



# ALCOHOL SCLEROTHERAPY IN THE TREATMENT OF SYMPTOMATIC SIMPLE RENAL CYSTS

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## ABSTRACT

The aim of this study was to evaluate the results of percutaneous drainage with single-session alcohol sclerotherapy in the treatment of symptomatic simple renal cysts.

Thirty patients (16 men and 14 women, average age  $54,7 \pm 11,3$  years) with simple renal cysts were treated by ultrasound guided percutaneous aspiration and single-session alcohol sclerotherapy. Patient demographics, clinical characteristics, treatment outcome and complications were analyzed.

Average reduction of cyst volume was 91,2%. Complete and partial resolution occurred in 10 (33%) and 14 (47%) cysts, respectively. Six cases were defined as failure with reduction of cyst volume <80%. Flank pain improved in all patients, regardless of complete or partial resolution. Minor complications occurred in 8 patients. The hospital stay was one day for all patients.

Treatment of simple renal cysts is indicated when the cysts are sufficiently large and cause complaints or when associated with complications. Percutaneous treatment with alcohol sclerotherapy of benign renal cysts can be performed safely and effectively.

KEY WORDS: interventional ultrasound, ethanol sclerotherapy, percutaneous treatment

## INTRODUCTION

Simple renal cysts are usually asymptomatic and require no treatment, however, can be associated with flank pain, hematuria, hypertension, and compression of the pelvicalyceal system (1, 2, 3, 4). Symptomatic renal cysts can be managed by a variety of surgical and percutaneous methods, including percutaneous aspiration (with or without sclerosing agent), percutaneous marsupialization, and open or laparoscopic cyst unroofing. Advances in minimally invasive percutaneous treatment have provided an opportunity to treat these cysts with aspiration of cystic fluid and injection of sclerosing agent. The most often percutaneous treatment for symptomatic renal cysts is aspiration with alcohol sclerotherapy (2, 3, 4, 5), rarely by other sclerosance (6,7, 8). We conducted this study to evaluate the efficiency and safety of single-session alcohol sclerotherapy in the treatment of symptomatic benign renal cysts.

## PATIENTS AND METHODS

Patients were enrolled if they had symptoms and signs caused by a simple renal cyst confirmed by ultrasound (US) or computerized tomography (CT) examination and underwent percutaneous sclerotherapy treatment. Exclusion criteria were infectious renal cysts, autosomal dominant polycystic kidney disease (ADPKD), cystic tumor of the kidney and coagulopathy. When there was uncertainty about the relationship between the cyst and clinical symptoms, the possibility of co-existing pathology had to be excluded. The evaluation was made 7 days after the procedure, thereby ruling out the adverse impact of the procedure itself upon clinical status of the patient. If symptoms disappeared after the procedure, they were attributed to the cyst. If symptoms persisted, patients were excluded from the study. The applied percutaneous technique was the trocar method using an 8F multisidehole pigtail catheter (Boston Scientific, Boston, USA), which was introduced into the cyst cavity. Procedure was performed using local anesthesia, having patients supine or on the side. No conscious sedation was applied. Cystic fluid was aspirated through the catheter as much as possible. The volume of aspirated fluid was recorded. A fluid sample was sent for bacteriological and cytological examinations. To ensure that there was no communication with the pelvicalyceal system and no leakage through the cyst wall, we injected diluted contrast medium into the cyst (50% of the aspirated volume). If those complications occurred or if the

aspiration of contrast was incomplete, the procedure was discontinued. After the contrast medium aspiration, 96% alcohol was injected and remained in the cyst cavity for 2 hours. Alcohol was then evacuated and catheter removed. If during alcohol instillation patient experienced severe pain, alcohol was aspirated completely and the catheter removed immediately. We injected 96% alcohol in an amount of approximately 30-40% of the aspirated volume of the renal cysts but never exceeding 100 ml, irrespective of the size of the cyst. Smaller injected volumes were used when patients experienced intractable pain during alcohol instillation. The patient moved from prone to supine and bilateral decubitus positions at 10-minute intervals to increase contact between all surfaces of the cyst epithelium and alcohol. To ensure patient safety, we checked vital signs every 15 minutes for 2 hours. Alcohol concentration in blood was not tested routinely. After the procedure, the patient rested in bed for 2 hours. If patients were without symptoms, discharge from hospital was allowed on the following day. Patients were evaluated after 3 months by clinical assessment, ultrasonography or CT scan. Success was defined as complete or partial when there was total ablation or greater than 80% reduction with resolution of symptoms, respectively. Failure was defined as less than 80% reduction and/or persistent symptoms.

