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Transcatheter arterial chemoembolization for hepatocellular carcinoma

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Summary. Hepatocellular carcinoma (HCC) was treated with transcatheter arterial chemoembolization (TACE) in a sample of 129 patients. The cumulative survival rate was 49% at 1 year and 22% at 2 years. The median survival time was 11.9 months. The survival rates at 1 year of 84 patients in Child's group A and 27 in Child's group B were 56% and 40%; out of 52 HCC patients with portal vein patent and 77 with portal vein invasion 75% and 40% survived, and the 1-year survival rates for 33 HCC patients with capsule intact, 14 with caspule broken and 82 with no capsule were 85%, 65% and 40% respectively. From the above results there were statistically significant differences in survival time in those with good clinical performance status by Child's classification, those showing patency of the portal vein and those where the capsule was present. Therefore, we would like to recommend, TACE of HCC in well-selected patients presenting with good clinical status, patency of the portal vein and without broken capsule, in order to achieve better clinical results.

Introduction

Hepatocellular carcinoma (HCC) is one of the common malignancies in Taiwan. According to the publication of the Ministry of Health, HCC ranks third among the causes cancer death of in the male population, next to lung cancer and gastric cancer in 1981 [3].

The natural course of untreated HCC shows poor life expectancy; the mean survival time is 4 months after onset of the initial symptoms [10]. The chemotherapy of HCC associated with hepatitis B, from either an intravenous or an intra-arterial route, has been disappointing and of a limited efficacy [1, 4, 5, 12, 14, 18]. The surgical resectability of HCC is also poor because of the associated liver cirrhosis, which is commonly present in our cases [9]. Recently chemoembolization has been well accepted for treating unresectable HCC and showed better results than systemic or intra-arterial chemotherapy [8, 13, 17, 19]. In this article we would analyze our results in order to define the efficacy of transcatheter arterial chemoembolization (TACE) as a function of the clinical status, patency of the portal vein and presence the tumor capsule.

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Materials and methods

Between July 1983 and May 1986 129 patients received TACE. A total of 238 chemoembolizations had been performed on these patients and 36 cases had received treatment more than twice.

To be included in this study, they had to meet following criteria:

1. Histology proven either by cytology or biopsy
2. Clinical performance status of Child's A and B patients [2]
3. No main portal vein invasion causing obstruction, as seen on an angiogram and/or computed tomogram
4. No distant metastais.

Of the patients 118 (91%) were men (mean age 56 years; range 21–80 years) and 11 (9%) were women (mean age 51 years; range 22–76 years). Hepatitis B surface antigen was found to be positive in 98 out of 129 patients (76%).

α-Fetoprotein was less than 14 ng/ml in 21 patients (16%), between 14 ng/ml and 40 ng/ml in 42 patients (33%) and above 400 ng/ml in the remaining 66 (51%).

Eighty-four patients were classified in Child's A group and 45 in Child's B group.

'Portal vein patent' was defined as presenting no invasion of the right or left portal vein or of the main portal vein as seen on the computed tomogram and/or angiogram, this condition was found in 52 patients.

Portal vein invasion to either the right or left portal vein was found in 77 patients. A computed tomogram showed that the tumor capsule could not be identified in 82 patients.

Embolizations were carried out through selective hepatic catheterizations, with injection of 10 mg mitomycin C or 20–30 mg adriamycin into the feeding artery followed by injection of a mixture of a further 10 mg mitomycin C or 20–30 mg adriamycin and 5–10 ml lipiodol; finally the feeding artery was embolized by 2–3 mm strips of Gelfoam.

Fifty-nine patients received mitomycin C and 70 patients received adriamycin as the chemotherapeutic agent in conjunction with embolization.

Results

The overall cumulative survival rate was 49% at 1 year and 22% at 2 years; median survival time was 11.9 months (Fig. 1 A).

