

## Study on the Efficacy of Ultrasound-Guided Application of Absolute Ethanol and Polycinol on the Treatment of Renal Cysts

Lianjie Bai, Huilin Liu

The Second Affiliated Hospital of Qigihar Medical University, Qigihar, Heilongjiang, China

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**Abstract:** Objective To compare and analyze the efficacy and safety of using absolute ethanol and polycinol in the treatment of simple liver and kidney cysts. Methods Eighty-one cases of simple liver and kidney cysts were divided into anhydrous ethanol treatment group (30 cases) and polycinol treatment group (51 cases). The patients were treated with ultrasound-guided sclerosis, and the effects and adverse reactions were compared and observed. Results After 6 months of follow-up, there was no statistically significant difference in efficacy between the two groups ( $P > 0.05$ ), and the adverse reaction rate was statistically significant in the polycinol group (9.8%) compared with the anhydrous ethanol group (40%) ( $P < 0.01$ ). Conclusion Polycinol is safe and effective in the treatment of simple liver and renal cystic sclerosis, and is an effective alternative to absolute ethanol.

### 1. Introduction

Liver and kidney cysts are common clinical liver and kidney benign diseases. Most patients have no obvious clinical symptoms. Most of them are found during physical examination. Some patients may experience intermittent pain in the flank and back. Occasionally, gastrointestinal symptoms may occur. Area or abdomen touches the mass. The treatment of liver and kidney cysts is mainly surgery, but the previous open surgery has caused greater damage to the patient's body. With the development of ultrasound intervention, ultrasound-guided percutaneous liver and kidney cyst drainage fluid solidification treatment has become a commonly used clinical treatment. Anhydrous ethanol and polycinol are commonly used curing drugs in the clinic. This article mainly observes the effects of two drugs on the treatment of middle-aged and elderly patients with liver and kidney cysts.

### 2. Materials and Methods

A total of 324 middle-aged and elderly patients undergoing liver and kidney cyst treatment from January 2016 to December 2017 were selected for clinical research. Patients were diagnosed by ultrasound and imaging examinations such as contrast ultrasound and CT. According to the order of visit time, the patients with serial number as the observation group (162 cases), including 91 males and 71 females, aged 50 to 73 [mean ( $62.37 \pm 8.82$ )] years old. There were 103 cases of liver cysts and 59 cases of renal cysts. The diameter of the cysts ranged from 5.0 to 17.6 [mean ( $7.33 \pm 2.52$ )] cm. The patients with serial number double were used as the control group (162 cases), including 88 males and 74 females, aged 50 to 75 [mean ( $63.42 \pm 9.97$ )] years old. There were 98 cases of liver cysts and 64 cases of renal cysts with cyst diameters of 5.0 to 15.3 [mean ( $7.14 \pm 3.33$ )] cm. There was no significant difference in gender, age, cyst diameter, and cyst site between the two groups ( $P > 0.05$ ), and they were comparable. This research report was requested to be researched and approved by the hospital ethics committee. Inclusion criteria: (1) Those diagnosed with simple liver and kidney cysts after imaging diagnosis. (2) Patients with waist and abdomen pain, accompanied by clinical symptoms such as bloating. (3) Those who refuse surgery. (4) The diameter of a single cyst is 5 cm or more, and at least one of the multiple cysts is 5 cm or more. (5) Clear consciousness, able to cooperate with the therapist. (6) Those with normal coagulation function and blood routine. (7) Patients with blood pressure below 150/95 mmHg. (8) Patients with fasting blood glucose below

7.0 mmol / L. (9) Informed consent to this study. Exclusion criteria: (1) Patients with polycystic liver and polycystic kidney disease. (2) Patients with other liver and kidney diseases. (3) Those who are allergic to ethanol or poly (alcohol). (4) Patients with intrahepatic bile duct cystic dilatation. (5) Patients with traffic cysts.

(6) Patients with severe insufficiency of heart, lung, brain and other organs. (7) Patients with systemic diseases such as blood, immunity and tumor. (8) Those with poor blood coagulation mechanism and unable to improve after treatment. (9) Patients with a history of depression, mania and other mental illnesses. (10) Patients who can not cooperate with holding breath during cough, asthma and puncture. (11) Patients whose cysts are special and unable to determine a safe puncture path under ultrasound guidance. (12) Patients with poor compliance and unable to cooperate with treatment.

