

Transplantation

BRIEF COMMUNICATIONS

LIVER TRANSPLANTATION IN PATIENTS OVER SIXTY YEARS OF AGE^{1,2}

Orthotopic liver transplantation has been considered the accepted form of therapy for a number of end-stage liver diseases for several years (1). Until the early 1980s, the unofficially accepted limit for OLTX candidates was 50 years of age.

Although a recent UNOS report seems to suggest that the survival of older patients with OLTX is poorer than that of the general adult transplant population (2), we have previously reported excellent preliminary results with OLTX in patients over 50 years of age (3). We have now expanded our series to 156 patients over 60 years of age at the time they received their transplant, and the results are reported here. Our study indicates that results after liver transplantation in patients over 60 years of age are comparable to the results obtainable in other age groups and that advanced age per se is not a contraindication to liver transplantation.

Between January 1, 1985 and November 30, 1989, 1475 patients underwent OLTX at the University of Pittsburgh. There were 125 (8.5%) infants (under 2 years of age), 229 (15.5%) children (between 2 and 18 years of age), 965 (65.4%) adults, and 156 (10.6%) seniors (over 60 years of age) (Fig. 1A).

Of the 156 senior patients, 80 were males (51.3%), and 76 were females (48.7%). One hundred fifty-two patients (97.4%) were in the seventh decade of their life, while 4 patients (2.6%) were in the eighth decade. Forty-nine patients (31.4%) were UNOS class 1 (out of hospital) at the time of the operation, 62 (39.7%) were class 2 (in the hospital), 24 (15.4%) were class 3 (in the intensive care unit), and 21 (13.5%) were class 4 (urgent) (Fig. 1B). Of the entire group, 129 patients (82.7%) received one graft, 26 patients (16.7%) 2 grafts, and 1 patient (0.6%) received 3 grafts (Fig. 1C).

The indications for transplantation were: postnecrotic cirrhosis (PNC)* 65 (41.7%); primary biliary cirrhosis (PBC) 40 (25.6%); primary hepatic malignancy (CA) 19 (12.2%); alcoholic cirrhosis (ETOH) 17 (10.9%); primary sclerosing cholangitis (PSC) 6 (3.8%); metabolic disorders (MET) 5 (3.2%); acute hepatic failure (AHF) 2 (1.3%); and miscellaneous (OTH) 2 (1.3%) (Fig. 1D).

Actuarial survival analysis was performed using the 1L module of BMDP/PC, 1988 release (BMDP Statistical Software, Los Angeles, CA) on an IBM-PC compatible microcomputer. Differences were considered significant if $P < 0.05$ and highly significant if $P < 0.01$.

The actuarial survival rates (life-table method) for patients with primary grafts was 71.3% after 1 year and 65.5% after 3 years. By comparison, the adult survival ranges were 78% and 71.4%, respectively (Fig. 2A).

For retransplantations, the senior survival rates were 50% at 1 year and 30.7% at 3 years. By comparison, the adult survival rates were 56% and 43.1%, respectively (Fig. 2B). When the UNOS status was considered, the survival was significantly worse for class 4 ($P < 0.02$) (Fig. 2C).

Of the survivors, 66 (66.7%) are fully functional (status I); 27 (27.3%) are functional with some limitation (status II); 5 (5.0%) are partially disabled and in need of some assistance (status III); and 1 (1.0%) is disabled and needing full-time assistance (status IV) (Fig. 3A).

The senior group had characteristics similar to the general adult liver transplant population, with the exception of age. This includes primary liver disease, male/female ratio, and medical urgency status (UNOS class).

The overall survival for the senior group compared favorably with that of the infant and adult groups. The adult group was used for comparison as a "standard" for survival, while the infants were used as another "high-risk" group. The positive results with the older age population may come as a surprise at first glance, but to us it is clear that the physiological age is vastly more important than the chronological age toward survival. Our oldest recipient was 76 years old when she was given a transplant for PBC, and is still well and an active grandmother at 4 years later. In fact, over the years, the number of transplants in older patients has proportionally increased, compared to those in the adult population, as we have become more confident of achieving good results in this patient population (Fig. 3B).

As anticipated, the survival for the much sicker patients in class 4 was statistically poorer. This is consistent with previous observations of a correlation between preoperative patient condition and survival with OLTX (4, 5).

