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A prospective study examining the incidence of asymptomatic and symptomatic lymphoceles following lymphadenectomy in patients with gynecological cancer

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HIGHLIGHTS

- Lymphocele develops in one fifth of patients after lymphadenectomy.
- Symptomatic lymphocele is a rare event affecting 5–6% of patients.
- Risk factors for lymphocele development are not preventable.

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ABSTRACT

Objective. To identify the incidence of asymptomatic and symptomatic (i.e., causing pain, hydronephrosis, venous thrombosis, acute lymphedema of the lower or urinary urgency) lymphoceles, as well as risk factors for their development, through a prospective study of patients undergoing sole pelvic or combined pelvic and paraaortic lymphadenectomy for gynecological cancer.

Methods. Patients with endometrial, ovarian or cervical cancer scheduled for sole pelvic or combined pelvic and paraaortic lymphadenectomy as a primary surgical treatment or salvage surgery for recurrence were enrolled at single institution from February 2006 to November 2010 and prospectively followed up with ultrasound.

Results. Of 800 patients who underwent sole pelvic or combined pelvic and paraaortic lymphadenectomy for gynecological cancer, the overall incidence of lymphoceles was 20.2%, with symptomatic lymphoceles occurring in 5.8% of all patients. Lymphoceles are predominantly located on the left pelvic side wall. Lymphadenectomy in ovarian cancer, a higher number of lymph nodes obtained (>27), and radical hysterectomy in cervical cancer were found to be independent risk factors for the development of symptomatic lymphoceles.

Conclusions. The overall incidence of lymphocele development after lymphadenectomy for gynecological cancer remains high. However, the majority of lymphoceles are only incidental finding without clinical impact. A symptomatic lymphocele is an uncommon event, occurring in only 5.8% of patients. Symptomatic lymphoceles tend to develop earlier than asymptomatic. Although such risk factors are hard to avoid, patients known to be at an increased risk of developing symptomatic lymphoceles can be counseled appropriately and followed up for specific symptoms relating to lymphocele development.

Introduction

Lymphocele formation is a complication that occurs following lymphadenectomy due to gynecological or urological malignancy, or after renal transplantation [1–3]. In 1955, Mori published a case series describing the occurrence of 68 lymphoceles following radical hysterectomy and lymphadenectomy for cervical cancer [4]. In 1961, Ferguson and MacClure [5] confirmed that lymphoceles are a complication of the lymphatic system, when a contrast agent injected into a lymphatic vessel penetrated into the lymphocele.

The majority of lymphoceles are asymptomatic and are often an incidental finding during postoperative or routine follow-up. Reports of the incidence of asymptomatic lymphoceles following oncogynecological procedures involving lymphadenectomy range from 1% to 58% [4,6–8].

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If symptomatic, lymphocele may result in significant postoperative morbidity and may even delay further cancer treatment. A symptomatic lymphocele may compress adjacent structures (ureters, urinary bladder, rectum or large vessels) and consequently cause pain, hydronephrosis, urinary urgency or thrombosis. The most serious complication of lymphocele is infection [8–13].

An injury to the lymphatic vessels is the key causative factor in the formation of a lymphocele. Recent research has looked to identify potential risk factors which may increase the risk of lymphocele formation after lymphadenectomy [14]. Surgical approach (laparotomy vs. laparoscopy), number of lymph nodes harvested, lymph nodes status, type of cancer, body mass index (BMI), preoperative or adjuvant radiotherapy and chemotherapy are factors discussed as potential risk or protective factors for lymphocele development.

The aim of this study was to analyze the incidence of symptomatic and asymptomatic lymphoceles and assess the risk and protective factors for lymphocele formation in the largest cohort of patients that has been followed prospectively after pelvic and/or paraaortic lymphadenectomy for gynecological malignancy, to date.

Methods

Study design and patient population

Patients with endometrial, ovarian or cervical cancer who were scheduled for sole pelvic or combined pelvic and paraaortic lymphadenectomy as a primary surgical treatment or salvage surgery for recurrence were enrolled at one institution from February 2006 to November 2010. Enrollment continued until 800 patients were prospectively enrolled and reached at least one follow-up visit.

Patients were excluded from the final analysis set if they were not operated on as scheduled, if either pelvic or paraaortic lymphadenectomy was not performed according to the protocol, or if they did not attend at least one follow-up visit (Fig. 1).

All patients who underwent lymphadenectomy as scheduled and who were not excluded were scheduled for regular follow-up visits at 3-month intervals (±1 month) for 2 years as per the institution's follow-up protocol (according our institution´s guidelines, every patient after surgical staging undergoes ultrasound examination every 3 months) or as required in case of presentation of symptoms.

