

EMPHYSEMATOUS CYSTITIS: AN UNREPORTED COMPLICATION AFTER PANCREATICODUODENECTOMY

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EMPHYSEMATOUS CYSTITIS: AN UNREPORTED COMPLICATION AFTER PANCREATICODUODENECTOMY (Abstract): Pancreaticoduodenectomy was associated with an increased morbidity, and septic complications are the primary cause of death in these patients. However, severe sepsis, caused by a postoperative urinary tract infection, is uncommon. It is presented the case of a 72 years old man, with a pylorus-preserving pancreaticoduodenectomy for an ampullary adenocarcinoma. Postoperatively, the patient developed a chyle leak, and a severe urinary tract infection (i.e., emphysematous cystitis), with septic shock. The diagnosis, management and outcome are discussed. In conclusion, emphysematous cystitis is a potentially life-threatening complication, which may occur due to the postoperative immunodepression after pancreaticoduodenectomy. **Keywords:** PANCREATICTOMY, COMPLICATION, CHYLE LEAK, IMMUNODEPRESSION, EMPHYSEMATOUS CYSTITIS.

Emphysematous cystitis is an acute infection, characterized by the presence of the gas into the walls of the urinary bladder (1). Pancreaticoduodenectomy is a complicated surgical procedure, which is associated with increased morbidity (2). Infectious complications after pancreatectomies are encountered in around 30% of the patients (3). Septic complications represent the primary cause of death after pancreaticoduodenectomy, and in most of the cases are consequences of a postoperative pancreatic fistula (3). Urinary tract infections after pancreatico-duodenectomy are encountered in 7% of the patients, but extremely rarely may lead to septic complications (3).

CASE REPORT

A 72 years old man, with no significant medical history, underwent a pylorus-preserving pancreaticoduodenectomy, with standard lymph nodes dissection(2), for an ampullary tumor. The pathology report showed an ampullary adenocarcinoma, pT1, pN0 (17 lymph nodes retrieved). The postoperative outcome was complicated with a chyle leak, which occurred two days (postoperative day 4) after starting the enteral feeding on the naso-jejunal tube, which was intraoperatively mounted. The triglycerides level in the abdominal drainage fluid was 253 mg/ dL, with normal levels for amylase and lipase. Postoperatively, the patient had spontaneous normal

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glycaemia levels. Total parenteral nutrition was initiated, along with fasting and octreotide administration, with apparently favorable outcome (decrease of the daily drainage from 7 liters/day to 1 liter/day). On postoperative day 36 fevers appeared, along with chills.

Laboratory tests showed increased leucocytes count ($21,000/\text{mm}^3$); no other abnormalities were observed, including the serum urea and creatinine levels. The computed tomography identified the presence

of gas within the wall of the urinary bladder (fig. 1, white arrow). On notice, the patient did not present any urinary symptoms or signs, and he had a daily urinary output volume within the normal ranges. A urinary catheter was inserted, and broad-spectrum antibiotics and antifungal treatment were started. The evolution was rapidly progressive to septic shock, multiple organ dysfunctions, and death within 48 h after diagnosis. Hem cultures were positive for *Candida*.



Fig. 1. An axial computed tomography showing the aspects of emphysematous cystitis (presence of the gas within urinary bladder walls – white arrows).

DISCUSSION

A chyle leak is defined as a milky white fluid enriched in triglycerides ($>110\text{ mg/dL}$) (4), and it is considered a rare complication after pancreaticoduodenectomy, with a reported prevalence ranging from 1.8% to 16% (4-10).

