

# The double intervention clinical value and application research of TACE with PAI on massive hepatocellular carcinoma

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**Abstract Objective:** To study the efficacy of transcatheter arterial chemoembolization (TACE) combined with percutaneous acetic acid injection (PAI) on massive hepatocellular carcinoma (MHCC). **Methods:** TACE was performed in 57 patients with MHCC, which were randomly divided into group A ( $n = 28$ ) and group B ( $n = 29$ ). Patients in the group A received conventional TACE for the first time and then received low dose TACE (10 mg mitomycin C) for the repeated treatment, Re-examined CT scans after TACE for a week. Based on filled status of Lipiodol in the Lesions, PAI was underwent in the area of rarefaction or defect filled by Lipiodol. Patients in the group B received conventional TACE. Then The survival rate and masses variation and hepatic function and  $\alpha$ -FP and side effects were observed. **Results:** The 1-, 2- and 3-year survival rate after TACE were 96.4%, 78.6% and 32.1% for group A, and 65.5%, 48.3% and 20.7% for group B. Masses diminution were found in all patients in group A, while 20 cases were found in group B, unchanged in 5 cases and enlarged in 4 cases. **Conclusion:** The efficacy of TACE combined with PAI are significantly better than that of TACE only, low dose TACE produces less hepatic damage and less side effect.

**Key words** transcatheter arterial chemoembolization; hepatocarcinoma; percutaneous acetic acid injection

Transcatheter arterial chemoembolization (TACE) is recognized as one of the preferred therapy for unresectable advanced liver cancer, however, a considerable number of cases ineffective, mainly because of its failure to fully resolve the tumor cell necrosis. Because of the periphery of the massive hepatocellular carcinoma more portal blood supply, simple TACE treatment is not completely and easy to relapse. This study was from April 2000 to April 2002, 28 cases of the massive hepatocellular carcinoma patients were treated by TACE joint PAI and achieved good results.

## Materials and methods

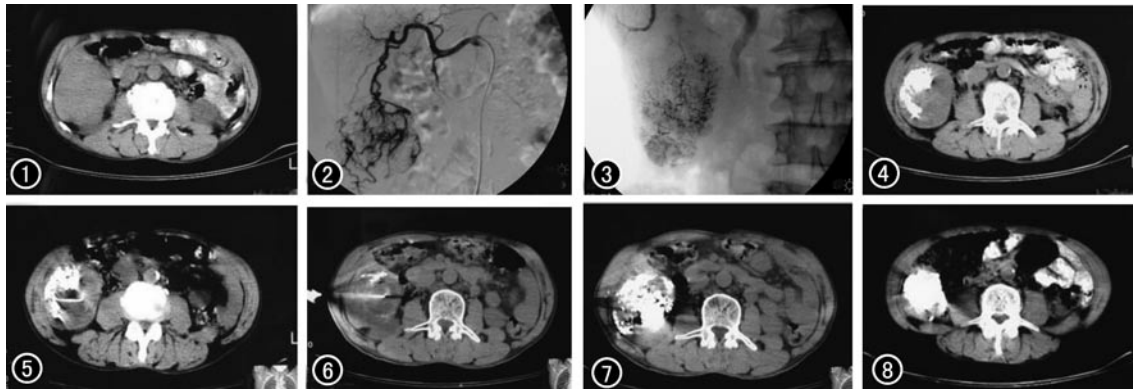
### Clinical data

A total of 57 cases, 44 cases were males, 13 cases were females. Age ranged from 28 to 72 years, with an average of 45 years. All cases of primary liver cancer were done with a fetal globulin ( $\alpha$ -FP), ultrasound, CT and angiography (including 12 patients with pathologically con-

firmed histology), the selected cases were in line with the 1977 National Liver Cancer Association for the Study of the development of the diagnostic criteria. Lesions were bulky, diameters were from 6 cm to 12 cm, liver function child grade, grade A 45 cases, grade B 12 cases. 57 cases of patients were randomly divided into two groups (group A and B patients had no significant difference in mass size, age structure and liver function): group A treated with TACE + PAI, group B treated with simply TACE.

### Treatment plan

28 cases in group A, were treated with the first line of conventional TACE, after intubation successful triple arterial infusion chemotherapy drugs: cisplatin 60 mg, doxorubicin 40 mg, 5-5-fluorouracil 1000 mg. Then 10 mg mitomycin C and 10–30 mL iodized oil emulsion around for peripheral embolization, the last with adequate cotton sponge rubber particles (1 mm  $\times$  1 mm  $\times$  1 mm) for the feeding artery embolization (Fig. 1–4), the interval of 30 to 45 days after treatment were small repeat TACE treatment dose: 10 mg mitomycin emulsified with Lipiodol embolization. Postoperative CT week review,



**Fig. 1** CT suggested that right lobe of the liver huge liver cancer ( $\alpha$ -FP = 14567.8)

**Fig. 2** Angiography showed that tumor angiogenesis rich

**Fig. 3** Lipiodol was Mission Flake filling after TACE

**Fig. 4** CT review showed irregular Lipiodol in the posterior defects

**Fig. 5, 6** The two 20 G fine needle aspiration of penetration lesions different regions from different parts with the CT-guided

**Fig. 7** Performance after PAI + Lipiodol injection

**Fig. 8** CT review showed lesions has significantly narrowed and the Lipiodol sediment compaction after three months

based on the Lipiodol filled, in the CT-guided percutaneous transhepatic 20 G needle inserted Lipiodol sparse and defect region (Fig. 5, 6), contrast agent injection test CT scan confirmed with the portal and not the same after bile duct injection of 50% acetic acid, the amount for each point each 1 mL to 2 mL, and then injection of 2 mL to 4 mL Lipiodol CT reexamination facilitate observation mass changes (Fig. 7, 8), the ratio of acetic acid and Lipiodol for 1:2. When under review with liver function, and  $\alpha$ -FP change color Doppler blood supply of tumors suggested that the situation be small dose of TACE or PAI or combined treatment. TACE total of 97 times, of which two times in three cases, three times in 12 cases, four times in 10 cases, five times in three cases. PAI total of 142 times (a multi-point puncture operator), three times in two cases, four times in five cases, five times in 12 cases, six times in seven cases, seven times in two cases. TACE + PAI combined therapy 84 times, with an average of three times each. Patients were rehydration 2500–3000 mL to dilute the acid concentration in the blood, reducing kidney toxicity. Group B 29 cases were treated with routine TACE.

