

References

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DISCUSSION

DR. WILLIAM A. NEELY (Jackson, Mississippi): At the University of Mississippi Medical Center we manage a substantial number of severely injured patients on our trauma service, and injuries to the liver and the porta hepatis are not uncommon. However, I will limit my remarks to a single case, though we have had an additional patient who required duodenal resection.

The patient was a 26-year-old man who walked into our emergency room after having been involved in a motor vehicle accident where his motor scooter struck the rear of a large truck. He went up under the truck, and he was struck in the abdomen. Struck in the upper abdomen, he felt severe pain, and vomited once.

Physical examination revealed generalized tenderness, with some rigidity and absence of bile sounds. At laparotomy, a long and deep laceration of the left lobe of the liver and repaired. The common duct was severed just distal to the level of the cystic duct, and the head of the pancreas and the duodenum were so macerated that the specific ductal structures could not be clearly identified.

(Slide) Accordingly, we ligated the distal common duct, and performed the resection and anastomosis shown in this slide. The duodenal stump was closed. A partial gastrectomy, a cholecystojejunostomy, a gastroenterostomy, an enteroenterostomy, and a choledochostomy with T-tube were performed as illustrated.

After a month of hospitalization complicated by staphylococcal pneumonia, the patient was discharged. I have seen this patient several times since he was discharged from the hospital.

DR. DAVID B. SKINNER (Chicago, Illinois): I would particularly like to address the difficult problem of the occult bile duct injury. In this paper, we heard that 3 of 7 patients with blunt abdominal trauma had a delay in the diagnosis for up to one year. Five years ago, I was asked to operate on a 27-year-old man who held the same

highly spiritual commitment that Dr. Griffen's patient did, who was bleeding from esophageal varices on several occasions. We had planned to do a portacaval shunt on this man.

At operation, we found a mass behind the head of the duodenum. In exploring this further, a bile lake was encountered. We opened the duodenum and explored the common duct through the ampulla, and found a transection of the duct, with a connection through a biliary fistula in the retroperitoneum, and dilatation of the proximal common duct.

Based on these findings, we changed the operative course, and did a common duct reconstruction to the duodenum. Postoperatively, close questioning revealed that this man had been involved in a motor accident two years before, had suffered blunt abdominal trauma, was observed in hospital for three days, and then discharged. He gradually then showed progressive deterioration of liver function, attributed to alcoholism.

After the common duct reconstruction, he has now gone for five years with no further bleeding, with a reversal of his portal hypertension, and with microscopic reversal of his biliary cirrhosis, confirmed by needle biopsy. The long-term consequences of a missed bile duct injury are, obviously, highly significant, but are reversible even at a later time.

DR. H. HARLAN STONE (Atlanta, Georgia): These wounds present a great challenge. (slide) On reviewing our experience with portal venous injuries, a large number were found to have associated major vascular trauma, such as wounds of the aorta and of the vena cava. These other wounds have required primary attention, so we have preferred to put a circular, noncrushing vascular clamp across the porta hepatis to control the portal venous bleeding until the injury to the aorta or cava has been corrected. As Dr. Cerise has stressed, associated injuries are often the very reason for the patient's death.

With respect to suture of the portal vein, we routinely attempt

a lateral repair. However, there are occasions when this is impossible. Similarly, an end-to-end reanastomosis is out of the question in most cases. In desperation, ligation of the portal vein has been used.

To our amazement, eight of the ten initially subjected to ligation were long-term survivors. Since that time, we have ligated the portal vein in ten other patients, with survival in eight. (slide) This is a portal vein being ligated, as we felt repair was technically impossible by lateral phleborrhaphy. On the eleventh postoperative day, a celiac angiogram demonstrated a reconstitution of the portal vein. Presumably, collateral channels are present in most, if not all, of these patients.

