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Percutaneous treatment of simple renal cyst with autologous blood injection

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Abstract

The aim of this study is to demonstrate the effectiveness of injection of (autologous blood) in the treatment of (simple renal cysts). Forty-one patients with (simple renal cysts) having symptoms, diagnosed by ultrasound were included in this prospective clinical study in which we evaluate the advantage of (renal cyst aspiration) and injection of autologous blood. 26 male and 15 female, the size of cysts were 5-17 cm. A mean age of 59.02+10.85. the majority of cystic lesions were left sided (66%). Seventy-eight percent of lesions were single. The most common site for cystic lesions was the lower pole of the kidney (46%), and 98% of lesions were cortical. The major complication, seen after treatment, was the pain (17%). Other complications comprised hypertension and bleeding. The recurrence rate was 7.32% (3 out of 41). The occurrence of early complication did not predict later recurrence. Inconclusion, (simple renal cyst aspiration) with the injection of autologous blood resulted in high success low recurrence in comparison with (sclerosing agents).

Keywords: Simple renal cyst, Aspiration, Injection of autologous blood

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Introduction

The (simple renal cysts) are acquired benign diseases of the kidneys, they represent 60-75% of the (renal space-occupying) diseases. Causes are unknown, but obstruction of renal tubules and ischemic effect in obstructive area have been postulated. Their incidence steadily raised with grow old, by age of 40 is about 21% while at age 60, it rises to 32%. on the other hand, in as a minimum two studies, men were affected more repeatedly than women [1,2]. The greater part of renal cysts are asymptomatic, they are commonly revealed. Their symptoms: renal pain, elevated blood pressure, hematuria, abdominal swelling, and urinary tract obstruction. They may or may not increase in size with time, 73% remained unaltered in size [3]. Diagnosis is made by ultrasound, computerized tomogram, or IVP. No treatment for (simple renal cysts) is required in asymptomatic patients. Treatment methods

are percutaneous aspiration with or without instillation of sclerosing material, endoscopic resection, and marsupialization, open or laparoscopic surgery. Percutaneous aspiration with instillation of sclerosing substance has been successfully performed with success rates and declining recurrence but not brilliant such laparoscopic deroofing of symptomatic renal cysts. Several sclerosing substances have been used, including glucose, phenol, iophendylate (Pantopaque), acetic acid, povidone-iodine, minocyclinehydrochloride, bismuthphosphate, and absoluteethanol, but none has been adequately striking for its use to become foremost [4]. In one study was compare between cyst aspiration and cyst aspiration with a sclerosing substance was found; the cysts disappeared in 10% of patients if aspiration was only done and the cysts disappeared in 43% of patients when aspiration with the injection of bismuthphosphatewas done [4-5]. A significant proportion of cysts treated by aspiration will reappear [6].

Patients and methods

Forty-one patients with symptomatic (simple renal cysts) diagnosed by ultrasound were included in this prospective clinical study in which we evaluate the benefit of renal cyst aspiration and instillation of autologous blood. The duration of period from March 2014 to February2015. Age of patients were 35-78 years, 26 male and 15 female, the size of cysts was 5-17 cm, 27 in left and 14 in right, 32 cysts were solitary, 19 cysts were lower pole, 13 mid-pole, and 9 uppers.

Procedure

The autologous blood (from the patient himself) injection was performed under ultrasound guidance on an outpatient basis. The patients were placed in the prone position and local anesthesia was achieved with 2% lidocaine hydrochloride that was applied to the puncture site. The patient was given nothing by mouth for 4-8 hours prior to the procedure. Prophylactic antibiotics were administered 60 minutes prior to the procedure, and they were continued for at least 24 hours after the procedure. For all the patients, their coagulopathies were corrected prior to the procedure to decrease the chance of developing a perirenal hematoma or renal hemorrhage. The cyst fluid was aspirated as completely as possible, and it was sent to the laboratory for cytologic and biochemical examination. The total amount of the aspirated fluid was measured to record the cyst's volume. 5-10 ml of autologous blood were injected for each patient. the patients were placed in the prone, supine, and lateral decubitus positions for a minimum of 5 minutes each to allow adequate contact of the blood with all areas of the cyst wall.

Results

The present study included 41 patients with a mean age of 59.02+10.85 and the age range was 35 -78 years. Male to female ratio was 1.73:1. Mean size of renal cystic lesions, measured by ultrasound, was 9.12+3.25 cm. The largest cyst measured 17 cm, while the smallest one measured 5 cm. mean volume of aspirated fluid was 177.68+103.66 and ranged from 35-400 ml. The majority of cystic lesions were left sided (66%). Seventy-eight percent of lesions were solitary. The most frequent location for cystic lesions was the lower pole of the kidney (46%), and 98% of lesions were cortical. These results are shown in table 1.

Table 1.

