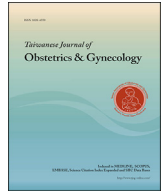




Contents lists available at ScienceDirect

## Taiwanese Journal of Obstetrics &amp; Gynecology

journal homepage: [www.tjog-online.com](http://www.tjog-online.com)

## Original Article

## Evaluation of sclerotherapy for the treatment of infected postoperative lymphocele

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## ARTICLE INFO

## Article history:

Accepted 3 October 2016

## Keywords:

Infection  
Lymphocele  
Sclerotherapy  
Catheterization

## ABSTRACT

**Objective:** To evaluate the efficacy and safety of sclerotherapy as the treatment of infected postoperative lymphocele in gynecologic malignancy patients.**Materials and methods:** Percutaneous catheter drainage (PCD) with or without sclerotherapy was performed for postoperative lymphocele in 75 patients from 2002 to 2014. Eighty-eight lymphoceles (43 non-infected as group A, 45 infected as group B) in 75 patients (mean age  $\pm$  SD; 50.3  $\pm$  11.3) were included. Sclerotherapy was performed in 17 (39.5%, group A-S) lymphoceles in group A and 14 (31.1%, group B-S) in group B. Absolute ethanol was the most frequently used sclerosant (28 of total 36 sessions). Mean follow-up period was 37 months (range: 1–154).**Results:** Sclerotherapy was clinically successful in 13 lymphoceles in both group A-S (76.5%) and group B-S (92.9%) without statistical significance. Compared to the pre-sclerotherapy period, group B-S demonstrated significantly decreased drainage volume after sclerotherapy (662.7 ml vs. 100.6 ml,  $p = 0.019$ ). Group A-S failed to demonstrate significant decrease in drainage volume after sclerotherapy. Recurrence occurred in 4 patients in group A-S and 1 in group B-S, without statistical significance. No major complication was noted.**Conclusion:** Sclerotherapy significantly reduces the drainage volume, and might help shorten catheter placement time in infected lymphoceles.© 2017 Taiwan Association of Obstetrics & Gynecology. Publishing services by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

Lymphocele is an abnormal collection of lymphatic fluid that usually develops after surgery involving lymphadenectomy of the pelvis. It is different from a true cyst in that its fibrotic wall lacks an epithelial lining [1]. The incidence of postoperative lymphocele reportedly ranges from 8 to 48% after pelvic lymphadenectomy [2]. Since most lymphoceles are asymptomatic and resolve spontaneously, they are not indications for treatment [1–3]. A minority of lymphoceles, ranging from 4 to 7%, persist and cause symptoms due to compression of adjacent structures and in some cases become

infected leading to fever, tenderness, leg swelling or even sepsis and death [1,2].

Initially, the treatment for symptomatic lymphoceles was surgical marsupialization, first by open surgery and later by laparoscopic surgery. Successful percutaneous catheter drainage (PCD) was first reported by Aronowitz and Kaplan in 1983 [4] and has since become the first line treatment method in many institutions [1]. The addition of sclerotherapy with variable agents is reportedly effective in certain non-infected lymphoceles, as compared to PCD alone [1,2,5–8]. However, the treatment of infected lymphoceles is a less-discussed topic in the literature, especially with regards to the use of sclerotherapy in addition to PCD.

The objective of this study was to assess the efficacy and safety of sclerotherapy after PCD as treatment of infected lymphoceles in patients who received pelvic or abdominal surgery for gynecologic malignancies, as compared to treatment with PCD without sclerotherapy.

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## Materials and methods

Approval of the Institutional Review Board was obtained. The database of patients who received PCD with or without sclerotherapy for the treatment of lymphoceles that developed after surgery for gynecologic malignancy from March 2002 to December 2014 at 2 tertiary referral hospitals was retrospectively reviewed. The diagnosis of a lymphocele was based on postoperative imaging findings of a walled-off lobulated fluid collection with or without septa at the site of surgery. A lymphocele was considered infected in the following cases: grossly purulent initially drained fluid from PCD, positive fluid culture, suspicious infection sign on computed tomography such as irregular thickness and enhancing wall with surrounding infiltration, and fever and laboratory results implying inflammation (leukocytosis and elevated c-reactive protein) without any other identifiable cause. Patients were divided into 4 groups according to the infection status of the lymphocele and whether sclerotherapy was performed. Demographics, procedural details, complications and recurrence rates were analyzed for each group. The analyzed procedural details included catheter placement time, drainage volume and period from operation to lymphocele detection. For patients who received sclerotherapy, the drainage volume was analyzed for the pre- and post-sclerotherapy period.