## RESULTS

The mean volume of all 30 cysts was  $363,9 \pm 251,9$  ml and mean cyst size was  $95,6 \pm 34,2$  mm before treatment (Table 1). Average reduction of cyst volume was 91, 2%. During the follow-up period, 9 cysts (30%) disappeared completely (Table 2). None of the cysts recurred after disappearance. The hospital stay was one day for all patients.

Characteristics	Number of patients (n=30)
Age (years)	$54,7 \pm 11,3$
Range	(41-73)
Sex ratio (M/F)	16/14
No. renal cysts	30
Laterality (Rt/Lt)	10/20
<b>Cyst size (mm)</b>	
<60	4
60-100	15
$\geq 100$	11
Mean size (mm)	$95,6 \pm 34,2$
<b>Cyst volume (ml)</b>	
<500	19
$\geq 500$	11
Mean volume (ml)	$363,9 \pm 251,9$

TABLE 1. Characteristics of Patients and Cysts

Characteristics	n=30	%
Renal cyst reduction rate		
Successful treatment	24	80
Disappearance (100%)	10	33
Reduction over 80%	14	47
Failed treatment (<80%)	6	20
Complications		
Severe pain	2	7
Mild pain	3	10
Mild fever	3	10
Examination of cystic fluid		
Biochemical profile	All normal	100
Cytological studies	All negative	100

TABLE 2. Characteristics of Treatment and Follow-up (n=30)

There were 11 giant renal cysts, with the amount of obtained content more than 500 ml during procedure (Table 1). Six patients with giant cysts had recurrence of the cyst, with mean volume of  $132,2 \pm 31,5$  ml (range 65-133) and loin pain accompanying them, thereby requiring additional treatment. They were successfully treated with new prolonged catheter drainage. Additional treatment was applied only to patients with giant cysts. The percentage of instilled alcohol varied between 4-37% of initial volume of the cyst. The limitation to reach optimal amount of sclerosance was intractable pain in 2 patients, and giant cysts with more than 500 ml of aspirated liquid in 11 patients. The flank pain was present with variable degrees in all patients before treatment. The flank pain subsided in all patients, regardless of whether there was complete or partial resolution of the cyst. During follow-up period pain recurred in 8 patients and they required additional treatment. In 8 patients with associated hypertension blood pressure was well controlled, in 6 with no medication and in 2 improved after cyst ablation. Hematuria disappeared in all 4 patients after cyst ablation and urinalysis showed no microscopic hematuria. During ethanol instillation pain was severe in 2 cases and moderate in 3. Three patients had mild fever. All symptoms and signs disappeared during the first 24 hours after the procedure.

## DISCUSSION

The recent trend in management of symptomatic renal cysts has been more strongly toward minimally invasive approaches that are based on percutaneous treatment. Appropriate procedure selection depends on clinical goal in addition to considerations of patient safety, comfort and cost. Several authors consider that percutaneous cyst aspiration or drainage without sclerotherapy is not ef-

fective and lead to high recurrence rate (1, 4, 5, 9, 10) because secretions of the epithelial cell lining in renal cysts inhibit obliteration of the cyst. They suggest the use of sclerosing agent to produce further coagulation-induced necrosis of the cyst epithelium and to result in definitive obliteration of the cyst. Several sclerosing agents including ethanol, glucose, phenol, chlorohydroacetate, pentopaque, acetic acid, povidone iodine, tetracycline, bismuth phosphate and ethanolamine oleate have been used to injure the epithelial cells of the wall (6, 7, 8). Some studies consider that prolonged drainage with negative pressure could yield better results than single session sclerotherapy since content of the cyst was evacuated rapidly by drainage with negative pressure, resulting in the destruction of cystic epithelium and obliteration of the cyst cavity (11, 12).

The treatment with alcohol as the sclerosing agent varies significantly in different studies with respect to the time of exposure to ethanol, concentration and volume of ethanol, and the number of sclerotherapy sessions. Some authors used a multiple-session technique with 12 hours-to-2-day interval between each session. Their results suggest that multiple sclerotherapy is better than a single injection of sclerosance for reducing the recurrence rate of simple renal cysts. But, multiple injections have a potential risk of infection and repeated aspiration and injection procedures bring about additional discomfort and inconvenience (5, 11, 13). In other studies, single session alcohol sclerotherapy (2, 3, 14, 15) was performed with good results. They recommend single-session alcohol sclerotherapy as sufficient and less risky method. The time of exposure to sclerosance varies widely (from 10 min to 4 hours) in various reports (14, 16). Volume of alcohol injected after aspiration varied from 20% to 50% of the cyst volume, with maximal dose between 75-200 ml in various reports (1, 2, 3, 4, 14, 15). In our series pain was relieved in all presented patients, irrespective of whether there was complete or partial resolution of the cyst. Pain relief after partial regression indicated that the residual cyst did not necessarily require further intervention, as long as the pain or other significant symptoms or signs did not recur. In all patients with associated hypertension, the blood pressure was normalized or improved after cyst ablation. Hematuria was present in seven patients and eventually resolved in all. Our results are similar to others that report percutaneous treatment to have high success rates of reduction of cyst volumes and to have improved the symptoms and signs related to simple renal cysts after their ablation (2, 3, 4, 13, 15, 16).