The cause of a chyle leak after pancreaticoduodenectomy is a lymphatic disruption (4, 9). Manipulation of the para-aortic region (8), retroperitoneal invasion (8), the number of harvested lymph nodes (≥ 18) (6) or an extended lymph nodes dissection (5), vascular resection (6), portal vein/ superior mesenteric vein thrombosis (5), chronic

pancreatitis (10) and early postoperative feeding (7, 8) are considered independent risk factors for development of a chyle leak after pancreaticoduodenectomy. Furthermore, a chyle leak is also more frequently encountered after pancreaticoduodenectomy for a malignant pathology (8), in males (6), in patients with lymph nodes metastases (5;8), early T stages tumor ($\leq T2$) (7), advanced ages (≥ 66 years) (7), soft pancreas texture (7), and without postoperative pancreatic fistulae (7).

Although an early enteral nutrition was associated with high risk for chyle leak in some studies (7, 8), it is worth to mention

that the early enteral nutrition reduces the postoperative infectious complications after pancreaticoduodenectomies (11). Nevertheless, some studies did not identify an early enteral intake as a risk factor for a chyle leak development after pancreatectomies (9).

Postoperative enteral nutrition brings an intake of fats, and fatty meals increase the flow in the lymphatics (4). This is the reason a postoperative chyle leak can be clinically diagnosed after the enteral nutrition is restored. A drain output volume > 335 ml on postoperative day four after pancreatectomies was correlated with a high suspicion for a chyle leak diagnosis in some studies, particularly in the absence of a postoperative pancreatic fistula(7). A grading system for chyle leak after pancreatectomies was proposed in a study(10). The data from the literature have shown that the occurrence of a chyle leak after pancreatectomy is usually observed in the postoperative day 5- 8 (4-7).

In the reported case, male gender, advanced age, soft pancreas texture, a malignant early stage tumor (i.e., T1) and early enteral nutrition might be speculated as risk factors for postoperative chyle leak.

A persistent chyle leak may potentially induce malnutrition, immunodeficiency and sepsis because of the depletion for immunoglobulin, lymphocytes and long-chain triglycerides (6, 8); it is also associated with increased mortality (6). Peritonitis or other forms of sepsis were observed in about 20% of patients with pancreatectomies and a postoperative chyle leak or chylous ascites (6).

Total parenteral nutrition, octreotide (a somatostatin analogue) and medium-chain triglycerides are recommended for the treatment of a chyle leak, and most of the patients have a favorable outcome (5, 8).

An intraoperative milk test was suggested to identify a lymphatic leakage after pancreatectomies (4).

Emphysematous cystitis is a severe, life-threatening complication that occurs mainly in diabetic or immunodepressed patients (1). *Escherichia coli* represent the most frequent causative bacteria for emphysematous cystitis, while *Candida* remains an uncommon finding (1).

In the reported case, the infectious complication was most likely due to the persistent high output volume chyle leak, with substantial malnutrition and immunodeficiency, that couldn't be compensated by the parenteral nutrition.

The clinical symptoms of emphysematous cystitis are not particular, and the imaging investigations are the most important tool for diagnosis (12). Although a plain abdominal radiograph may diagnose the presence of the gas within the urinary bladder walls, computed tomography is considered the gold standard for the imaging diagnosis in patients with emphysematous cystitis, because it may exclude other causes of presence of the gas into the bladder, such as colo-vesical fistulae etc (12). Moreover, computed tomography may also detect the associated pyelonephritis (12).

In the reported case, there were no clinical or bioumoral signs to suggest a urinary disease. Furthermore, the diagnosis was established at computer tomography examination. An uncommon finding for the reported case of emphysematous cystitis was the *Candida* etiology.

The mortality rate in patients with emphysematous cystitis is 7% (1, 13), but may increase to over 50% in cases with associated pyelonephritis (1). Only an early diagnosis and an immediate aggressive treatment may save the patient from a fatal

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outcome (1, 13).

In the reported case, although the diagnosis of emphysematous cystitis appears to be made in the early setting, however, the evolution was rapidly progressive to a fatal outcome. This unfavorable evolution might

be explained by the *Candida* etiology in a severely immunodepressed patient.

In conclusion, emphysematous cystitis is an uncommon, but severe complication that may occur due to the postoperative immunodepression.

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