All patients underwent ultrasound intervention. A Chinese Mindray DC-8 EXP type color ultrasound diagnostic instrument was used for ultrasound interventional therapy. The probe was a SC5-1E convex array probe with a frequency of 1 to 5 MHz, a BD Angiocath 16G 133 mm OTC needle, and a sterile probe cover. The patients were fasted for 4 hours before surgery, and the patients were trained to cooperate with breathing. For patients with high mental stress, appropriate sedative drugs can be given. First, measure the left, right, up and down, and anterior and posterior diameters of the target cyst, calculate the cyst volume, reconfirm that the cyst is in a proper position, and mark it on the surface. For routine disinfection, use 2% lidocaine for local anesthesia. Under ultrasound guidance, choose a path close to the body surface and avoid the pleura, bowel, important blood vessels and organs. Needle puncture, it is better to real-time show that the needle tip reaches 1/2 to 1/3 of the center of the cyst. Withdraw the needle core, extract an appropriate amount of cystic fluid, and perform a cystic fluid protein test to determine the cystic fluid. Exfoliated cells were routinely submitted for inspection. Observation group: Using Mon freus method, polycinol was made into a foam-like hardener according to the ratio of medicinal solution to air 1: 4. Inject 100 mg for cysts  $\leq 6.0$  cm in diameter and 200 mg for diameters  $> 6.0$  cm. 20 minutes after the injection, the patient was instructed to perform lateral movements in a small amount so that the polycinol could fully contact the capsule wall. Control group: Anhydrous ethanol was injected according to the volume of the cyst cavity. Usually, the amount of absolute ethanol did not exceed 3/4 of the volume of the extracted cyst fluid. Repeated rinsing was repeated. Finally, the absolute ethanol was kept in the cyst cavity for 5 minutes, and then the ethanol was extracted. After curing treatment in both groups, the puncture needle was quickly pulled out, and local compression was applied. The puncture position was maintained for 20 minutes, and the vital signs of the patients were monitored for 4 to 6 hours. If complications were found, they should be treated in time.

The patients in the two groups were reviewed 3 months after the operation, and ultrasound and other imaging examinations were performed to observe the cyst volume of the patients and judge the curative effect. The curative effects of the two groups were compared. Efficacy evaluation criteria: Healing: The cyst completely disappeared or disappeared, the diameter of the cyst cavity was less than 0.5 cm; markedly effective: the cyst volume was reduced by more than 2/3, but the diameter of the cyst cavity was more than 0.5 cm; effective: the cyst volume was smaller than Before treatment, the reduction was more than 1/3, but less than 2/3. Ineffective: The cyst volume is not significantly changed or shrinks less than 1/3 compared with that before treatment. Total effective rate = (healed + markedly + effective) / total number of cases  $\times 100\%$ .

Adverse effects such as fever, abdominal distension, abdominal pain, bleeding, nausea and vomiting, and drunkenness were observed and compared between the two groups of patients. For patients with liver cysts and kidney cysts, liver and kidney function tests were performed before treatment, 1 week after operation, and 6 months after operation. Liver function tests included total bilirubin (TBil) and alanine aminotransferase (ALT). Aspartate aminotransferase (AST), alkaline phosphatase (ALP), cholinesterase (CHE). Renal function tests include serum urea nitrogen (BUN) and serum creatinine (Sc).

### 3. Results Analysis

There were no significant differences in TBil, ALT, AST, ALP, and CHE before treatment between the two groups ( $P > 0.05$ ). At 1 week after treatment, the levels of ALT and AST in the control group were significantly higher than those in the observation group ( $P < 0.05$ ). There was no significant difference in the other indicators ( $P > 0.05$ ). There was no significant difference in the above indexes between the two groups at 6 months after treatment ( $P > 0.05$ ). From the perspective of changes in the group, there was no significant difference in TBil levels between the two groups after 1 week and 6 months after treatment ( $P > 0.05$ ). The levels of ALP and CHE between the two groups after treatment There was no statistically significant difference in the previous comparison ( $P > 0.05$ ). At 6 months after treatment, ALP was significantly lower than that before treatment, and CHE was significantly increased ( $P < 0.05$ ). Before and after treatment, the AST and ALT levels were observed in the observation group. There was no significant difference between 1 week and 6 months after treatment, and the control group increased significantly after 1 week ( $P < 0.05$ ). There was no significant difference between 6 months after treatment and before treatment ( $P > 0.05$ ).

