

CASE REPORT

Acute kidney injury due to abdominal compartment syndrome caused by duodenal metastases of prostate cancer

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Introduction

Abdominal compartment syndrome (ACS) is organ dysfunction due to increased intra abdominal tension. Main cause of ACS is intra abdominal hypertension (IAH) due to various factors such as abdominal surgery, ileus, intestinal obstruction, intraabdominal malignancy, and organomegaly. The most important clinical presentations of ACS are symptoms due to abdominal distension, acute oliguria, and respiratory problems [1]. We report a patient with external compression of distal duodenal segment due to the metastatic lymph nodes and acute kidney injury (AKI) as a result of ACS. It was diagnosed with computed tomography (CT) and after surgical intervention his clinical status improved significantly. We report this case because to date, a case of ACS due to metastatic prostate cancer has not been reported.

Case Report

A 78-year-old man admitted to emergency department with abdominal pain, distension, nausea, vomiting, and dyspnea for nearly 1 week and oliguria for 2 days. There was no history of nephrotoxic drug use or intravenous contrast exposure. Ultrasonographic and tomographic imagings did not reveal urinary tract obstruction. Bilateral renal parenchymal echo increased consistent with the acute kidney failure and the bladder was empty. Also there was no electrolyte disturbances that could contribute to kidney injury such as hypercalcemia, hypokalemia, hyperphosphatemia, or hyperuricemia. He had a history of prostate adenocarcinoma diagnosed 6 months ago but he did not accept the antineoplastic therapy performed for him. On physical examination, blood pressure was 115/80 mmHg, oral mucosa was wet and there was severe abdominal distension and tenderness. At admission laboratory values were as follows; urea: 116 mg/dL, creatinine: 4.7 mg/dL, C-reactive protein (CRP): 77 mg/dL, chloride: 90 mmol/L, lactate dehydrogenase (LDH): 556 μ /L, pH: 7.49, pCO₂: 35.9 mmHg, HCO₃: 28 mmol/L. On urinalysis; urine pH was <5 and density was 1017. On CT there were multiple lymph nodes in the abdominal cavity, also gastric and duodenal distension due to lymph node compression on distal duodenal segment (Fig. 1). Intravesical pressure of the patient was 36 mmHg (normal levels of intra-abdominal pressure: 0–5 mmHg). Endoscopy revealed gastric dilatation and duodeno-gastric reflux. After nasogastric (NG) tube insertion, 8 L of gastric fluid discharged suddenly. After medical decompression intervention, urine output increased gradually and creatinine levels started to regress.

Key Clinical Message

Organ dysfunctions caused by intraabdominal hypertension is named as abdominal compartment syndrome (ACS). A patient with prostate cancer admitted with dyspnea and oliguria. After decompression his health status improved. For patients with malignant disorders presented with oliguria and respiratory problems who have abdominal distension, ACS should be in mind.

Keywords

Abdominal compartment syndrome, acute kidney injury, intraabdominal hypertension, metastasis, prostate cancer.

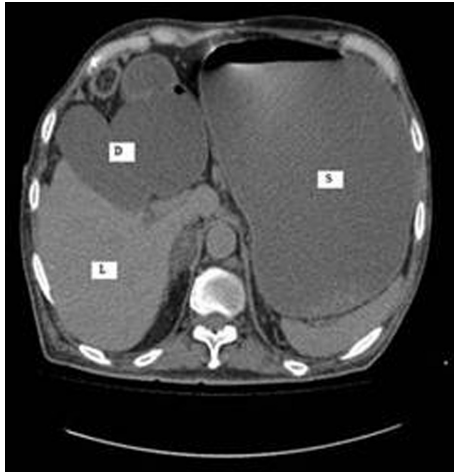


Figure 1. Abdominal CT image of the patient before decompression surgery. D, duodenal segments; L, liver; S, stomach.

