

patients (Table 4) who have had hepatic resections for metastatic lesions, one is currently alive; the others have survived from 2 to 18 months (Table 13).

Primary Hepatic Cell Carcinoma Not Resected

Primary hepatic carcinoma was diagnosed in seven patients at autopsy. Six patients had hepatic cell carcinoma, two with concomitant alcoholic cirrhosis, and one had a cholangiocarcinoma.

After the widespread nature of their tumors had been disclosed at operation, eight patients* were treated by 5-fluorouracil infusion via an indwelling cannula in the hepatic artery (Table 14). Six of the eight patients have died, with an average survival time of 14.2 months. Two are alive with disease 2-½ and 4 years after operation.

Four patients (Table 15) received 5-fluorouracil intravenously with or without radiation therapy, and two patients received radiation therapy alone. All six patients had advanced liver involvement, usually with distant metastases; three died within 2 weeks, and only one survived longer than 5 months after institution of treatment.

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* One patient underwent a major resection, but residual tumor was identified.

DISCUSSION

DR. CHARLES H. WRAY (Augusta): I want to present one case we had some ten years ago that has stimulated my interest in liver resection.

(Slide) This patient presented with a transient episode of jaundice and a persistent elevation of the alkaline phosphatase over a month's time. We assumed there was a continuing obstruction in the common duct. This slide shows the opening of the common duct, and something beginning to extrude.

(Slide) This shows a tumor embolus with a blood clot that was removed from the common duct. A subsequent investigation showed that this tumor arose from the left hepatic duct.

The patient underwent a left hepatic resection, and I had followed her up until this January, when she developed pain. Our investigations at that time, though, showed no abnormalities. That is, the liver function studies were normal, and the liver scan had not changed over the years.

However, in April she came in jaundiced. Having had one major operation, with severe respiratory failure, she agreed to exploration only to relieve her jaundice. The next slide shows material that was curetted from the remaining portion of the common duct.

A T-tube was left in with a small catheter threaded through it, and the next slide shows how this was constructed, so that this end could be threaded up into a portion of the liver where the tumor remained. We have instilled 5-fluorouracil into the common duct for several months now. She has been free of jaundice and pain.

However, this case shows that the way we attack liver tumors is somewhat different than the way we attack other situations. It's obvious from the benign cases that Dr. Longmire presented that the liver can be operated on with a very low mortality. However, there is a significant operative mortality in patients with malignant disease. We do not investigate patients with liver problems in the same way that we investigate the kidney and the heart or the peripheral vessels, mainly because the liver is a large organ, and multiple studies are needed to decipher various changes.

For instance, one would need to do selective celiac arteriograms to find the arterial blood supply and possible ramifications on surgery; a splenoportogram, possibly, to show the portal circulation; a percutaneous cholangiogram to show the ducts, and a hepatic venogram to outline the hepatic circulation.

Perhaps if we did extensive studies such as this in patients with malignant disease, we would be able to better select patients who are candidates for surgery, and avoid some operative misadventures that these patients present.

DR. LEMUEL BOWDEN (New York): It seems quite appropriate that a paper of this caliber should be presented before the Southern Surgical Association, because, as far as I can determine from studying the historical aspects of this subject, it was just exactly 21 years ago before this Association that the first planned, aggressive attack on hepatic tumors was described by one of your distinguished senior members, Dr. Julian Quattlebaum.

I would like to direct my remarks to one aspect of Dr. Longmire's presentation which to me is significant. (Slide) This slide

details our experience at Memorial Hospital from 1950 through 1968 in 50 major hepatic resections for malignant tumors in every instance. In these 50 cases we had only six long-term survivors: one patient with metastatic sarcoma who died shortly after the five-year mark of further manifestations of her disease; one patient with metastatic colon cancer who is still living at 11 years following the hepatic resection, and who, I think represents the exception, since I am inclined to agree with Dr. Longmire that for metastatic tumors hepatic resection rarely proves curative; one long-term survivor with cancer of the gallbladder, dying at 15½ years following her hepatic resection of an independent primary cancer; and three patients with hepatocellular cancer, living and well at 16, 13 and 12 years following hepatic resection.

The thought I would like to leave, and I think it is supported by what Dr. Longmire has presented, is that hepatic resection can be curative in the treatment of primary hepatocellular carcinoma when this relatively uncommon neoplasm is encountered.

DR. RICHARD G. MARTIN (Houston): I would like to add a few cases and some philosophy as to the treatment, or surgery, of the liver when it comes to metastatic and malignant diseases. We at the Anderson Hospital have divided ours into three groups. We have a total of 46 cases which we would have considered possible operative cases. Now, this is not a large number, considering that we have had around 100,000 cases to date in the institution; but we try to screen them very carefully, with multiple tests, as Dr. Wray has mentioned.

