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Discussion

Dr. Martin A. Adson (Rochester, Minnesota): I want to compliment Dr. Fortner on his accomplishment and his presentation and to agree with him by presenting briefly data that confirm his experience with malignant hepatomas.

(Slide) This first slide summarizes the results of my experience with resection of primary, solid liver tumors as of a year ago. On your left are the survival rates for resected primary hepatic malignancies, a 60% three-year survival and a nearly 40% five-year survival.

(Slide) On this next slide data are shown of comparative experiences before and since 1970, more than can be discussed in detail now. However, as the first line shows, there has been but one operative, hospital or early postoperative death. In the past year, nine additional major primary resections have been done for primary malignancy with no deaths, bringing the total for hepatomas to 35 cases.

I have had one additional postoperative death following a completion trisegmentectomy for recurrent tumor, done years after a right lobectomy. This is a sad and complicated story without time for telling, but has led me to believe that I will probably not try that operation again. However, clearly, an aggressive surgical approach to primary hepatic malignancies is justified by encouraging survival rates and acceptable operative risks, without resorting, as Dr. Fortner has said, to isolation-perfusion techniques. The extent of resection in our series is similar to Dr. Fortner's series.

Finally, I wanted to ask Dr. Fortner how aggressive we should be in dealing with larger metastatic hepatic tumors.

(Slide) Three years ago, we evaluated retrospectively survival following resection of colorectal metastases. Twenty patients who had multiple lesions removed were not benefited. However, of the forty patients who had apparent solitary lesions, most of which were removed at the time of the primary operation and 75% of which were two inches of less in diameter, 40% lived for five years and 28% lived for ten years after resection.

(Slide) Encouraged by this, we have taken a more aggressive approach to metastatic colorectal cancers, and in the past three years have done more than twenty *major* hepatic resections for larger metastatic lesions; many of these lesions have been detected some time after resection of the primary tumor, and many were symptomatic. There have been no operative deaths, but we have been disappointed to encounter either multiple lesions or extrahepatic spread in most of these cases, despite the use of angiographic techniques and computerized tomography.

I have two complicated slides tabulating early results which I will not burden you with, but they show that we will not know the result of our more heroic efforts for another year or so. However, we appear to be reaching a point of diminishing returns in our aggressiveness. I do have the feeling that we have helped significantly only about 15–20% of these patients with larger, symptomatic lesions. I'm interested to know Dr. Fortner's thoughts about management of these larger metastatic tumors.

Dr. John Terblanche (Cape Town, South Africa): I thought that I would remind the audience of the experience we have with black South African patients, in whom I believe this tumor is a different disease.

Almost all of the patients we see—and there are many of them—are inoperable. We have found peritoneoscopy useful in the investigation of these patients to prevent unnecessary laparotomies on a large group of patients who are inoperable. The majority of our patients have either multicentric disease throughout both lobes of the liver and this has usually been easily visible through the peritoneoscope, or severe associated cirrhosis. I would like to ask Dr. Fortner what his view is with regard to major resection of the liver in a patient who has severe cirrhosis.

The patients that we see in the black South African group are invariably dead within four to six months of the time of diagnosis. Almost all of them are young males who have been well until near the time of admission to hospital.

Of the major hepatic resections that we perform at Groote Schuur Hospital, the patients do not usually belong to this common group; they are the same type of patients that you are operating on here.

Dr. Richard E. Wilson (Boston, Massachusetts): I want to corroborate the fact that patients with colorectal cancer certainly deserve a chance at resection of metastases.

I'd like to direct two questions to Dr. Fortner. First, in such patients, when you talked of curative hepatic resection, did those include patients with multiple nodules as well as single nodules?

Second, what has been the pattern of recurrence after liver resection in these patients? Have the tumors recurred in the liver at the additional site, or have they recurred distantly?

Dr. Thomas Earl Starzl (Denver, Colorado): I've developed a personal series of hepatic resections, much smaller than Dr. Fortner's, but in agreement with many, although perhaps not all, of his points.

In 1975, the techniques that we used for hepatic resection were described in Surgery, Gynecology & Obstetrics employing careful hilar dissections and individual control of the hepatic veins, but with no special isolation-perfusion methods, which I think unnecessarily complicate the operation. We do not use the Lin-type clamps which some believe obviate the need for hilar dissection and control.

(Slide) We had 43 resections, abut half the size of Dr. Fortner's series. I draw your attention to the fact that almost half of these patients, 21 in all, have had extended right hepatic lobectomies (80% to 85% resection or trisegmentectomy). Nine and six, respectively, had true right and left lobectomies. Five had lateral segmentectomy and the rest were local excisions. There was no operative mortality.

We had a large number of trisegmentectomies because many of these patients were referred for liver transplantation after previous operation at which the lesions were thought to be nonresectable. In fact, the lesions could be removed with trisegmentectomy.

You will note that 11 of the 43 patients died two months to five years later of metastatic disease. However, the results in terms of control were encouraging, just as Dr. Fortner has indicated. Even of those patients who had localized hepatic metastases, five of nine are still alive after 2-½ to 3-½ years, and two of these five are free of all residual disease at follow-ups three years or later. When death occurs, after resection of isolated hepatic metastases, it tends to be from extrahepatic spread, to comment on Dr. Terblanche's question.