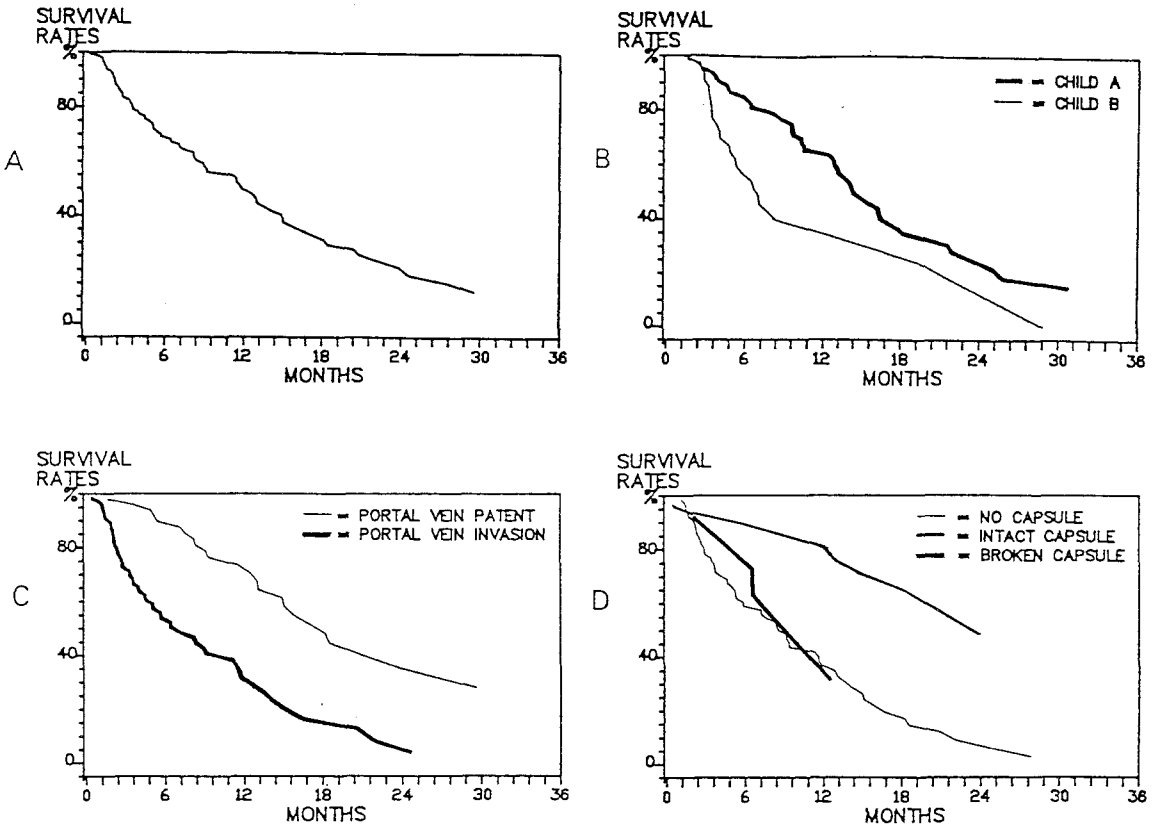

Fig. 1. Survival curves of **A** HCC patients; **B** Child's A and B groups; **C** portal vein patent and portal vein invasion; **D** intact capsule, broken capsule and no capsule

The survival rates of Child's A and B groups were, respectively, 56%, 40% at one year and 25%, 23% at two years; median survival times were 13 months and 5.7 months. This was statistically significant ($P < 0.0005$) (Fig. 1 B).

The difference in survival rates between patients with intact portal vein and those showing portal vein invasion was also statistically significant ($P < 0.0005$); these were 75%, 40% at 1 year and 40%, 10% at 2 years. The median survival times were 18.2 months and 7.1 months (Fig. 1 C).

The differences in survival rates and median survival times among patients with intact capsule, broken capsule and no capsule were statistically significant with 85%, 65% and 40% survival at one year and median survival times of 23.9, 12.4 and 9 months respectively (Fig. 1 D).

Discussion

The presence of the hepatitis B surface antigen is 71% of our sample confirmed the strong association of hepatitis B infection with cirrhosis and HCC in our region [16].

Recent reports on the use of serum α-fetoprotein levels and ultrasonography [7, 15, 16] have shown increases is resectability and improvement of the survival rate; unfortunately a large number of patients do not seek medical help before the disease has reached an advanced stage and the further complication of cirrhosis makes surgical resection impossible. For this group of patients, the results of systemic and intra-arterial chemotherapy were unsatisfactory and new chemotherapeutic methods remain to be found [1, 4, 5, 12, 14, 18].

Embolization has been used in treating hepatic tumors [8, 13, 17, 19] and the necrosis seen on pathological specimens confirmed the effectiveness of embolization in dealing with these tumors [11].

Our results were in agreement with those of Yamada et al. [17] and further confirmed the effectiveness of chemoembolization in the treatment of inoperable HCC. There were significant difference in survival rates of patients in Child groups A and B, between those with portal vein patent and those showing portal vein invasion and between those with intact, broken and no capsule. These findings indicate that the survival rate can be further improved by selection of patients with good clinical status, portal vein patency and the capsule integrity. According to our earlier experience, chemoembolization neither improves nor prolongs life in HCC patients with Child C status; therefore it is our belief that chemoembolization is the only better alternative treatment to surgery for inoperable HCC, and that clinical status, tumor invasion to the portal vein and integrity of the tumor capsule are the factors that influence the survival time and prognosis.

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