## Results

Group A and B cumulative survival rates were shown in Table 1 (from the first day of implementation of TACE), 1-, 2-year survival rate statistics showed that group A was significantly higher than that of group B ( $\chi^2$  values were 6.868 and 4.393,  $P < 0.05$ )

Tumor sizes of 28 cases in group A were reduced, in group B 20 cases reduced, 5 cases were stable, 4 cases were enlarged.

**Table 1** Comparison of the massive HCC survival after treatment between 57 cases

Group	n	The survival time after treatment					
		> 1 year		> 2 years		> 3 years	
		n	%	n	%	n	%
A	28	27	96.43	22	78.57	9	32.14
B	29	19	65.52	14	48.28	6	20.69

In group A (28 cases),  $\alpha$ -FP positive 20 cases, 16 cases were normal after treatment, 4 cases to the original value of 30% or less. In group B (29 cases),  $\alpha$ -FP positive 21 cases, 16 cases were normal after treatment, 5 cases to the original value of 30% or less.

All patients received repeated treatment. In group A, 45.2% tumor vessels disappeared, 62.5% markedly reduced; hepatic artery occlusion with or without the establishment of collateral circulation of 34.2%, no tumor neovascularization. Group B, the disappearance of tumor angiogenesis of 31.5%, significantly reduce or 42.5%, tumor angiogenesis within accounted for 12.1%, liver function occlusion with or without the establishment of collateral circulation of 38.6%.

A group of 28 cases of liver damage after major performance for elevated liver transaminases, mildly elevated bilirubin, albumin decreased slightly, with more performance for abdominal pain, abdominal distension, moderate fever, and more in two weeks to resume normal. Group B 29 cases after treatment were significantly damage the liver function, mainly manifested as increased transaminase and bilirubin, albumin decreased in patients with abdominal pain, abdominal distention, nausea, vomiting, moderate fever, and more in 4 weeks back to normal.

## Discussion

### Relationship between the characteristics of the liver blood supply and liver cancer recurrence after TACE treatment

HCC supplied by the portal veins and hepatic arterial dual blood, its central part supplied by hepatic arterial blood, the parts of the tumor at the junction of the hepatic parenchyma supplied by the portal blood. Especially after the hepatic artery embolization is the case. When the hepatic artery embolization, the blood supply of the central part of HCC has been blocked, but there are still edge of the portal blood supply. The portal vein was considered tumor draining veins, coupled with the embolization collateral circulation after the establishment of these characteristics of hepatic artery embolization of residual tumor after, to continue to develop and play an important role in liver metastasis. Therefore, not only to cancer treatment TACE complete necrosis, and in the surrounding residual tumor foci.

### Damage of repeating TACE treatment of high-dose chemotherapy drugs to liver

Chemotherapy drugs inhibit tumor growth on the one hand has the role of the other, it also can add to the damage to liver function. Large doses of chemotherapy drugs directly damage liver cells, damage the liver cell necrosis and the surrounding non-parenchymal cells to stimulate collagen synthesis to increase and speed up the process of liver fibrosis, chemotherapy drugs and also enable multiple cytokines increase in the promotion of collagen fibers formation [1]. Therefore, the majority of patients eventually died of liver failure and other complications. Domestic Lu [2] *et al* through research proves: Small-dose chemotherapy drugs transcatheter embolization after chemotherapy necrosis and apoptosis in hepatoma cells and conventional dose chemotherapy drugs have the same effect. Hu [3] reported that TACE small dose of liver function in patients with lesser injuries, and the survival rate with conventional dose TACE did not exist significant differences. So small dose chemotherapy worth advocating. We took into account the chemotherapy drugs in the first pass liver effects and the resistance of tumor cells used for the first time TACE conventional dose therapy and repeated use of low-dose treatment with combination of TACE, and achieved good results.

### Comparison between PAI and PEI

Acetic acid with anhydrous alcohol with similar cells dehydration, protein coagulation and vascular occlusion

effect [4]. Along with the continuous deepening of Applied Research, found that alcohol infiltration capability limited to large multi-dose and multiple injection sites can complete tumor necrosis [5]. This inevitably led to an increase of all kinds of reactions and the possibility of complications, but some patients allergic to alcohol. Lu [6] and Zhou [7] have successively reported PAI treatment of small hepatocellular carcinoma and achieved good results. PAI and PEI as TACE alone can make up for the deficiencies, TACE treatment of peripheral tumor foci of residual or recurrent PAI treatment can be used to further consolidate and enhance the effectiveness and PAI simple, convenient. This study used 50% acetic acid treatment of 28 cases of TACE with PAI after treatment 142 times, After each surgery patients rehydration 2500–3000 mL to dilute the acid concentration in the blood, apart from the pain and fever, no obvious serious complications were found.

Through this study, group A firstly used TACE conventional dose therapy and repeated use of low-dose combined TACE, with PAI after treatment. Its efficacy was significantly higher than that in group B of TACE alone treatment, and patients with liver injury, fewer side, the quality of life can be improved. Therefore, the treatment group A worthy advocate.

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