With primary hepatic malignancy, eight of 15 patients are alive, with follow-ups of one to 5-½ years, and seven of these eight patients have no evidence of residual disease. Thus, the figures from Dr. Fortner, those from Dr. Adson, and those which I am citing are all similar. They indicate that the pessimistic views about the

treatment of hepatic malignancies are probably not justified. We have treated all our patients with adjuvant chemotherapy.

(Slide) Finally, the complete safety with which traditional or even extended hepatic resection can be done has greatly expanded the indications, as I think was also evident from Drs. Fortner and Adson's series. Twenty of our hepatic resections were for benign disease, including eight adenomas and six hemangiomas. Three of the adenomas required trisegmentectomy for removal. These were adenomas that had ruptured.

From all of the comments we have heard today, it is clear that partial hepatic resections has entered a new era of safety, requiring no special gimmicks, nor anything other than the straightforward use of sound techniques and surgical principles which, in my opinion, simply involve adequate control of what comes into the resected specimen and adequate control of what leaves it.

DR. JAMES H. FOSTER (Hartford, Connecticut): I rise to compliment Dr. Fortner on his large personal experience and I support many of Dr. Fortner's conclusions. A nationwide review of cases of liver resection for both primary and secondary liver tumors, accomplished with the help of many in this audience, has allowed a look at short and long term survival. Unfortunately the operative mortality was closer to 20% than Dr. Fortner's 9%, but a surprising 35% of patients with primary tumors occurring in noncirrhotic liver lived five years or more after resection. Partial tumor resection for palliation or resection of cirrhotic livers was followed by dismal results. I was glad to see that Dr. Fortner has turned away from the more complicated isolation-perfusion technique for liver resection. It was also encouraging to note that 20% of patients with secondary tumors from colon and rectum carcinomas will live five years after resection of liver metastases, but resection of secondaries from other primary tumors was much less rewarding.

One area that I might differ from Dr. Fortner is in regard to an aggressive approach toward resection of hemangiomas and the solid benign tumors. I believe that hemangiomas are seldom symptomatic in the adult and should probably be watched, and I suspect that as we learn more about the true nature of liver cell adenomas and focal nodular hyperplasia we will be resecting fewer of these rare lesions.

DR. THOMAS TAYLOR WHITE (Seattle, Washington): I would like to ask Dr. Fortner a question he didn't discuss: When should we give chemotherapy, and how much?

Dr. Starzl also mentioned that he gave adjuvant chemotherapy. We've noticed that our chemotherapists want to give it right off the bat, and give many of the patients drug hepatitis. How much of a delay should we have? How much of a reduction in dosage? How does the timing play a part in the treatment of these patients?

DR. JOSEPH G. FORTNER (Closing discussion): The question of how aggressive we should be in resecting metastatic colorectal cancer to the liver is sort of amusing and puzzling coming from Dr. Adson. He has shown a 28% five-year survival rate after resecting metastatic colorectal cancer, and he's wondering, perhaps, if he should let the chemotherapists handle this instead because all he can get is 28%. The chemotherapist, after all, has a 40% response rate for thirty days, and maybe he should turn it over to him. It's always interesting to see the difference in reference point, that the surgeon makes strict demands on his own work, but seems to give in to the chemotherapist instead.

I really think that we should continue to carry out surgical resection of this, which is much more effective than any chemotherapeutic agent. Chemotherapy, of course, has a valuable place in adjuvant programs.

I think about half of our patients had multiple metastatic lesions, so we didn't see any difference in survival figures for either single or multiple metastatic lesions. It's important to point out, I think, that wedge resection is as good as major hepatic resection. It's only how much of the liver needs to be removed in order to get all gross disease out with a good margin. The survival figures are the same whether you wedge or do a major resection.

In reference to Dr. Terblanche's comments on their South African experience, we consider cirrhosis to be a contraindication to major hepatic resection. I think there were one or two who had mild cirrhosis in the series.

The pattern of recurrence that Dr. Wilson asked about is that most of these patients developed pulmonary metastases, or sites other than the liver. CEA level, of course, is important in following this. About two-thirds of the patients had positive CEA levels before resection, and these reverted to undetectable or low levels in all but one patient postresection; and that patient had a local recurrence in the liver about a year later. So I think it's an important way to monitor the results.

I agree with Dr. Foster that hepatoma can be a rather indolent disease in a small percentage but it's not always so. On the benign tumors, whether they need resection or not, the focal nodular hyperplasia—may or may not undergo spontaneous regression if you take the patients off hormones . I don't know. You can identify the lesion grossly quite well, and I think this is something that's unknown at the moment. If we had a preoperative diagnosis now, we would observe it only, and not resect it, unless there had been bleeding.

We're following a large number of giant, cavernous hemangiomas of the liver without resecting them, and I think the indication for their removal is a history of bleeding.

In reference to Dr. White's comment on postoperative chemotherapy, we start our adjuvant chemotherapy six weeks after the resection. Liver regeneration has advanced sufficiently at that time so that these patients can tolerate the chemotherapy just as well at that time as if they had not had a resection.