There were no significant differences in BUN and Scr levels between the two groups before treatment, 1 week after treatment, and 6 months after treatment ( $P > 0.05$ ). As the most common benign tumor in clinical practice, cysts can grow in almost all tissues of the human body, regardless of the surface of the human body or in the internal organs, there are records of cysts. The etiology of cysts is not clear. Most patients are caused by congenital genetic factors, such as chromosomal diseases or congenital abnormalities, and the acquired pathogenesis of cysts is currently unknown. Cysts are mainly round in shape with prominent surfaces. The edges are smooth, the outer wall is surrounded by cyst walls, and the cysts have good mobility and have less adhesion to surrounding tissues. The inside of the cyst is cystic fluid, which is usually localized and does not cause clinical symptoms. However, cysts gradually increase in a small number of patients, and compression of surrounding tissues can cause clinical symptoms. Liver cysts and renal cysts are the cysts with the highest incidence. If the liver cyst is too large, it may cause acute bleeding once it ruptures. If infection or bleeding occurs inside the cyst, it may cause obstructive jaundice. Excessive renal cysts may compress the kidneys and cause related clinical symptoms. For such patients, surgery is needed. Because the volume of cysts is positively related to age, middle-aged and elderly patients with liver and kidney cysts have more clinical symptoms and require treatment. However, these patients often have more underlying diseases and are in poor physical condition, and cannot tolerate conventional open surgery.

Early cystic interventional therapy only used a puncture needle to extract the cyst fluid, but this method could not cure the cyst, and had a very high recurrence rate of 28.6% to 97.6%. The study found that the fluid-secreting epithelial cells were not destroyed after the simple cystic fluid was withdrawn, so the fluid continued to be secreted after the puncture, causing the cyst to recur. In order to solve this problem, interventional treatment of cysts has been improved. Sclerosing agents are injected into the cysts to destroy epithelial cells and inhibit the secretion of cystic fluid to achieve the purpose of curing cysts. The choice of sclerosing agent has become the key to treatment. It is necessary to achieve both the therapeutic purpose and reduce side effects. Anhydrous ethanol is the earliest and most widely used sclerosing agent, but adverse reactions such as hypothermia, allergies, and drunken reactions caused by anhydrous ethanol affect the treatment of patients. Polycinol is a mixture of hydroxypolyethoxydodecane and ethanol, with a volume ratio of 19:1. Hydroxypolyethoxydodecane has a strong foaming property and is a surface-active compound. The emulsification of ethanol can reduce the occurrence of foaming. In addition to these two main ingredients, polycinol also contains a small amount of disodium hydrogen phosphate and potassium dihydrogen phosphate. Polycinol has the function of precipitating cellular proteins from the cells, thereby destroying the endothelial cells of the cyst wall, causing the epithelial cells to be permanently necrotic, no longer secreting cystic fluid, and playing a curative effect.

#### 4. Conclusion

This study shows that the clinical efficacy of polycinol and absolute ethanol in treating liver and kidney cysts is similar. In terms of side effects, the safety of polycinol is significantly better than that of anhydrous ethanol. As a sclerosing agent, adverse reactions can be significantly reduced. From the perspective of the effects on liver and kidney function of patients, absolute alcohol and polycinol have effects on TBil, ALT, ALP, Changes in CHE levels had no effect. The levels of ALT, ALP, and CHE significantly decreased after 6 months of follow-up. This was due to the effect of cyst removal on the liver, which restored liver function. Anhydrous ethanol has a certain stimulus to patients' ALT and AST levels. This is due to adverse reactions caused by drug metabolism in the liver, while polycinol has no such change, indicating that polycinol is safer than anhydrous ethanol. Renal cysts have no significant effect on the patient's renal function, and the two curing agents also have no significant effect on renal function, which has good renal safety. In summary, the effect of ultrasound-guided application of polycinol for solidification of liver and kidney cysts in middle-aged and elderly patients is not significantly different from that of absolute ethanol, but the adverse effects of polycinol on patients are low, and the short-term effects on liver and kidney function of patients The impact is small, so it has important clinical application value.

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