But after the removal of NG tube, clinical status deteriorated again. Therefore, surgical decompression (gastrojejunostomy) was performed. After decompression operation beside the clinical and radiological status (Fig. 2), laboratory values improved, but intravesical pressure was not measured again. After operation laboratory values were as follows; creatinine: 2.4 mg/dL, CRP: 27 mg/dL, LDH: 399 μ L. During follow-up period creatinine levels fell to 2 mg/dL, gradually.

Discussion

IAH is defined as an IAP greater than 10 mmHg. Organ dysfunction due to IAH is called as ACS and it is a mortal condition especially for critically ill patients. ACS is not a disease, however, it can have many causes and can develop during many disease processes. ACS threatens the viability of surrounding intraabdominal organs. One of the most affected abdominal organs due to ACS is kidney and AKI is not rare in this condition. Serial measurements of IAP are recommended for diagnosis. Intravesicular pressure is a good estimate for IAP, is easily measured [1].

Our case had an uncontrolled prostate cancer history and presented with abdominal pain, dyspnea and oliguria. At admission we determined oliguric AKI and on CT gastric and duodenal distension due to metastatic lymph nodes were detected. After medical treatment and decompression operation clinical, radiological and laboratory parameters improved.

One of the most important factors that contribute organ failure caused by IAH is probably increased levels of proinflammatory cytokines. In a human model of IAH induced by laparoscopic surgery, markers of both systemic inflammation and AKI were increased. Thus, it is



Figure 2. Abdominal CT image of the patient after decompression surgery. L, liver; S, stomach; SI, small intestines.

not impossible to suggest that ACS caused by IAH is at least partly due to increased inflammation [2]. Also in our patient during the ACS period CRP level was high and decreased with successful treatment.

Intestinal obstruction is a predictor of IAH just as the fact that IAH is a predictor of mortality. In the majority of ileus and/or intestinal occlusion cases there is IAH and this is an early and important messenger of mortality in these conditions. Intra-abdominal pressure (IAP) higher than 20–25 mmHg may cause ACS and in this way acute functional loss of various abdominal and extra-abdominal organs. Inflammatory and hemodynamic factors caused by IAH may affect pelvic, thoracic, cranial and muscular areas beside abdominal organs [3, 4].

Several etiological factors may contribute to the development of ACS. Matthew et al. [5] reported a patient with ACS presented with AKI caused by air-trapping and excessive auto-positive end-expiratory pressure during intubation and recovered after extubation. After abdominal surgeries IAH is not rare and measurement of IAP is thought to be a predictor of AKI development for patients followed in intensive care units [6]. Mahajna et al. [7] reported a 72-year-old woman with ACS due to gastric dilatation after the surgery of retroperitoneal sarcoma and presented with cardiorespiratory collapse and anuria. After gastric decompression, all of her complaints regressed immediately [8]. Yanagisawa et al. reported a pediatric patient from Japan with ACS due to hepatomegaly and neuroblastoma and after decompression operation and continuous hemodiafiltration his health status ameliorated [9].

Optimal diagnosis of IAH is measurement of abdominal tension by intravesical method [1]. IAP may be detected by measuring the pressure of urinary bladder

(intravesical method) and it well correlates with IAP. Treatment options of World Society of the Abdominal Compartment Syndrome are: improvement of abdominal wall compliance, evacuation of intra-luminal contents, evacuation of intra-abdominal space occupying lesions, optimization of fluid management and optimization of systemic and regional perfusion [10, 11].

In the present case we detected AKI due to ACS in a patient with duodenal compression because of multiple metastatic intra-abdominal lymph nodes. During the follow-up period, especially for patients with malignant disorders with acute oliguria and respiratory problems who have abdominal distension, ACS should be in mind as causative factor. For patients with acute oliguria and respiratory problems who have abdominal distension, ACS and/or IAH should be in mind as differential diagnosis among other possible disorders.

Conflict of Interest

The author declares that there is no conflict of interests regarding the publication of this article.

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