Empyema secondary to obstructive pyelonephritis

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DESCRIPTION

A 76-year-old-man with a medical history of hypertension presented in the emergency department with a 3-month history of lumbar pain, associated with the appearance of a mass in the left lumbar region. He also described a 2-week history of progressive dyspnoea and productive cough. He had no history of fever or antibiotic prescription during this period. In the emergency room, he was afebrile and haemodynamically stable. Physical examination revealed diminished breath sounds, dullness over the lower region of the left hemithorax and a painful, erythematous and fluctuant 11×6 cm mass in the left lumbar region. Blood tests showed leucocytosis, thrombocytosis, normocytic normochromic anaemia and increased C reactive protein levels. There was a left-sided pleural effusion on the chest radiography, and the abdominal ultrasound exhibited a complex collection with possible fistula to the pleural space.

CT showed a large left multiloculate pleural effusion with pleural thickening consistent with an empyema, left obstructive hydronephrosis caused by calculus and atrophy of the left kidney associated with a large collection involving the left-sided perinephric psoas, subphrenic and perisplenic regions (figure 1 and video 1).

A diagnostic thoracentesis revealed purulent fluid with a white blood cell count of 233 593/L (60% polymorphonuclear cells), a pH of 6.8, a glucose concentration of 2 mg/dL and a lactate dehydrogenase level of 25 127 UI/L. Microbiological cultures of the pleural fluid and urine revealed

Video 1 CT coronal reconstruction showing left hydronephrosis caused by three calculi with a large abscess involving the psoas, subphrenic and perisplenic regions and in the left hemithorax with multiple collections with parietal enhancement compatible with multiloculated empyema and comprehensive atelectasis of the left lung.

Figure 1 CT sagittal reconstruction showing a large abscess involving the psoas, subphrenic and perisplenic regions, and an empyema in the left hemithorax.

the presence of *Escherichia coli* with identical resistance patterns (resistance to ampicillin and ciprofloxacin, and susceptibility to cefuroxime, trimethoprim/sulfamethoxazole and amoxicillin clavulanic acid; was identified using Vitek GNI automated system) with negative blood cultures. A broad-spectrum antibiotic was started, and pleural and percutaneous abdominal drains and a percutaneous nephrostomy were placed. Despite the initial improvement, the patient developed a nosocomial infection and died 2 weeks after due to septicemia.

This case demonstrates unusual and prolonged evolution of an obstructive hydronephrosis, culminating in multiple abdominal abscesses that fistulised to the pleural space, leading to empyema.

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Pleural empyema is generally the result of extension of infection from a contiguous source, commonly related to lung infections whose etiological organisms tend to be gram-positive aerobic species.¹ However, in a series of 122 empyemas, 15 cases developed as a result of intra-abdominal source, of which five were due to renal tract infection.² The microorganisms isolated from this empyema are those responsible for upper urinary tract infections, usually Gram-negative facultative anaerobes such as *E. coli* and *Proteus mirabilis*.^{2 3}

A patient with recurrent or unexplained suppurative thoracic infection where Gram-negative bacilli are isolated from the

pleural sampling should be investigated for renal or other abdominal sources.

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Learning points

- ▶ Extrathoracic causes of empyema are uncommon; however, the presence of gram-negative bacilli in the pleural space should prompt an investigation to rule out the intra-abdominal source.
- ▶ Initial treatment should include prompt drainage of pyogenic collections from the thorax and abdomen with concurrent initiation of appropriate antibiotics.

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