Lymphatic Embolization for the Treatment of Pelvic Lymphoceles: Preliminary Experience in Five Patients

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ABSTRACT

Purpose: To retrospectively assess the outcome of lymphatic embolization in the treatment of pelvic lymphoceles.

Materials and Methods: From July 2014 to December 2015, a retrospective analysis was performed in 5 consecutive female patients (mean age, 54.6 y; range, 45–65 y) who underwent lymphangiography for the management of symptomatic pelvic lymphoceles that developed after gynecologic surgery. Sclerotherapy had failed in 4 patients. Lymphangiography was performed through an inguinal lymph node to reveal disrupted lymphatic vessels draining into the lymphocele. This inflow vessel was targeted with a fine needle, and *N*-butyl cyanoacrylate (NBCA) was injected. Outcomes and complications were assessed by reviewing electronic medical records and computed tomography (CT).

Results: Lymphangiography revealed disrupted lymphatic vessels draining into the lymphocele in all patients. A single inflow vessel was seen in 3 patients and was subsequently embolized. Catheters were successfully removed upon decrease of drainage. Multiple inflow vessels were seen in the remaining 2 patients. Therapeutic effect was anticipated in 1 patient after lymphangiography alone, whereas only the dominant feeding vessel was embolized in the other. The initial procedures failed in both patients, prompting repeat embolization with adjunctive sclerotherapy. Both patients showed improvement and had their catheters removed. Follow-up CT was available in 3 patients. Two patients showed complete regression of lymphoceles, and 1 showed an asymptomatic lymphocele. No procedure-related complications occurred during a mean follow-up period of 35 weeks (range, 2–73 wk).

Conclusions: Lymphatic intervention was technically feasible in treating lymphoceles. However, those with multiple inflow vessels were relatively difficult to treat.

ABBREVIATION

NBCA = *N*-butyl cyanoacrylate

A lymphocele is a localized accumulation of lymphatic fluid without an epithelial wall, which has been reported to develop in as many as 30% of patients who have undergone lymphadenectomy during pelvic surgery (1–3). Although a large number of postsurgical lymphoceles remain asymptomatic, some lymphoceles may be complicated by secondary infection or continue to expand, eventually causing compression of surrounding organs or vessels (4,5). Symptomatic lymphoceles can be drained by percutaneous catheter insertion, but 23%–50% of lymphoceles have been reported to reexpand after removal of the catheter (1,5). To lower the recurrence rate, sclerotherapy may be adjunctively performed with the use of various sclerosant agents such as ethanol, acetic acid, povidone-iodine, and bleomycin (1,3,6). The reported success rate of sclerotherapy for lymphoceles ranges between 79% and 94% (1,7,8). However, sclerotherapy occasionally fails despite repeated sessions and use of different sclerosant agents.

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Although the cause of treatment failure cannot always be ascertained, it has been proposed that sclerotherapy is more likely to fail in cysts of large size (9). Shih et al (9) described a case in which a lymphocele failed to respond to sclerotherapy but was cured by ligation of the inflow lymphatic vessel. Here we describe our preliminary experience with percutaneous embolization of the lymphatic vessel feeding the lymphocele with the use of *N*-butyl cyanoacrylate (NBCA).

MATERIALS AND METHODS

The electronic database was searched for patients who underwent lymphangiography for the treatment of lymphocele between July 2014 and December 2015. The search revealed five consecutive patients who were included in this retrospective review. Approval from the hospital's institutional review board was obtained, and the requirement for patient consent was waived.

Patients

Demographic data and clinical information for the five patients are presented in Table 1. All patients were women who had previously undergone pelvic surgery for gynecologic malignancies. Their mean age was 54.6 years (range, 45–65 y). As a common clinical feature, the patients described abdominal distension; one also had urinary incontinence. Computed tomography (CT) in all patients revealed formation of cystic masses attached in part to at least one side of the pelvic wall where the surgery had been performed. One patient showed the presence of hydronephrosis secondary to extrinsic compression of the ureter by the lymphocele. Whereas this patient was initially referred for lymphangiography to verify the diagnosis of lymphocele, the other four patients were referred for definitive lymphatic treatment after multiple failed attempts at sclerotherapy. The numbers of sclerotherapy sessions and type of sclerosant agents used are summarized in Table 1. All five patients had indwelling catheters placed within the lymphoceles for evacuation of fluid, which was clear and/or straw-colored. Table 1 includes data regarding the amount of daily drainage through the catheters.

Lymphatic Intervention

Diagnostic lymphangiography was initially performed via the largest inguinal lymph node located ipsilateral to the pelvic lymphocele. A high-frequency (7–15 MHz) linear transducer (HD 11 XE; Philips, Amsterdam, The Netherlands) was used to scan the inguinal area. Under ultrasound (US) guidance, a 25-gauge needle was used to puncture the lymph node, after which Lipiodol (Guerbet, Roissy, France) was injected manually at a rate of approximately 0.5 mL/min under real-time fluoroscopic guidance. The Lipiodol was traced on fluoroscopy as it flowed through the pelvic lymphatic system. The lymphatic vessel of interest was the one that showed extravasation of Lipiodol droplets that collected within the lymphocele. Review of cavitograms acquired during the earlier sclerotherapy procedures confirmed the location of these oily droplets to be within the boundaries of the lymphoceles.

The disrupted lymphatic vessel was then targeted with a 22-gauge needle under fluoroscopic guidance (Fig 1c, e). Rotation of the C-arm in oblique lateral projection allowed verification of the location of the needle tip. When the tip of the needle penetrated the feeding vessel, NBCA (B. Braun, Melsungen, Germany) mixed with Lipiodol at a ratio of 1:1 was injected at the puncture site with the intent to occlude the lymphatic inflow into the cyst. The bolus of NBCA mixture was visualized under fluoroscopy as it was injected, and injection was continued until the bolus spilled into the lymphocele cavity. At this point, the needle was immediately removed. No further procedures were done to assess the effect of embolization; instead, the outcome was determined by monitoring the daily amount of drainage. Follow-up CT images of three patients were reviewed to assess long-term outcomes. Imaging studies were not available for review in two patients.

RESULTS

On lymphangiography, lymphatic feeding vessels draining into the pelvic lymphoceles were demonstrated in all five patients (Table 2). Three patients (patients 1, 2, and 3) showed a single feeding vessel, and two (patients 4 and 5) showed multiple feeding vessels (Fig 2). As a common feature, Lipiodol droplets were seen to leak from disrupted lymphatic vessels and gather within the confined space of the lymphocele, forming a conglomeration of oily droplets (Fig 1c). Fluid samples drawn from the catheter at this stage revealed oily droplets on the surface of the aspirated fluid, thereby confirming the presence of communication between the lymphatic system and cystic lesion of interest (Fig 1d).

In the three patients who showed a single feeding vessel draining into the lymphocele, the vessel was successfully targeted under fluoroscopic guidance. Following a single session of percutaneous embolization with NBCA, these patients showed a response to treatment (Table 2), allowing for the catheter to be removed. In the remaining two patients who showed leaks from multiple lymphatic vessels, total exclusion of the lymphocele from all possible inflow was deemed technically difficult. In one of these patients (patient 4), therapeutic effect of lymphangiography alone was anticipated, and therefore NBCA injection was not attempted. In the other patient (patient 5), only the