

Special Article - Interventional Radiology

Percutaneous Treatment of Symptomatic Simple Hepatic Cysts

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Introduction

Uncomplicated large hepatic simple cysts may cause nonspecific clinical manifestations because of their size or position, such as discomfort, bulking symptoms, intermittent abdominal pain, early satiety, nausea, vomiting, and obstructive jaundice among others. Both open and laparoscopic cyst removal are considered established treatment options facing increased risk of complications, morbidity and mortality for cysts located in positions difficult to reach (VII, VIII liver segments) [1-6]. The golden standard for surgical management of selected, accessible, symptomatic hepatic cysts is laparoscopy. Laparoscopical management of simple cystic lesions of the liver has complications in 18% of the cases, procedure's conversion up to 23%, reoperation up to 18% and recurrence rate up to 44% [4-6]. Less invasive techniques like imaging guided percutaneous drainage and sclerotherapy are preferable for their management. The aim of this mini-review is to present the current status of percutaneous treatment of symptomatic simple liver cysts as an alternative option to surgery.

Percutaneous treatment techniques

The recurrence rate after percutaneous aspiration and evacuation of simple hepatic cysts is very high (78-100%). The percutaneous drainage methods are effective only if they affect the cysts' epithelial cell lining [7]. Several sclerosing agents have been used, including ethanol, glucose, phenol, iophendylate, pantopaque, minocycline hydrochloride, povidone-iodine, n-butyl cyanoacrylate, holmium-166-chitosan complex, ethanolamine oleate, tetracycline hydrochlorate, doxycycline, hypertonic saline solution, and bleomycin. The sclerosing agent mostly used is ethanol [8-11].

Yoshida et al, (2003) treated 9 patients with solitary hepatic cyst. Minocycline hydrochloride injections were used for the treatment. The hepatic cysts decreased in size and eventually disappeared in all patients. The latter were followed for at least 4 years (mean follow-up 85 months) and no major complications were noted [12].

Yamamoto et al, (2005) treated three patients with simple hepatic cyst. Sclerotherapy was performed with the use of ethanolamine oleate. After therapy, all patients were followed up for at least 3

Abstract

Imaging guided percutaneous treatment of simple, symptomatic, hepatic cyst is currently considered as an alternative treatment option. Although laparoscopy is the gold standard for treatment of these cysts, several studies have shown that percutaneous treatment has even better success rates. Percutaneous treatment prevails in numerous aspects especially concerning life threatening complications and difficult cysts' approaching.

Keywords: Simple cysts; Percutaneous treatment; Sclerotherapy; Liver; Imaging guidance

months. The mean volume reduction rate was 93%. Fever was the only minor complication observed in one patient. Life-threatening complications did not occur [13].

Yang et al, (2006) treated 27 patients with 31 liver cysts. The patients were divided into two groups (n=17 and n=10) according to the time of alcohol retention (4h for the group 1 and 2h for the group 2). The patients were followed-up for a mean period of 29.6 months and the mean reduction of the cyst volume for the two groups was 98.3% and 97.7% respectively. The mean reduction volume rate between the two groups wasn't statistically significant. There weren't any major complications observed except for one patient from the second group who didn't tolerate the sclerotherapy session [14].

Zerem et al, (2008) treated 40 patients with 47 non parasitic liver cysts divided into two groups. One group was treated with alcohol sclerotherapy and the other group with prolonged drainage. The success rates between the two groups did not differ. In the follow-up, two years after treatment, the percentages for complete regression of the cyst for the alcohol sclerotherapy group and the prolonged drainage group were 47.8% and 66.7% respectively. Only minor complications such as fever and drunkenness were observed. No major complications were noted [6].

Nakaoka et al, (2009) treated 13 patients with 17 cysts using ethanolamine oleate. The mean reduction of the hepatic cyst's volume was 88.8%. One week after treatment the mean volume reduction was 62.6%. The respective percentages after 3 months and 1 year of treatment were 84.4% and 96.4%. In this study, only vasovagal attack occurred in one case as a complication and therefore sclerosis session was cancelled. However, there weren't any major or life-threatening complications observed [15].

Souftas et al, (2015) introduced another technique in which the liver cysts were percutaneously approached by the thickest possible liver tissue. Initially, an 8-french pig-tail drained by gravity the cyst's content for 24 hours. On the next day, the integrity of the cyst was documented fluoroscopically by injecting iodinated contrast medium, dissolved in physiological sodium chloride solution (in a quantity of