The preoperative evaluation of the older OLTX candidates is similar to that of the general population, although sometimes it may be more complex, as it is more frequently necessary to study the cardiopulmonary condition in greater detail. But once severe concurrent conditions have been ruled out, the prognosis is as good as that for the general adult population. Many of these patients, especially those with primary biliary cirrhosis, present with advanced hepatic osteopathy that is often the rate-limiting pathology for recuperation after liver transplantation. This is one of the reasons for which we advocate early referral and transplantation for such patients, before the crippling effects of advanced and irreversible bone disease have set in. It is frequently possible and often important to use less-aggressive steroid regimens for immunosuppression in these older patients, in order to avoid worsening of the osteopathy, onset of steroid-dependent diabetes, and cataracts. As in the rest of the surgical population, early mobilization is extremely

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* Abbreviations: AHF, acute hepatic failure; CA, primary hepatic malignancy; ETOH, alcoholic cirrhosis; MET, metabolic disorders; PBC, primary biliary cirrhosis; PNC, postnecrotic cirrhosis; PSC, primary sclerosing cholangitis; OTH, miscellaneous.

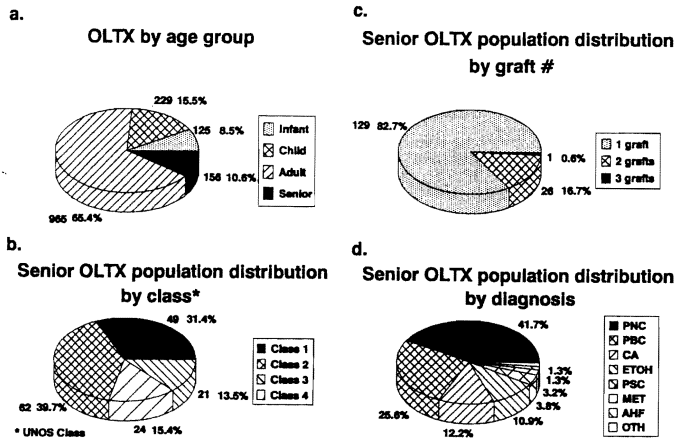


FIGURE 1. (A) OLTX by age group; (B) senior OLTX population distribution by class; (C) senior OLTX population distribution by graft number; and (D) senior OLTX population distribution by diagnosis.

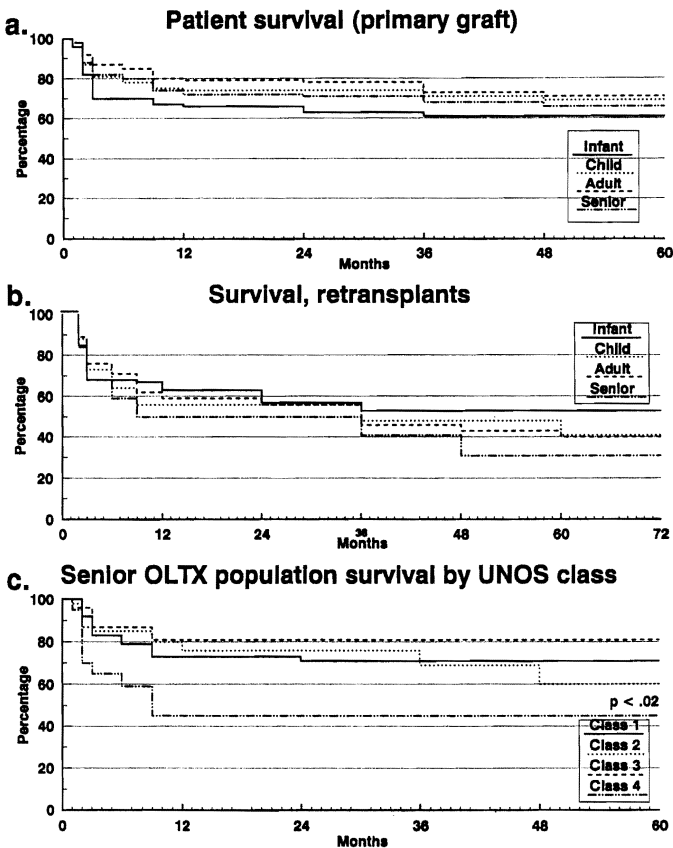
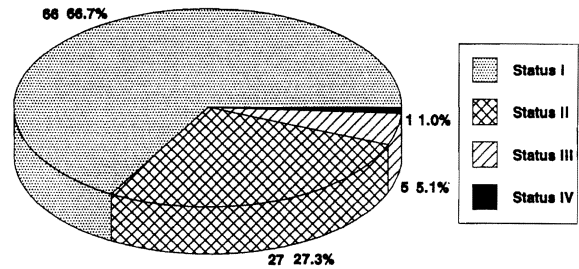


