develop on the side of the pancreas but also from the duodenal segment. Further experience and long-term results must be gained to find out the best surgical technique.

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