All symptoms were carefully registered at each follow-up visit. If symptoms occurred in any patient with a lymphocele and the nature of their symptoms could be attributed to its presence, the lymphocele was considered to be symptomatic. The following symptoms were considered potentially related: pain located to the site of lymphocele, hydronephrosis, urinary urgency, venous thrombosis and acute lymphedema of the lower extremity.

This study has been approved by a local ethical committee and all patients gave their informed consent.

Surgical procedures and techniques

Performance of both pelvic and paraaortic lymphadenectomy was precisely standardized. Lymphadenectomy performance was not changed during the study period and was identical for all cancer types [15].

Procedures were done either by laparotomy or laparoscopy. Surgery was undertaken by one of four experienced gynecological oncologists. Pelvic lymphadenectomy started with opening of retroperitoneum parallel to the external and common iliac vessels above the psoas muscle. Lymphatic tissue was removed from the external iliac, common iliac, obturator and interiliac regions by monopolar and bipolar coagulation from the vena circumflexa ilium profunda (caudal limit) up to the aortic bifurcation (cranial limit). Lymphatic tissue from the presacral region was removed separately as a part of paraaortic lymphadenectomy or in cases of cervical cancer as a part of pelvic lymphadenectomy.

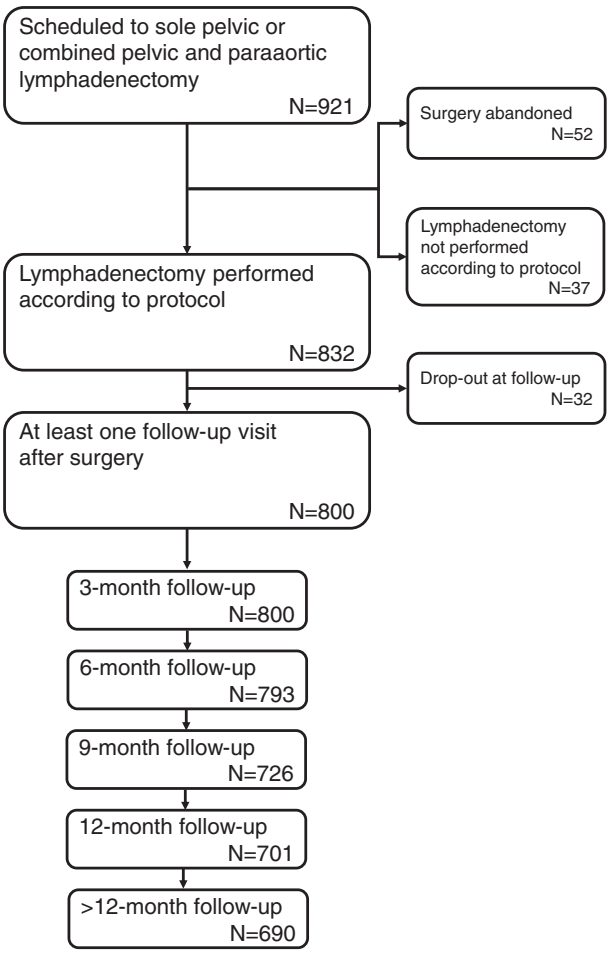

Fig. 1. Study design and patient flow.

For paraaortic lymphadenectomy, the procedure commences with the opening of the retroperitoneum along the root of the mesentery. The aorta and vena cava were identified as well as the ureters, ovarian veins, inferior mesenteric artery and renal veins. Lymphatic tissue was removed from the paracaval, interaortocaval, paraaortic and presacral regions. The caudal limit of dissection was the bifurcation of the aorta, with the cranial limit being the level of both renal veins.

Identical extend and performance was used for laparoscopic approach. In all laparoscopic cases, transperitoneal access was used.

The peritoneum was left open after surgery and a suction drain was inserted into the pelvis through the abdominal wall in all (either laparotomic or laparoscopic) cases and was removed third postoperative day. A single dose of prophylactic antibiotics was administered intraoperatively.

Imaging

Transabdominal and transvaginal or transrectal ultrasound was undertaken according to institutional follow-up guidelines. Examinations were performed by one of three gynecological oncologists experienced in the field of ultrasound diagnostics. GE Logiq 9 or GE 8 instruments in B-mode and power Doppler mode were used.

Examination began with transabdominal evaluation of the parenchymatous organs. The superior mesenteric artery was followed into the mesenteric branches in order to check the root of the mesentery. The retroperitoneum was screened in longitudinal and transversal sections from the coeliac trunk to the bifurcation of aorta. Subsequently, both groin and iliac vessels were examined upward from the femoral