(slide) Nevertheless, because of obstruction to portal outflow, sequestration of blood into the splanchnic bed will occur. The patient then becomes splanchnic hypervolemic, as he develops peripheral hypovolemia. Patients have died of such splanchnic pooling. Since appreciating this particular problem, these patients have been followed closely with either central venous or pulmonary artery pressures in order to maintain a functionally normal peripheral blood volume. This may require the over-transfusion of a volume of blood almost equal to their own normal blood volume. To date, we have remained satisfied with the results obtained from ligation of the portal vein whenever lateral repair could not be accomplished.

DR. J. ROGER NEWSTEDT (Cincinnati, Ohio): I had occasion some years ago to receive a patient, 27, who came down into the emergency room of a hospital in Cincinnati after a 50-mile trip, successfully negotiated on his motorcycle with a woman on the rear seat, only to come to grief at the last minute on a spin-out on wet pavement.

He was brought to the hospital by police ambulance at about midnight, complaining of abrasions and contusions of the right upper and lower chest, and not very much else. He vomited twice while he was being examined in the emergency room, and the emergency room physician, finding nothing on chest x-ray, gave him codeine for his pain, Dramamine for his vomiting, and then sent him home.

About four hours later, he was brought back to the emergency room by a taxicab driver, all of his friends and the police having long since departed, with the report that he had passed out four times getting into the cab, and vomited rather continuously all the way. He was in shock, of course, a typical example, as in Dr. Cerise's presentation.

After resuscitation in the operating room—we finally got him there—he did indeed have massive hemorrhage, and he had a gallbladder dangling by what turned out to be its cystic duct. This was the first time that I had seen this kind of an injury. He had a laceration of the liver through the gallbladder bed, extending, perhaps, a third of the way into the substance of the liver. And the source of the bleeding was not immediately apparent, but with pressure in the foramen of Winslow we finally discovered the hole in the side of what I think was the right hepatic artery, and we

ultimately did have to ligate that, and that was a matter of considerable trepidation at the time.

Fortunately, that did not cause any great trouble. He did recover, youth and health being what it is, and subsequently a liver scan study showed that there was good uptake of the isotope in the entire liver.

I suppose that if the ultimate indignity that both patient and surgeon are subject to is the death of the patient, the penultimate indignity must be to have the patient skip out after being brought back successfully from the grave to avoid paying his bill, and thus be lost to all follow-up; and I regret that that is what I have to report about this particular patient. To paraphrase Shakespeare's King Lear, all I can say is: "How sharper than a serpent's tooth it is to have a thankless patient."

DR. RONALD W. BUSUTTIL (Closing discussion): Drs. Neely, Skinner, and Newstedt, we appreciate your comments and your very interesting cases.

Dr. Stone, your personal commitment to the field of trauma surgery is well known and appreciated by all of us. However, despite your recent successes with portal vein ligation, we feel that the overall experience using this technique as a primary mode of therapy has really not proved to be a very acceptable modality due to the high mortality.

Perhaps if one ligates the portal vein distally, so that the last branch, the pancreaticoduodenal, is not included in this ligation, as Dr. Warren mentioned yesterday in his Presidential Address, then adequate collateralization can occur, to make this a more uniformly acceptable method of treatment.

I think we would all agree that there is no doubt that there are going to be certain situations in which the portal vein is so damaged, or that the patient is in such distress that definitive repair will not be accomplished. In these situations, then, I think portal vein ligation will have to be resorted to as a necessity; but I think at the present time, with the current data which is available, that ligation should be resorted to only when repair is absolutely precluded.

Until further physiologic and hemodynamic data is available to help evaluate the consequences of portal vein ligation, specifically, the splanchnic congestion and the late development of portal hypertension, some type of repair should be attempted. Dr. Stone, we look forward to your continuing contributions on this very important problem.

In summary, I would like to conclude by saying that although severe porta hepatis injury is indeed a potentially devastating condition, by adhering to the specific principles that we have outlined, these patients can be treated with an acceptable mortality.

(slide) We feel that mortality, indeed, best correlates with the injury to the portal vein and with injury to three or more associated organs. And lastly, as was emphasized, postoperative sepsis is of great importance in these patients, in that, the vast majority of them will have some type of a septic complication, and one should be aware of that.