Chylous Ascites After Post-Chemotherapy Retroperitoneal Lymph Node Dissection: Review of the M. D. Anderson Experience

James G. Evans, Philippe E. Spiess, Ashish M. Kamat,* Christopher G. Wood, Mike Hernandez, Curtis A. Pettaway, Colin P. N. Dinney† and Louis L. Pisters‡,§

From the Departments of Urologic Oncology, and Biostatistics and Applied Mathematics (MH), University of Texas M. D. Anderson Cancer Center, Houston, Texas

Purpose: We determined the clinical presentation, risk factors and optimal treatment of chylous ascites that develop after retroperitoneal lymph node dissection in patients with testicular cancer.

Materials and Methods: We retrospectively reviewed the records of 329 patients who underwent post-chemotherapy retroperitoneal lymph node dissection at our institution, of whom 23 (7%) had chylous ascites postoperatively. Clinical and pathological parameters were entered into a database.

Results: Mean patient age at chylous ascites presentation was 32.1 years. On univariate and multivariate logistic regression analyses increasing amounts of preoperative chemotherapy (OR 1.24) and intraoperative blood loss (OR 1.33) were predictive of chylous ascites. The clinical presentation of chylous ascites consisted of abdominal fullness and distention in all patients. Initial treatment was paracentesis alone or combined with total parenteral nutrition in 77% of patients. An abdominal drain was used for persistent ascites in 10 patients. In patients treated conservatively the rate of resolution of chylous ascites was 77%. Only 23% of patients required peritoneovenous shunt placement. However, shunt use was associated with an 80% surgical revision rate.

Conclusions: Conservative treatment resolves most cases of postoperative chylous ascites. An abdominal catheter drain should be considered for significant or recurring chylous ascites. When a peritoneovenous shunt is required, it may be needed for an extensive period for resolution and there are significant complications associated with its use. Increasing amounts of preoperative chemotherapy and operative blood loss raise the likelihood of chylous ascites.

Key Words: testis, testicular neoplasms, chylous ascites, lymph node excision, postoperative complications

The surgical management of testicular cancer with RPLND has potential significant risks and complications. One such complication is chylous ascites, which is characterized by the accumulation of chylous fluid in the peritoneal cavity.[1] Postoperatively chylous ascites usually develops as a result of surgical trauma to the lymphatic system (thoracic duct, cisterna chyli or one of its major tributaries) combined with increased chyle production and obstruction to the lymphatic drainage from the abdomen.[2,3] Chylous ascites is an infrequent postoperative complication of major abdominal and retroperitoneal surgical procedures with a frequency of 1/20,464 hospital admissions in a retrospective series by Press et al.[4] In a study of Baniel et al of 603 patients who underwent post-chemotherapy RPLND the incidence of chylous ascites was 2%.[5] Despite its infrequent occurrence postoperative chylous ascites is associated with significant morbidity.

We retrospectively reviewed our institutional experience with patients in whom chylous ascites developed after post-chemotherapy RPLND. We identified risk factors for this condition and determined the most beneficial management of this surgical complication.

MATERIALS AND METHODS

Study Design

A retrospective chart review protocol was approved by our Institutional Review Board before performing this study. Using our tumor registry 329 males with primary testicular cancer were identified from January 1980 to July 2003 who had undergone a post-chemotherapy RPLND. Chylous ascites developed in 23 patients (7%), in whom we performed an in-depth chart review of preoperative and postoperative clinical, pathological and surgical parameters. To maintain patient confidentiality all patient identifiers were removed during data acquisition. Clinical staging was based on the 1997 TNM staging system. In all cases a complete medical evaluation, including the serum tumor markers α-fetoprotein, β-HCG and LDH, and radiological evaluation, including chest and abdominal/pelvic CT, were performed. Clinical variables, including clinical presentation, diagnostic modality, treatment and patient outcome, were recorded, as were

Submitted for publication October 4, 2005.
Study received Institutional Review Board approval.

* Financial interest and/or other relationship with Healthgate, Pharmachira and Abbott.

† Financial interest and/or other relationship with AstraZeneca, GlaxoSmithKline, National Cancer Institute, Canji/Schering-Plough and Abbott/Vysis.

‡ Financial interest and/or other relationship with Abbott and Endocare.

§ Correspondence: Department of Urology, University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Blvd., Unit 1373, Houston, Texas 77030 (telephone: 713-792-3250; e-mail: Lpisters@mdanderson.org).