20–30% of the initial cyst's volume) and mixed with local anesthetic. This dissolution remained for 5min in the cyst. Possible extravasation or communications between the cysts and the biliary tree, the peritoneal cavity or vessels, were also carefully precluded under fluoroscopic control. Subsequently, after the full reabsorption of the above fluid, two injections and reabsorptions of the same quantity (20–25% of the cyst's volume before intervention) of hypertonic NaCl 15% solution were effectuated, followed by three-time repetition of the same procedure with the addition of bleomycin hydrochloride for injection in the solution. The total dose of bleomycin administered to each of the patients was calculated on the basis of the body surface (100mg/m²). A three- to five-minute time of exposure of the cyst's wall to the sclerosants before the reabsorption was considered to be crucial for the adequate contact of the entire cyst's endothelium on them. After the last full reabsorption of the sclerosants, the drainage catheter was removed. The patients remained hospitalized for an additional 12 hours. Follow-up (imaging and clinical) was performed on a 12-month basis. Patients didn't experience any pain during the sclerotherapy session or afterwards. This is attributed to the initial injection of local anesthesia inside the cyst before the sclerosants were administered. Complete relief from the symptoms was achieved for all patients. During both short and long term follow up there were no complications related to the sclerosants observed. In the one-year follow-up, complete regression was observed in 17/19 cysts. Partial regression and near-complete regression was observed in 2 cysts. It is important to mention that the cyst's volume at sixth month and twelfth month does not differ statistically ($p>0.005$). In our department, we kept on applying this method. The sclerotherapy session is always aborted if there is any contrast medium leakage in the peritoneal cavity. The careful use of both bleomycin and hypertonic saline NaCl do not cause any related complications. Current un-published clinical data, on 54 cases in total, show that the technique's success rates remain unchanged. The percentages for complete, near-complete and partial regression of the cysts are 90%, 4% and 6% respectively. The use of both, bleomycin and hypertonic saline NaCl, do not cause any related complications [8].

Conclusion

Percutaneous treatment of simple liver cysts is considered as a safe technique to be performed without limitations in cysts' location. It prevails against surgical treatment not only in morbidity and mortality where its survival rates are excellent, but also in the absence of major complications. Published data show that only minor complications have been observed in a short period after the cysts treatment. The success rates of percutaneous treatment methods are quite high and can establish the latter as a first-choice treatment option. The technique that consists of sclerosants, hypertonic saline NaCl and bleomycin, providing they're carefully used, being painless and very effective, seems to be an attractive treatment option.

References

1. Mazza OM, Fernandez DL, Pekoljetal J, Pfaffen G, Sanchez Clariá R, Molmenti EP, et al. Management of non parasitic hepatic cysts. *J Am Coll Surg*. 2009; 209: 733–739.
2. Lucey BC, Kuligowska E. Radiologic management of cysts in the abdomen and pelvis. *AJR Am J Roentgenol*. 2006; 186: 562–573.
3. Gigot JF, Legrand M, Hubens G, de Canniere L, Wibin E, Deweer F, et al. Laparoscopic treatment of nonparasitic liver cysts: adequate selection of patients and surgical technique. *World J Surg*. 1996; 20: 556–561.
4. Gigot JF, Metairie S, Etienne J, Horsmans Y, van Beers BE, Sempoux C, et al. The surgical management of congenital liver cysts: the need for a tailored approach with appropriate patient selection and proper surgical technique. *Surg Endosc*. 2001; 15: 357–363.
5. Lin TY, Chen CC, Wang SM. Treatment of non- parasitic cystic disease of the liver: a new approach to therapy with polycystic liver. *Ann Surg*. 1968; 168: 921– 927.
6. Zerem E, Imamovic G, Omerovic 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.
7. Saini S, Mueller PR, Ferrucci JT Jr, Simeone JF, Wittenberg J, Butch RJ. Percutaneous aspiration of hepatic cysts does not provide definitive therapy. *AJR Am J Roentgenol*. 1983; 141: 559–560.
8. Souftas VD, Kosmidou M, Karanikas M, Souftas D, Menexes G, Prassopoulos P. Symptomatic abdominal simple cysts: is percutaneous sclerotherapy with hypertonic saline and bleomycin a treatment option?," *Gastroenterol Res Pract*. 2015; 489363.
9. Bean W, Rodan BA. Hepatic cysts: treatment with alcohol. *AJR Am J Roentgenol*. 1985; 144: 237–241.
10. Montorsi M, Torzilli G, Fumagalli U, Bona S, Rosati R, de Simone M, et al. Percutaneous alcohol sclerotherapy of simple hepatic cysts. Results from a multicentre survey in Italy. *HPB Surg*. 1994; 8: 89–94.
11. Larssen TB, Rosendahl K, Horn A, Jensen DK, Rørvik J. Single-session alcohol sclerotherapy in symptomatic benign hepatic cysts performed with a time of exposure to alcohol of 10min:initial results. *Eur Radiol*. 2003; 13: 2627–2632.
12. Yoshida H, Onda M, Tajiri T, Arima Y, Mamada Y, Tani N. Long-term results of multiple minocycline hydrochloride injections for the treatment of symptomatic solitary hepatic cyst. *J Gastroenterol Hepatol*. 2003; 18: 595–598.
13. Yamamoto K, Sakaguchi H, Anai H, Tanaka T, Morimoto K, Kichikawa K. Sclerotherapy for simple cysts with use of ethanolamine oleate: preliminary experience. *Cardiovasc Intervent Radiol*. 2005; 28: 751–755.
14. Yang CF, Liang HL, Panetal HB, Lin YH, Mok KT, Lo GH, et al. Single-session prolonged alcohol-retentions sclerotherapy for large hepatic cysts. *AJR Am J Roentgenol*. 2006; 187: 940–943.
15. Nakaoka R, Das K, Kudo M, Chung H, Innoue T. Percutaneous aspiration and ethanolamine oleate sclerotherapy for sustained resolution of symptomatic polycystic liver disease: an initial experience. *AJR Am J Roentgenol*. 2009; 193: 1540–1545.