

## · Case report 病例报告 ·

## Treatment of intrahepatic arteriovenous fistula in hepatocellular carcinoma with N-butyl-2-cyanoacrylate

LI Yu-liang, WANG Yong-zheng

中图分类号 R735.7 文献标识码 D 文章编号 :1008-794X(2007)02-0143-02

Primary hepatocellular carcinoma (HCC) continues to be one of the most common malignancies with an incidence of approximately one million cases per year and a dismal prognosis; some authors have reported a median survival of 1 ~ 2 months after diagnosis. Although surgery remains the only hope for cure, few patients are candidates<sup>[1,2]</sup>. As a result, the role of interventional radiology in the management of HCC has grown remarkably in the past decade. Transcatheter arterial chemoembolization (TACE), by far, is the most common technique used to treat unresectable HCC, that is usually performed with the selective arterial administration of ACA-lipiodol emulsion of iodized and gelatin sponge particles to occlude temporarily tumor feeding vessels<sup>[3]</sup>. Arteriovenous shunt has been reported in HCC and is usually as a recognized contraindication of TACE<sup>[4]</sup>.

In this paper, a patient of HCC with intratumoral arteriovenous fistula was successfully embolized with the mixture of N-butyl-2-cyanoacrylate and ethiodol oil by us.

**CASE REPORT**

A 49-year-old man with biopsy-proved HCC was admitted to our hospital in 12 Sep of 2002. The patient had a markedly large remarkable lesion (8 cm × 8 cm × 7 cm) in the right liver with elevation of  $\alpha$ -fetoprotein (AFP) 1 210 ng/L and the liver enzyme levels, such as alanine amino-transferase (ALT) level to 85 U/L and aspartate aminotransferase (AST) level to 55 U/L. Serum total bile level was 25.4  $\mu$ mol/L and serum creatinine level was normal.

The first segmental TACE was performed in 15 Sep of 2002, and followed by helical CT plain scan of abdomen one month later, showing non-totally was performed after

chemoembolization. That showed the distribution of the ACA-lipiodol emulsion in the tumor. In 19 Oct of 2002, another TACE was referred, common hepatic angiography revealed some residual tumor vessels with tumor staining, and simultaneously the right hepatic vein was visualized in the arterial phase, i.e. hepatic arteriovenous fistula (Fig 1). Then a superselective angiography was performed with 3 F catheter (Mass transit, Cordis) and N-butyl-2-cyanoacrylate mixed with lipiodol in a ratio 1:3 was injected. To avoid immediate polymerization of this mixture in the microcatheter, the microcatheter should be flushed with 5% glucose pre-injection. Embolization procedure was taken under DSA guidance until blood stasis was achieved and then arteriogram was taken immediately to observe the results (Fig 2 and 3).

Prior to this procedure, intravenous hydration was necessary to reduce the risk of TAE-induced renal failure, analgesic and antiemetic drugs including piritramide and ondansetron were administered.

The patient was tolerated of this procedure very well, with no evidence of postembolization syndrome, and was discharged after 5-day stay. At 10-month follow-up after the second embolization unenhanced CT scan abdomen furtherly found excellent distribution of the cyanoacrylate-lipiodol mixture in the tumor area with decrease of tumor size. The patient survived up to date.

**DISCUSSION**

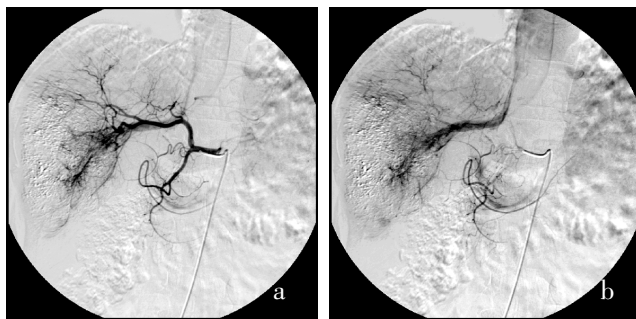
It is a contraindication to perform chemoembolic treatment of HCC, when an intrahepatic transtumoral arteriovenous fistula is present. At this time the embolization of the fistular feeding artery is emphatically stressed.