Age, gender, and characteristic of cystic lesions

Characteristics		Mean +SD, number	Range, %
Age (years)		59.02+10.85	(35-78)
Gender			
	Male	26	(63.41%)
	Female	15	(36.59%)
Size (cm)		9.12+3.25	(5-17)
Volume (ml)		177.68+103.66	(35-400)
Side			
	Left	27	(65.85%)
	Right	14	(34.15%)
Number			
	Solitary	32	(78.05%)
	Multiple	9	(21.95%)
Site			
	Upper	9	(21.95%)
	Middle	13	(31.71%)
	Lower	19	(46.34%)
Cortical			
	Yes	40	(97.56%)
	No	1	(2.44%)

The major complication, seen after treatment, was the pain (17%). Other complications comprised hypertension and bleeding, as shown in table 2.

Table 2.

Complications

Characteristics	Mean +SD, number	Range, %
Pain	7	(17.07%)
Hypertension	1	(2.44%)
Bleeding	1	(2.44%)

The recurrence rate was 7.32% (3 out of 41). Age of the patient, size of the cyst and volume of aspirated fluid were not risk factor for recurrence, as shown in table 3.

Table 3.

Effect of age of patient, size of cyst and volume of aspirated fluid on rate of recurrence

	Recurrence				
	Yes (n =3)		No (n = 38)		
Characteristics	Mean	SE	Mean	SE	P-value
Age	57.33	5.61	59.16	1.79	0.783
Size	10.00	1.00	9.05	0.54	0.633
Volume	248.33	47.64	172.11	16.87	0.225

Gender of the patient also did not affect the rate of the cyst occurrence. The side of the lesion, number, and location (cortical vs. non-cortical) also did not affect the rate of recurrence, as shown in table 4. The occurrence of early complication did not predict later recurrence, as shown in table 4.

Table 4.

Effect of gender of patients, cyst characteristics and occurrence of complications of recurrence rate

Characteristic		Recurrence				
		No		Yes		
		No.	%	No.	%	P-value
gender	Male	23	60.53	3	100.00	0.287
	Female	15	39.47	0	0.00	
side	Left	24	63.16	3	100.00	0.539
	Right	14	36.84	0	0.00	
number	Solitary	30	78.95	2	66.67	0.535
	Multiple	8	21.05	1	33.33	
site	Lower	18	47.37	1	33.33	0.856
	Middle	12	31.58	1	33.33	
	Upper	8	21.05	1	33.33	
cort.vs.non-cortical	cortical	37	97.37	3	100.00	1.000
	non-cor-tical	1	2.63	0	0.00	
Complications						
	Pain	6	15.79	1	33.33	0.870
	Hyper	1	2.63	0	0.00	
	Bleeding	1	2.63	0	0.00	
Total		38	100.00	3	100.00	

Discussion

The simplest approach in the management of (simple renal cyst) is minimally invasive trials. The percutaneous aspiration under the control of ultrasound is a minimally appropriate technique with least complications particularly ultrasound assistance with fewer risk of recurrence.

Percutaneous aspiration of the cyst content itself is the association with a percentage of recurrence because of the cyst wall is covered by secreting epithelium.

Hanna and Steneson reported the recurrence of cysts to their early size in up to 50% if without sclerosing substances [7]. Bean was the former to describe the use of ethanol as a sclerosing material for handling of asymptomatic renal cyst in 1981; since then, a variety of technique for sclerotherapy have been projected. Despite these investigations, the finest agent for renal cyst sclerotherapy remains to be indomitable. Most of sclerosing agents act by either inactivation of sclerosing cells on the cyst and slowly penetrates the fibrous capsule of the cyst-like ethanol or as adhesive glue to the cyst wall like NBCA(N-Butyl cyanoacrylate) decreasing recurrence rate to 30-40%.Okeke and Ozgur in period between 1986-2003 mention the percutaneous aspiration with or without injection of sclerosing agents associated with recurrence rate up to 72% in case of aspiration alone and 58% if aspiration is combined with sclerosing agents [8-19].

Open surgery is now rare because of its invasiveness and more complications regarding wound infection, incisional hernia, pain, and hospital staying with delayed period of recovery period and disfiguring scar.

Laparoscopic procedure is now effective procedure regarding recurrence and hospitalization time but there are risk of vascular and intraperitoneal organ damage and difficulty in kidney mobilization [10-11].

In our study, many variable parameters were occupied such as age of the patients, size, side, site, and number of the cysts in 41 patients and we select this type of procedure (aspiration and injection of autologous blood) as minimal invasive procedure to decrease the complications of more invasive procedures and the result was 17% of patients complaining pain, 2% hypertension, 2% bleeding, 7% recurrence, and these complications are comparable to open or laparoscopic procedures and better than using of sclerosing substances. There were no significant things regarding the parameters of the renal cysts in our procedure as compare with other procedures.

We didn't know the action of injected autologous blood, but it may act as an adhesive substance to the wall of the cyst. We know blood coagulation refers to the process of forming a clot to stop bleeding. The body relies on the interaction of two processes (primary one depends on vasoconstriction and platelet plug) and this process and don't think is related to

adhesive process in the cyst, and (secondary one depends on coagulation cascades by action of factors from I to XIII and the end result of this cascade is that fibrinogen, which is cleaved into fibrin proteins and this stick together forming a clot [12].

The hope in future to use of the sclerotic or adhesive substance resulting in better success and less recurrence after aspiration .

conclusion: (simple renal cyst aspiration) with injection of autologous blood resulted in high success low recurrence in comparison with sclerosing agents.

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