The first group are the primary liver tumors, and this we divide further into pediatric cases and adult. We think there is a difference between the two as far as mortality is concerned.

In the pediatric cases, we had seven. We have three living at the present time, one four years, one 11 and one 16 years. We had one operative death. In the adult group we had nine cases, and in this we have only two that are living, one ten months and one three years. The mortality in this was almost twice that of the pediatric cases.

And then we have a group—the second group—metastatic lesions with the primary elsewhere. Again, we have divided these into pediatric and adult cases. In the pediatric cases we had three, and all three were Wilms' tumor. All three of these cases had been treated preoperatively by chemotherapy and x-ray therapy after they had had the kidney removed. One patient had lung metastasis, which went away with chemotherapy and x-ray therapy. Of the three cases, we had one operative death; the other two are living, one six years and one three years free of disease.

In all cases of metastatic disease we had 14. Seven were colon, with an average of around 2.5 years of survival. We had two leiomyosarcomas, metastatic, both from the stomach. One of these cases had the stomach removed five years ago, and the colon two years ago, both for malignancies, and the metastatic lesion in the liver turned out to be a leiomyosarcoma from the stomach.

We have two breasts; this is unusual, because we do not usually find these operable. We had one carcinoid, which was a postoperative death. This had a carcinoid syndrome, and we tried to reduce the bulk, but failed. We had one that had an adrenocortical tumor, and she has gone six years since she had her metastatic lesion removed.

The third group are those with direction extension into the liver from an adjacent organ. These were all adults. We had nine cases; three stomach, two colon, two gallbladder, and one rectoperitoneal. We had only two that lived over one year, and these died at two and a half and three years.

We therefore feel that with direct extension usually this is not profitable, but with the primary lesion and the metastatic lesion, we feel it is.

(Slide) This is the metastatic lesion from Wilms' tumor.

(Slide) Now, we agree with Dr. Wray that the angiograms are most important. If we are going to do it for malignant disease, we must have a solitary lesion. This is an arteriogram in a 5-months-old child, showing a large right hepatic lesion.

(Slide) This is a superior mesenteric artery angiogram in the same patient, showing the supply going from the superior mesenteric artery.

(Slide) We feel also that a venacavogram is important. This shows the narrowing of the vena cava. However, there was no invasion, and the lesion came out well.

(Slide) This is another arteriogram, showing a large right hepatic lesion. However, the venacavogram shows obstruction. This one was not operative.

DR. HUGH H. TROUT III (Closing discussion): I'd like to review briefly some of the technical aspects of liver resection which we feel have been of benefit. Unless tumor is obviously visible in both lobes of the liver, a large incision is necessary to adequately evaluate the operability of the tumor.

(Slide) Here's a massive tumor involving the right lobe of the liver which was able to be successfully resected with an extended right hepatectomy. The T-tube aids in the identification of the ducts.

(Slide) After the portal and hepatic veins have been severed, they are best closed with a running vascular suture.

(Slide) After the inflow vessel to the lobe to be resected has been divided, a line of demarcation develops between the cyanotic liver and the remaining liver. The line of resection should be made a couple of centimeters into the cyanotic liver substance to preserve the middle hepatic vein.

(Slide) Elective resection differs from resection for trauma in that in resection for trauma control of bleeding is of primary consideration, and a clamp across the porta hepatis may give time to control major bleeding and allow a smaller, nonanatomic resection.

(Slide) In performing a right hepatectomy, the chevron incision is T-ed up into the 8th intercostal space, and the diaphragm is divided in a radial fashion straight down to the inferior vena cava.

(Slide) Once adequate exposure is obtained, the liver is retracted medially and the peritoneum is divided. The small segmental hepatic veins are controlled with hemoclips, and the right hepatic vein is controlled with a vascular suture.

(Slide) Finally, a liver clamp is placed across the liver at the level of the demarcation, and the liver is divided with electric-cautery and the blunt edge of a scalpel handle, controlling the bleeding points with suture ligatures and clips.

Dr. Wray, the case you discussed is a fascinating one, and certainly confirms our experience that bile duct malignancies are quite slow growing. If you can control the jaundice and the liver failure due to the obstruction, you can sometimes have quite long-term and very satisfying results.

Dr. Bowden, I believe your data certainly confirm our feeling that although the long-term results in malignant disease of the liver certainly aren't excellent, the palliation and occasional cure make resection worthwhile.

Dr. Martin, we certainly enjoyed your data, and I think that we would agree with you very strongly that extensive diagnostic steps are very worthwhile, very informative and very necessary. We have discussed these in our paper, but certainly arteriograms are necessary when liver resection is contemplated.