Technical success for PCD was defined as the successful insertion of PCD without immediate complications such as excessive bleeding and technical success for sclerotherapy was defined as completion of sclerotherapy without visible leakage. Clinical success for both PCD and sclerotherapy was defined as resolution of a lymphocele during the entire follow-up period. Resolution was defined as total non-visualization of the lymphocele after treatment on computed tomography or decrease to a minimal size with no symptoms. Recurrence was defined as increased size of a lymphocele with relevant symptoms after a period of resolution and removal of the PCD catheter.

## Patients

Eighty-eight lymphoceles in 75 patients (mean age  $\pm$  SD;  $50.3 \pm 11.3$ ) were included (Table 1). Forty-three lymphoceles in 36 patients were non-infected (group A, mean age  $\pm$  SD;  $50.6 \pm 12.7$ ) and 45 lymphoceles in 41 patients were infected (group B, mean

age  $\pm$  SD;  $49.9 \pm 10.0$ ). Two patients had both a non-infected and infected lymphocele. Ovarian cancer and cervical cancer were the most common underlying malignancy in each group (group A 38.9% vs. group B 43.9%), respectively.

## PCD and sclerotherapy

Both procedures were performed in the interventional radiology room under sonographic and/or fluoroscopic guidance.

In group A, sclerotherapy was performed in 17 lymphoceles (39.5%, group A-S) and PCD alone was performed in 26 (60.5%, group A-P). In group B, sclerotherapy was performed in 14 lymphoceles (31.1%, group B-S) and PCD alone was performed in 31 (68.9%, group B-P) (Table 1).

Sclerotherapy was indicated in addition to PCD in various situations including, no change or increased amount of daily drainage volume from PCD catheter, no change of or increased size of lymphocele in follow-up imaging, prolonged catheter maintenance, and, and severe symptoms of patient. Sclerotherapy was performed on the same day as PCD insertion on 7 lymphoceles in 5 patients (group A-S; 5 lymphoceles in 3 patients, group B-S; 2 lymphoceles in 2 patients) as a policy of a specific interventional radiologist. Other sclerotherapy sessions were performed at varying intervals from PCD insertion. For infected lymphoceles, sclerotherapy was performed after confirmation of decreased purulence of drained lymphocele fluid or improvement of clinical symptoms or lab findings. The lymphoceles of the 2 patients in group B-S who received PCD and sclerotherapy on the same day where not suspected of infection at the time of procedure, and confirmation of infected lymphocele was made via lymphocele fluid analysis.

In total, 36 sessions of sclerotherapy were performed in 31 lymphoceles. Three sessions were performed on a single lymphocele in 1 patient in group A-S. Two sessions were performed on a single lymphocele in 3 patients in group A-S, respectively. For all 14 lymphoceles in group B-S and the remaining 13 lymphoceles in group A-S, 1 session of sclerotherapy was performed. In the 36 sclerotherapy sessions, absolute ethanol was the most frequently used sclerosant (28 sessions), followed by 30% povidone-iodine (4 sessions), 50% acetic acid (3 sessions), and 3% sodium tetradecyl sulfate (1 session). Sclerosants were chosen based on the patient's known past history of hypersensitivity to a sclerosant and familiarity of the interventionist with a specific sclerosant. Of the 28

**Table 1**  
Characteristics of patients.

	Non-infected (Group A)		Infected (Group B)		p Value
	Sclerotherapy (Group A-S)	PCD <sup>a</sup> (Group A-P)	Sclerotherapy (Group B-S)	PCD (Group B-P)	
Number of patients	36 <sup>b,c</sup>	13 <sup>a</sup>	41 <sup>c</sup>	12	
Mean age $\pm$ SD <sup>d</sup>	50.69 $\pm$ 12.73		49.95 $\pm$ 10.05		>0.05
Gynecologic malignancy					>0.05
Ovary cancer	14	5	17	3	
Endometrial cancer	13	9	6	4	
Cervical cancer	5	8	2	4	
Cervical cancer	9	3	18	7	
Cervical cancer	3	6	7	11	
Number of lymphoceles	43		45		
Interval from operation to detection of lymphoceles (days)	17 (39.55)	26 (60.5%)	14 (31.1%)	31 (68.9%)	>0.05 <sup>e</sup>
Interval from operation to detection of lymphoceles (days)	67.3 $\pm$ 60.94		73.67 $\pm$ 78.5		>0.05

<sup>a</sup> Percutaneous drainage.

<sup>b</sup> One patient had 2 noninfected lymphoceles; 1 was treated with PCD alone, one was treated with PCD and sclerotherapy.

<sup>c</sup> Two patients had both infected and noninfected lymphoceles.

<sup>d</sup> Standard deviation.

<sup>e</sup> Compared between group A-S and group A-P, and between group B-S and group B-P.

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