DOI:10.1016/j.juro.2006.06.016

TABLE 1. *Patient characteristics*

Variable	Chylous Ascites		p Value
	No	Yes	
No. pts	306	23	
Mean age at presentation (yrs)	27.0	32.1	0.016 (Wilcoxon rank sum test)
No. testicular mass side (%):			1.000 (Fisher's exact test)
Rt	153 (50)	12 (52)	
Lt	153 (50)	11 (48)	
No. clinical stage (%):			0.038 (Fisher's exact test)
I	72 (24)	0	
IIA	32 (10)	2 (8)	
IIB	64 (21)	5 (22)	
IIC	50 (16)	3 (13)	
III	88 (29)	13 (57)	
Median serum tumor markers at presentation (range):			
α-Fetoprotein (ng/ml)	51.3 (0–65,255)	818.5 (2.5–11,200)	0.069 (Wilcoxon rank sum test)
β-HCG (mIU/ml)	11.7 (0–600,065)	419 (1–160,000)	0.200 (Wilcoxon rank sum test)
LDH (IU/l)	341 (42–8,856)	451 (260–5,334)	0.060 (Wilcoxon rank sum test)
Median No. preop chemotherapy cycles (range)	4 (2–20)	5 (2–16)	0.001 (Wilcoxon rank sum test)
Median cm preop retroperitoneal mass diameter (range)*	4 (1–30)	4 (4–25)	0.954 (Wilcoxon rank sum test)

* Not available in 124 patients.

intraoperative and postoperative surgical variables. The largest preoperative circumferential diameter of retroperitoneal disease on abdominal imaging was noted. All pathological specimens from the testis primary lesion and the retroperitoneum or other metastatic sites were reviewed by a genitourinary pathologist at our institution. Resolution of chylous ascites was determined as having occurred when patients were 1) no longer receiving active treatment for chylous ascites, 2) tolerating a regular diet without abdominal distention or discomfort and 3) no longer having any form of abdominal drain.

Statistical Analysis

The Wilcoxon rank sum test was used to compare the medians of continuous variables and the Fisher exact test was used to compare categorical variables across patients who did and did not have chylous ascites. Univariate and multivariate logistic regression analysis was performed with backward selection and with the significance level for removal from the model at 0.05. The final model included an increasing number of preoperative chemotherapy cycles ($p = 0.027$) and intraoperative blood loss ($p = 0.001$). As a measure of goodness of fit we determined the Hosmer-Lemeshow goodness of fit statistic. The value of the Hosmer-Lemeshow fit statistic was 8.67 in the multivariate model with a corresponding significance of $p = 0.371$, indicating that we had no statistical evidence that the model did not fit the data. An ROC curve was determined as a measure of discrimination of the likelihood that a patient who presented with postoperative chylous ascites would have a higher predicted probability of having chylous ascites than a patient who did not present with chylous ascites postoperatively. The area under the ROC curve was approximately 0.77, which we considered acceptable discrimination. For all statistical analyses $p < 0.05$ was considered significant.

RESULTS

Clinical Presentation

Mean patient age at presentation was 32.1 years (median 34) (table 1). Most patients presented with advanced clinical stage, including clinical stage III in 57%. Median serum tumor markers at diagnosis were α-fetoprotein 818.5 ng/ml, β-HCG 419 mIU/ml and LDH 451 IU/l. Testicular neoplasms

TABLE 2. *Surgical parameters in patients with chylous ascites*

Variable	Chylous Ascites		p Value
	No	Yes	
No. pts	306	23	
Median hrs operative time (range)	5.4 (1.4–22.2)	10.8 (4.4–16.5)	<0.001 (Wilcoxon rank sum test)
Median cc blood loss (range)	750 (50–11,000)	1930 (200–12,000)	<0.001 (Wilcoxon rank sum test)
% Transfusion	61.6	87	0.014 (Fisher's exact test)
No. operation type (%):			0.749 (Fisher's exact test)
Full bilat template	274 (89)	22 (96)	
Lt template	30 (10)	1 (4)	
Rt template	2 (1)	0	
No. Concomitant procedure at RPLND (%):			0.729 (Fisher's exact test)
Lung resection	1 (0.5)	0	
Orchiectomy	10 (3)	3 (13)	
Nephrectomy/adrenalectomy	12 (4)	2 (9)	
Hemiscrotectomy	4 (1)	0	
Two or more	10 (3)	1 (4)	
No. major intraop complications (%)	10 (3)	1 (4)	0.555 (Fisher's exact test)
No. retroperitoneal mass pathology (%):			0.019 (Fisher's exact test)
Viable germ cell tumor	96 (31)	3 (13)	
Teratoma	69 (23)	11 (48)	
Fibrosis	141 (46)	9 (39)	