EDITORIAL

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The Patient Is Anhepatic

Place Your Bets

Orthotopic liver transplantation has become the treatment of choice for a variety of conditions. Standard and new indications, performance of individual centers, and strategies to improve outcome occupy mainstream literature today. The article by Ringe et al. is a refreshing reminder that liver transplantation is not a finished product. We are far from understanding many crucial questions within the realm of liver failure and its immediate and long-term consequences. New avenues need to be explored to find answers for prevention and treatment.

The Hannover group attempted in a pragmatic approach a new strategy to salvage patients with an otherwise low chance of survival by doing a total hepatectomy and accepting a prolonged anhepatic state before a transplant liver was implanted. The underlying conditions, acute liver failure, graft failure, trauma or extensive resections for tumor are diverse. It seems to be impossible to compare these patients in all aspects. They have in common the prolonged state of total hepatectomy and portocaval shunt. Management of liver failure or, as in this series, its complete absence is a challenge for the entire team and has raised numerous questions that had lent themselves to systematic investigations in animal models. Bridging procedures with extracorporal perfusion for acute liver failure using animal livers have been traditionally employed. Recently this approach has received renewed attention in the U.S. New insights in mechanisms and reactions to xenotransplants will result in new approaches in the design of bridging devices. Of immediate interest is whether the addition of extracorporal perfusion to ongoing hemofiltration or dialysis can improve outcome.

The anhepatic state appears to be a suitable model for clinical studies of multiorgan failure. This is suggested by Ringe's findings of universal multiorgan failure as the main cause of death in his series, especially in patients not transplanted after hepatectomy. The initial perception of the authors of a "toxic liver syndrome" is described in their early communication. But, it is put into perspective in this extended series: nearly half of the patients with a "toxic liver syndrome" did not respond to hepatectomy. Although one may concede that the severity of the patient's condition and superimposed pathomechanisms have obscured the beneficial effect of hepatectomy, this issue is far from settled. The continuous search for mediators that may precipitate organ dysfunction or the lack of other mediators that may be necessary to maintain organ function will remain a challenge. It does not appear to be helpful to summarize the complex clinical findings in this setting into one term or syndrome with its all too simplistic implications.

Hepatectomy for uncontrollable bleeding especially after liver trauma has resulted in a good outcome in a few cases. Total hepatectomy has shortened the period of profound shock and has decreased the amount of blood transfusions that might otherwise have determined the outcome in cases of desperate attempts to salvage an injured liver.

Obviously the authors did not decide lightly to remove the patient's liver. A desperate situation combined with mature judgment of most skilled and experienced liver surgeons were the undisputed basis for the applied strategy. Beyond that another factor needs to be mentioned — the willingness of European transplant surgeons to share livers for strictly defined highly urgent situations internationally beyond procurement and organ sharing regions. Although not mentioned specifically in this article, the reader is left with the impression that a liver had been available for all patients in time. This confidence based on established collaboration and goodwill may have facilitated the authors' decision to proceed in some cases. A crucial lesson can be learned from Ringe's paper — transplantation has unselfishness on all levels. As physicians, we preach this gospel to donor families and to society. At the same time, bitter organ allocation wars are fought by some individuals for other than unselfish reasons. Help for patients (and surgeons) in this series was made possible by many unselfish members of the transplant community.

The outcome of transplanted patients after total hepatectomy and a prolonged anhepatic phase may seem unsatisfactory if taken out of the context of the emergency situation. It will remain a philosophical question whether to look first and primarily at the successful outcomes or at the failures in this extreme setting. The successful cases have demonstrated first to the entire team involved and now to the readers that unusual ap-

proaches can push the limits of surgery beyond the current practice. Many questions have been raised by the authors themselves, more will be raised by readers. Several issues have already stimulated sound experimentation to resolve questions in this field of acute liver failure and the anhepatic state. The generation of new impetus for research lifts the significance of Ringe's article beyond that of surgical pragmatism and "try your fortune" mentality.

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