

## Urinothorax: Always a Transudative Pleural Effusion?

**To the Editor:** Urinothorax is a rare cause of pleural effusion<sup>1</sup> caused by retroperitoneal urine leaking into the pleural space through diaphragmatic lymph nodes or an anatomical defect in the diaphragm. It is traditionally defined as pleural transudate, but can also be pleural exudate as in the patient we describe.

A 48-year-old man with no relevant history consulted for pain in the right abdomen and hematuria following an abdominal contusion. The physical examination showed pain with defense response on palpation of the right hypochondrium and flank, as well as right costovertebral angle tenderness. Macroscopic hematuria was present. Abdominal computed tomography (CT) revealed right renal laceration that extended toward the renal hilum (but no evidence of active bleeding), along with retroperitoneal and right-sided perirenal free fluid consistent with hematoma or urinoma. At 5 days post-trauma, the patient began to experience right pleuritic pain with diminished right basal sounds and signs of pleural effusion that was confirmed by radiography. Thoracentesis removed bloody pleural exudate with the following characteristics: pH, 7.47; glucose, 117 mg/dL; proteins, 41 g/L; low-density lipoprotein (LDH), 183 U/L; and hematocrit, 2.8%, that met Light's criteria for exudate based on the protein level (pleural-fluid-to-serum protein ratio of 0.65). Because urinothorax was suspected, pleural creatinine assessment was ordered; the creatinine level of 1.29 mg/dL gave a pleural-fluid-to-serum creatinine ratio above 1, confirming the presence of urine in the pleural space. Intravenous urography showed right pyelocaliceal dilatation and leakage of contrast material and, therefore, a double-J catheter was placed to drain the urinoma. An abdominal CT scan 15 days later showed resolution of the urinoma. The patient also reported a reduction of pleuritic pain during this period, and chest x-rays confirmed the disappearance of the pleural effusion.

Urinothorax was first described by Corriere et al<sup>2</sup> in 1968; only a few cases have been published in the literature since then. Leakage from the urinary tract can cause urinoma with retroperitoneal urine collection and secondarily, urinothorax, as urine passes from the renal injury to the ipsilateral pleural space. Nevertheless, the condition may occasionally be bilateral.<sup>3</sup> The most common causes of urinoma are obstructive uropathy, abdominal trauma with urinary tract involvement, retroperitoneal inflammatory or malignant processes, lithotripsy, failed nephrostomy, or renal biopsy.<sup>1,4,5</sup> The pleural fluid usually presents a color and odor similar to urine and the characteristics of a transudate, although with low pH and glucose, similar to the pH and glucose of urine. The diagnosis is



**Figure.** Note the detailed view of the right renal urinoma with ipsilateral pleural effusion.

confirmed by a pleural-fluid-to-serum creatinine ratio above 1 and there have been reports of urinothorax with elevated LDH concentrations.<sup>1</sup> Evidence of elevated pleural-fluid protein levels should not rule out urinothorax because the latter is sometimes associated with blunt abdominal trauma and bleeding in the urinary tract. The presence of urinoma with bloody urine can cause hemato urinothorax with elevated protein concentrations caused by plasma passing to the pleural fluid, which can elevate the pH value of the pleural fluid.

The diagnosis of urinothorax requires a high degree of suspicion and this entity is probably underdiagnosed in routine clinical practice because it is not taken into consideration in the differential diagnosis of pleural effusion.<sup>6</sup> Any patient with pleural effusion and a history of abdominal injury should be tested for pleural creatinine, even in the presence of bloody exudates, because this finding does not necessarily rule out urinothorax, classically described in the context of pleural transudates. Urinothorax usually resolves spontaneously with drainage of the urinoma.

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