From His Rib

J. David Fachnie
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“So the Lord God caused a deep sleep to overcome Adam, and as he slept He took one of his ribs and filled up the place with flesh. From the rib He had taken from the man, God formed woman…”

These words in Genesis (1) presage the revolution of organ transplantation which is not only sustaining but actually renewing the lives of growing numbers of terminally ill human beings. A transplanted organ is Adam’s rib for the recipient. Henry Ford Hospital provided the option of corneal transplantation prior to 1955 and renal transplantation in 1968. Heart, pancreas, bone marrow, and liver transplantation became available in the 1980s. This section of the Journal features select papers from participants of “The Third Annual Nutrition Symposium: Nutritional Implications of Organ Failure and Transplantation” held at Henry Ford Hospital on November 14, 1989.

In the first paper, “The Physiologic Basis for Nutritional Support in Hepatic Failure” (pp. 229-234), Dr. John Fath from the Division of Trauma and Critical Care Surgery describes the numerous liver functions which are closely related to nutrition. Among these are gluconeogenesis, protein synthesis, lipoprotein manufacture and uptake, and bile salt excretion. Hepatic failure leads to increased hepatic protein synthesis, increased proteolysis, muscle wasting, and decline in serum albumen. Inadequate bile salt excretion results in steatorrhea and vitamin deficiency. Nutritional treatment of hepatic failure includes efforts to replace protein and to reverse the negative nitrogen balance either by standard supplements or with branched-chain amino acid solutions. However, the risk of encephalopathy must also be considered.

Despite vigorous nutritional and pharmacologic intervention, persons with end-stage liver disease (ESLD) are frequently malnourished. Jeanette Hasse, MS, RD, from Transplant Services of Baylor University Medical Center in Dallas, presents the dietitian’s perspective in “Nutritional Implications of Liver Transplantation” (pp. 235-240). Nutritional assessment in ESLD is hampered by the confounding effects of edema and ascites on the cardinal nutritional measure, body weight: lean body mass may actually be lost in spite of weight gain. As described by Hasse, measurements that rely on intact renal function, such as creatinine-height index and nitrogen balance, are unreliable in persons with the hepa-renal syndrome, a complication which is not uncommon in ESLD. Serum visceral proteins are affected by hydration and the nutritional state as well as numerous other factors. One alternative to standard assessment is the subjective global assessment (SGA) modified for patients with ESLD. In SGA, data relative to weight change, gastrointestinal symptoms, and the level of physical capacity are combined with observations of ascites and the state of nutrition. Subjects are ranked as well nourished, moderately malnourished, or severely malnourished. Among transplant candidates at Baylor University Medical Center, 70.6% were moderately or severely malnourished. This article gives an excellent detailed review of nutritional considerations after liver transplantation.

Dr. Warren Kupin and colleagues present “An Overview of Renal Transplantation at Henry Ford Hospital” (pp. 241-245). The program began in 1968, and 762 renal transplants have been performed on 697 patients. Since 1985, about 20% of renal transplants in Michigan have been performed at Henry Ford Hospital. Notable recent changes include quadrupling of the number of living-related gifts and the use of cyclosporine A (CSA) immunosuppression (since 1983). CSA has improved graft survival and permitted withdrawal of glucocorticoids within six to twelve months posttransplant in most patients with consequent reduction of glucocorticoid side effects such as diabetes, obesity, hyperlipidemia, cataracts, muscle wasting, and osteopenia. Increased protein catabolism in the immediate posttransplant phase, an unresolved problem, is presumably due in part to glucocorticoids. The negative nitrogen balance at this time may be ameliorated by increased calories and protein intake (2). A survey of dietitians at renal transplant centers throughout the United States revealed no consensus relative to dietary management of the posttransplant patient (3). However, most recommended a generous protein intake (1.2 to 1.5 g/kg) and individualized prescriptions depending on variations in carbohydrate metabolism, lipid metabolism, energy requirements, and salt and water balance.

Dr. José Goldman et al report on “Allogeneic Whole Pancreas Transplantation in Insulin-Dependent Diabetes Mellitus” (pp. 246-251). Since 1987, pancreas transplantation has been available at Henry Ford Hospital to selected patients with insulin-dependent diabetes mellitus and ESRD who previously have had renal transplantation or presently are in need of it. Those with significant coronary or peripheral vascular disease were not eligible for pancreas transplantation. Eleven patients have received whole pancreas grafts, and results have compared favorably to world experience recorded in the International Pancreas Transplant Registry. Six of ten successful grafts permitted...
patients to be maintained without exogenous insulin treatment. The requirement for immunosuppression therapy limits this treatment to persons who also require immunosuppression for a renal transplant.

These papers illustrate some available organ transplantations but do not describe our experience with cornea, liver, bone marrow, or heart transplants. Corneal transplants have a success rate of 85%, and topical glucocorticoids are sufficient to prevent rejection in most cases (Dr. S. Steen, personal communication). Liver transplantation began in 1989 and five of the nine recipients are presently doing well (Dr. M. Mozes, personal communication). Autologous bone marrow transplantation was instituted (in 1988) to preserve bone marrow function in patients with relapsed or refractory lymphoma. Forty-seven transplants have been performed; of 20 patients followed for more than one year, 13 are alive and 11 of these are free of disease (Dr. N. Janakiraman, personal communication). Since 1985, 109 hearts have been transplanted at Henry Ford Hospital. One-year survival is 90% and three-year survival is 87% (Dr. T. B. Levine, personal communication). The side effects of obesity and dyslipidemia are common to all transplant recipients who require systemic glucocorticoids, and for heart recipients these metabolic complications compromise graft survival by worsening coronary atherosclerosis (4). Dr. T. Barry Levine and I have recently completed a feasibility study to evaluate the safety and efficacy of a modified very-low-calorie diet in obese heart transplant recipients (paper in preparation). For many recipients of transplanted organs, dietary and life-style modification is essential to long-term survival.

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References