In general, it is recommended first to embolize the shunt by using gelatin sponge pledgets. Although this process could occlude temporarily the shunt, the hypervascularity of tumor may be preserved.

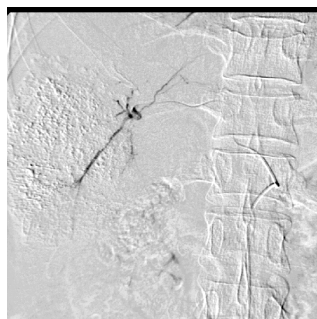
N-butyl-2-cyanoacrylate, as introduced by Winkelbauer et

**Authors setting** The Second Hospital of Shandong University, Jinan 250033, China (Li YL, Wang YZ)

**Corresponding author** LI Yu-liang, The Second Hospital of Shandong University, Jinan 250033, China



**Figure 1** (a, b) One month later, selective common hepatic angiography reveals residual arterial vascularization and right hepatic vein was seen in the arterial phase



**Figure 2** Superselective catheterization of the vessel supplying the arteriovenous fistula is performed. The cyanoacrylate-lipiodol mixture is injected into the vessel supplying the arteriovenous fistula is performed under the state of digital subtraction angiography



**Figure 3** Postembolization common hepatic angiography obtained immediately shows a complete tumor devascularization. The fistula disappears

al<sup>[5, 6]</sup> for liver metastasis of malignant insulinomas, is a liquid embolic agent which polymerizes instantaneously in contact with blood and endothelium. If mixed with lipiodol, its polymerization time can be prolonged to 10 ~ 115 seconds, depending on the degree of dilution. Embolization of the hepatic arteriovenous shunt with use of cyanoacrylate can achieve a complete and permanent occlusion of the hepatic arteries<sup>[7, 8]</sup>.

This preliminary report by us in China would further confirmed that the use of cyanoacrylate is beneficial for the palliative treatment of unresectable HCC with arteriovenous fistula, because of the permanent occlusion of the fistula makes the TACE to obtain a satisfactory effect, and in term to be consider that is feasible in the treatment of inhepatic arteriovenous fistula in HCC.

#### [ References ]

- [ 1 ] Bismuth H, Houssin D, Ornowski J, et al. Liver resection in cirrhotic patients: a western experience [J] World J Surg, 1986, 10: 311 - 316.
- [ 2 ] Stuart KE, Anand AJ, Jenkins RL. Hepatocellular carcinoma in the United States: prognostic features, treatment outcome, and survival [J] Cancer, 1996, 77: 2217 - 2222.
- [ 3 ] Bruix J. Treatment of hepatocellular carcinoma [J] Hepatology, 1997, 25: 259 - 262.
- [ 4 ] Widman A, Speranzini MB, Oliveira IR, et al. Intrahepatic transtumoral arteriovenous fistulae (diagnosis, importance, therapeutic proposals) [J] Arq Gastroenterol, 2000, 37: 13 - 19.
- [ 5 ] Winkelbauer FW, Niederle B, Graf O, et al. Malignant insulinoma: permanent hepatic artery embolization of liver metastasis-preliminary results [J] Cardiovasc Intervent Radiol, 1995, 18: 353 - 359.
- [ 6 ] Winkelbauer FW, Niederle B, Pietschmann F, et al. Hepatic artery embolotherapy of hepatic metastases from carcinoid tumors: value of using a mixture of cyanoacrylate and ethiodized oil [J] AJR, 1995, 165: 323 - 327.
- [ 7 ] Loewe C, Cejna M, Schoder M, et al. Arterial embolization of unresectable hepatocellular carcinoma with use of cyanoacrylate and lipiodol [J] JVIR, 2002, 13: 61 - 69.
- [ 8 ] Koizumi J. Arterial embolization of unresectable hepatocellular carcinoma with use of microspheres, lipiodol, and cyanoacrylate [J] Cardiovasc Intervent Radiol, 2006, 29: 928 - 928.

(received 2006-06-07)