## CONCLUSION

Treatment of simple renal cysts is indicated when the cysts are sufficiently large and cause complaints or when associated with complications. Based on the results of our study, we conclude that percutaneous treatment with alcohol sclerotherapy of benign renal cysts can be performed safely and effectively.

## REFERENCES

- (1) Mohsen T., Gomha M.A. Treatment of symptomatic simple renal cysts by percutaneous aspiration and ethanol sclerotherapy. *BJU Int* 2005; 96: 1369-1372
- (2) Falci-Junior R., Lucon A.M., Cerri L.M., Danilovic A., Da Rocha P.C., Arap S. Treatment of simple renal cysts with single-session percutaneous ethanol sclerotherapy without drainage of the sclerosing agent. *J. Endourol.* 2005; 19: 834-838.
- (3) Okeke A.A., Mitchelmore A.E., Keeley F.X. Jr., Timoney A.G. A comparison of aspiration and sclerotherapy with laparoscopic de-roofing in the management of symptomatic simple renal cysts. *BJU Int.* 2003; 92: 610-613.
- (4) Akinci D., Akhan O., Ozmen M. Long-term results of single-session percutaneous drainage and ethanol sclerotherapy in simple renal cysts. *Eur. J. Radiol.* 2005; 54: 298-302.
- (5) Chung B.H., Kim J.H., Hong C.H., Yang S.C., Lee M.S. Comparison of single and multiple sessions of percutaneous sclerotherapy for simple renal cyst. *BJU Int.* 2000; 85: 626-627
- (6) Kim J.H., Lee J.T., Kim E.K. Percutaneous sclerotherapy of renal cysts with a beta-emitting radionuclide, holmium-166-chitosan complex. *Korean J. Radiol.* 2004; 5: 128-133.
- (7) Madeb R., Feldman P.A., Knopf J., Rub R., Erturk E., Yachia D. Povidone-iodine sclerotherapy is ineffective in the treatment of symptomatic renal cysts. *J. Endourol.* 2006; 20: 402-404.
- (8) Phelan M., Zajko A., Hrebinko R.L. Preliminary results of percutaneous treatment of renal cysts with povidone-iodine sclerosis. *Urology* 1999; 53: 816-817.
- (9) Hanna R.M., Dahniya M.H. Aspiration and sclerotherapy of symptomatic simple renal cysts: value of two injections of sclerosing agents. *AJR Am. J. Roentgenol.* 1996; 167: 781-783.
- (10) Martino P., Annunziata G., Saracino G.A. Aspiration versus aspiration plus ultrasonography-guided alcohol administration for simple renal cysts: recurrence and complications. *Arch. Ital. Urol. Androl.* 2002; 74: 216-218.
- (11) Zerem E., Imamović G., Omerović S. Symptomatic simple renal cyst: comparison of continuous negative pressure catheter drainage and single-session alcohol sclerotherapy. *AJR Am. J. Roentgenol.* 2008; 190: 1193-1197.
- (12) Zerem E., Imamović G., Omerović S. Percutaneous treatment of symptomatic non-parasitic benign liver cysts: single session alcohol sclerotherapy versus prolonged catheter drainage with negative pressure. *Eur. Radiol.* 2008; 18: 400-406.
- (13) Delakas D., Karyotis I., Loumbakis P., Daskalopoulos G., Charoulakis N., Cranidis A. Long-term results after percutaneous minimally invasive procedure treatment of symptomatic simple renal cysts. *Int. Urol. Nephrol.* 2001; 32: 321-326.
- (14) Akinci D., Gumus B., Ozkan O.S., Ozmen M.N., Akhan O. Single-session percutaneous ethanol sclerotherapy in simple renal cysts in children: long-term follow-up. *Pediatr. Radiol.* 2005; 35: 155-158.
- (15) Larssen T.B., Rosendahl K., Horn A., Jensen D.K., Rørvik J. Single-session alcohol sclerotherapy in symptomatic benign hepatic cysts performed with a time of exposure to alcohol of 10 min: initial results. *Eur. Radiol.* 2003; 13: 2627-2632.
- (16) Touloupidis S., Faties G., Rombis V., Papathanasiou A., Balaxis E. Percutaneous drainage of simple cysts of the kidney: a new method. *Urol. Int.* 2004; 73: 169-172.