FIGURE 2. (A) Patient survival (primary graft); (B) patient survival (retransplants); and (C) senior OLTX population survival by UNOS class.

important. Otherwise, the postoperative care does not differ significantly from the "standard."

A large percentage of the older patients do recuperate completely or almost completely (93.9% of the survivors in our series have a functional status I or II) and can be active and productive again. Besides assuring them satisfactory quality for the rest of their lives, liver transplantation has the potential to increase the pool of productive population, in an era in which there will be an ever-higher percentage of elderly persons who retire late or reenter the job market.

a. Senior OLTX population: functional status



b. Senior OLTX population by year

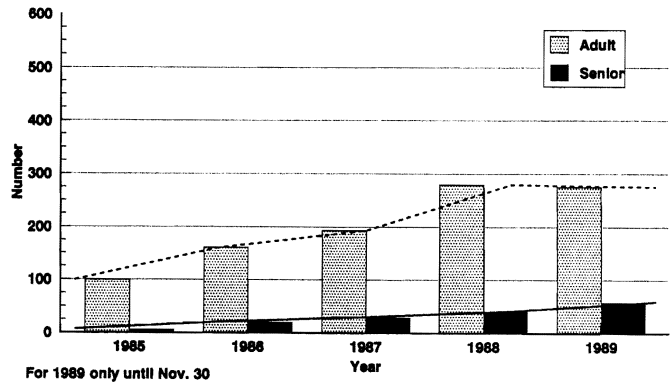


FIGURE 3. (A) Senior OLTX population; functional status; and (B) senior OLTX population by year.

We conclude that advanced age is not a contraindication to liver transplantation. The results after liver transplantation in patients over the age of 60 were comparable to results for the general transplant population. These statistics were in contrast to the recent UNOS report for the calendar year 1988, during which the 1-year mortality rate was 50% for patients 65 years or older (2).

ANDREI C. STIEBER
 ROBERT D. GORDON
 SATORU TODO
 ANDREAS G. TZAKIS
 JOHN J. FUNG
 ADRIAN CASAVILLA
 R. RICHARD SELBY
 LUIS MIELES
 JORGE REYES
 THOMAS E. STARZL³

*The Transplantation Division, Department of Surgery
 University of Pittsburgh School of Medicine
 Pittsburgh, Pennsylvania*

³ Address requests for reprints to: Thomas E. Starzl, M.D., Ph.D., Falk Clinic 5 C, 3601 5th Avenue, Pittsburgh, PA 15213.

DISCUSSION

DR. SHAW (Omaha, Nebraska): Have you noticed any difference in the frequency or severity of rejection episodes in older patients? We certainly noticed that in a series of patients over 65 years of age, for instance, that their hospital course and the number and severity of rejection episodes, seems to be a bit less than the rest of the population.

DR. STIEBER: Their immune system is probably more depressed to begin with. We observed a lower incidence of episodes of rejection, which was not statistically significant, though. On the other hand, they have to spend maybe a few days longer in the ICU on a respirator, about a week longer in the hospital. So that compensates a little bit for the lower incidence of rejection.

DR. WALL: (London, Ontario): In the cardiac workup of your patients are you satisfied with 3-D echoes in assessing ventricular function or do you do angiography?

DR. STIEBER: Well, we usually do the echo and the MUGA scan. If the MUGA scan is abnormal, then we proceed with an angiography. But the angiography is not done as a routine by any means.

DR. WALL: And have you performed liver transplants on any patients who've had angina or who've been on Digoxin to treat congestive heart failure?

DR. STIEBER: No.

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