“Of horses and zebra”: gastro-intestinal pasteurella canis infection in acute myeloid leukemia patient

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“Of horses and zebra”: gastro-intestinal pasteurella canis infection in acute myeloid leukemia patient

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.
A 22-year-old female patient was diagnosed with acute myeloid leukemia (AML) with t(9;11) MLL3T-KMT2A in May 2016. After induction chemotherapy in the aplasia period the patient developed fever, malaise, psychiatric symptoms, followed by rapidly progressing pneumonia and acute respiratory failure (Figure 1A). Due to respiratory support need she was transferred to intensive care unit. Response to broad spectrum antibiotics was achieved and the patient’s condition improved in parallel to hematological recovery. Bone marrow biopsy results confirmed complete remission (CR). One week after intrathecal chemotherapy administration the patient developed epileptic state. In brain computed tomography (CT) and magnetic resonance imaging (MRI) a tumor in the right occipital lobe was found with gradual progression (Figure 1B,1C). Stereotactic biopsy was non-diagnostic and neurosurgical tumor excision was carried out. Histopathology revealed brain abscess with significant necrosis inside. Unfortunately, microbiological assessment was not performed. In September 2016, during neutropenia after consolidation chemotherapy, pneumonia classified as probable pulmonary aspergillosis was diagnosed, based on lung high resolution computed tomography (HRCT) and positive serum galactomannan test result. Broad spectrum antimicrobial therapy was instituted. However, the patient’s status improved after hematological recovery. Persistence of non-characteristic digestive symptoms led to further diagnostics. Based on abnormalities in consecutive abdomen CT imaging (Figure 1D,1E), liver biopsy was undertaken. It revealed low grade liver inflammation, classified as G2, F1/2 (Figure 1F,1G,1H). Surprisal, penicillin-susceptible, ciprofloxacin- and cefotaxime-resistant, Pasteurella canis was cultured from liver tissue sample. Six months of oral phenoxymerphenicillin therapy was used and in July 2017 the patient was subjected to allogeneic hematopoietic stem cell transplantation (alloHSCT) with myeloablative conditioning. In neutropenia, she developed fever and asymmetric erythematous swelling of left forearm, localized in the scar of a dog bite several years ago. At the same time pulmonary
infiltrates were found in lung HRCT. After broad spectrum antimicrobial therapy and hematological recovery, prompt regression of symptoms was observed. Further post-transplant clinical course was uneventful.

Pasteurella is a genus of Gram-negative bacteria, small, nonmotile, facultatively anerobic [1,2]. In cats and dogs, it constitutes part of the normal flora of the nose and mouth. Majority of human infections are caused by dog and cat bites [1,3]. Based on literature review, this is a first case report of P. canis gastro-intestinal infection in AML patient. There are several reports of peritonitis caused by more common pathogen – P. multocida, in diabetic, dialyzed or chronic liver disease patients [1,2,3].

AML patients, especially in neutropenia, represent population highly predisposed to developing any infection. However, gut colonizing Enterobacteriaceae and fungi, both yeasts and molds, cause majority of infections. Empirical antimicrobial strategies are constructed to cover these pathogens [4,5]. Reviewing blood culture results, the patient experienced Klebsiella pneumoniae ESBL-positive bacteremia and two episodes of Candida glabrata fungemia. Pulmonary aspergillosis, as previously mentioned, was suspected. However, unusual course with severe infection episodes complicating every neutropenia period – pneumonia, brain abscess and gastro-enteritis – caused the need of further diagnostics. Imaging techniques followed by liver biopsy with microbiologic assessment allowed to diagnose unique gastro-intestinal pastuereulosis. The etiology of brain abscess remains unknown.
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Figure 1A: lung high resolution computed tomography: fluid in pleural cavities, pulmonary inflammatory alveolar and interstitial infiltrations.
Figure 1B: brain magnetic resonance FLAIR T2 sequence: on the border of the right occipital and parietal lobes an oval tumorous lesion with heterogeneously hyperintense signal on magnetic resonance FLAIR images.
Figure 1C: brain magnetic resonance FLAIR T2 sequence: In the right occipital and parietal lobes diffuse white matter hypointensity representing edema, surrounding an oval tumorous lesion.
Figure 1D: abdominal computed tomography: numerous lymph nodes in the mesentery root, larger than previously
Figure 1E: abdominal computed tomography: thickened wall of jejunum, with strong intravenous contrast media enhancement, particularly in mucosa
Figure 1F: liver histopathology (hematoxylin/eosin staining): portal space slightly widened with moderately abundant inflammatory infiltrate.
Figure 1G: liver histopathology (hematoxylin/eosin staining): lobular inflammatory infiltrate
Figure 1H: liver histopathology (immunocytochemistry): CD8-positive T cells in portal space inflammatory infiltrate