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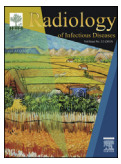

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CT findings of severe dengue fever in the chest and abdomen

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Abstract

Objective: To study and analyze the chest CT and abdominal CT findings of severe dengue fever.
Methods: Imaging data of chest CT and abdominal CT in 38 patients with severe dengue fever were retrospectively analyzed.
Results: For chest CT of these patients, 34 cases were positive, with the main performances were pleural effusion (n = 21), patchy clouding opacity (n = 20), atelectasis (n = 18), nodule (n = 6), and pericardial effusion (n = 3). For abdominal CT, 12 cases were positive, including hematoma (n = 4), ascites (n = 4), multiple low density space-occupying lesions in hepar (n = 3), and nephropathy (n = 3).
Conclusion: The main CT features of severe dengue fever in chest and abdomen were pleural effusion, patchy exudation and multiple abdominal lesions. These CT findings facilitate more accurate diagnosis of dengue fever.

Keywords: Dengue fever; Dengue virus; X-ray computed tomography

1. Introduction

Dengue fever (DF) is a set of acute vector-borne infectious diseases caused by mosquito infected with dengue virus (dengue virus, DV), which is widely prevalent in tropical and subtropical regions. DV has four serotypes (DV1-4), namely DVI, II, III, and IV [1]. Once infected with DV, body can be presented in two different states, namely primary infection and secondary infection status [4], and dengue fever, dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS) may occur [2,3]. Dengue fever is a self-limiting disease, with the main symptoms of fever, muscle pain, headache and rash. By now, there are no sufficient reports on imaging manifestations of dengue fever, especially for severe type. Aimed at further understanding of the disease, severe dengue patients in our hospital with CT image data (34 cases of chest CT and 21 cases of abdominal CT) were collected and analyzed.

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2. Materials and methods

2.1. General information

38 patients with severe dengue from June to October 2014 in our hospital were collected for CT scans (34 for chest CT, and 21 for abdominal CT). The main symptoms are as follows: 38 patients with fever, 14 cases with muscle pain, 9 cases with headache, 12 cases with dizziness and fatigue, 21 cases with anorexia, 6 cases with rash, 3 cases with vaginal bleeding, 4 cases with hematoma, 7 cases with consciousness disorder, and 8 cases with vomiting and black.

2.2. Laboratory tests

PCR for dengue virus nucleic acid testing showed positive in 38 cases, including 33 cases of DV I and 5 cases of DV II. It was showed dengue antibody IgM/IgG test positive in 36 patients, white blood cell count decreased in 21 cases with a minimum of 1.32 × 109/L, low platelet count in 38 cases with a minimum of 5.0 × 109/L.

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Case selection criteria [5]:

a Clinically diagnosed cases: fever, headache, muscle pain, joint and bone pain, rash, bleeding tendencies, living in the affected areas, and there are white blood cells and/or thrombocytopenia, a single serum DENV-specific IgM antibodies.
b Confirmed cases: detecting DENV nucleic acid, DENV NS1 antigen from the serum of acute patients or isolating virus.
c Severe dengue diagnostic criteria: any one of severe bleeding (including subcutaneous hematoma, haematemesis, bloody diarrhea, vaginal bleeding, hematuria, intracranial hemorrhage, etc), shock or organ dysfunction (alanine aminotransferase (ALT) and/or aspartate aminotransferase (AST) > 1000 IU/L, ARDS, acute myocarditis, acute renal failure, encephalitis, meningoencephalitis).

2.3. Imaging method

Regular helical scan and HRCT scan were performed by employing the Philips Mx 8000 MSCT, with screw Rotary slice thickness of 6.5 mm and interlayer spacing of 6.5 mm. Continuous partial HRCT scan was performed with thickness of 1 mm and interlayer spacing of 1 mm. Patients were supine, with arms raised, with head advanced, performing inspiratory breath-hold volume scanning. CT images were analyzed by two professional radiology physicians.

3. Results

Regular chest CT examination was performed for 34 cases, and all were positive performances, with pleural effusion in 21 cases (61.76%, 21/34), patchy exudation in 20 cases (58.82%, 20/34) (Figs. 1 and 2), atelectasis in 18 cases (52.94%, 18/34), small nodules in 6 cases (17.65%, 6/34), and pericardial effusion in 3 cases (8.82%, 3/34).

Abdominal CT examination (in the upper abdomen CT scan examination-based) were performed for 21 cases, and abnormalities were found in 12 cases, including hematoma (underlying rectus abdominis, subcutaneous and perinephric) in 4 cases (19.05%, 4/21) (eg Figs. 3–5), ascites in 4 cases (19.05%, 4/21) (5, 6), intrahepatic multiple low density lesions

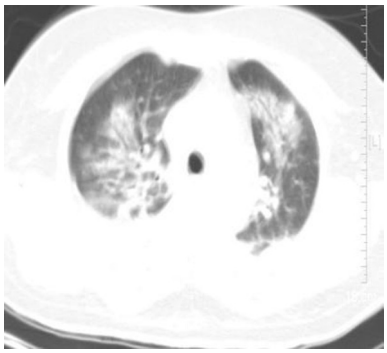

Fig. 1. Patchy exudation.

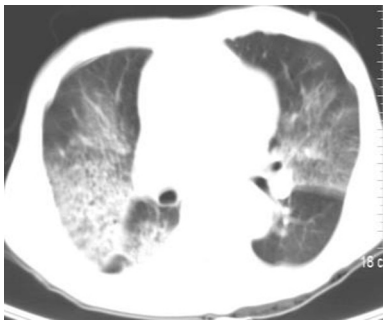

Fig. 2. Patchy exudation.

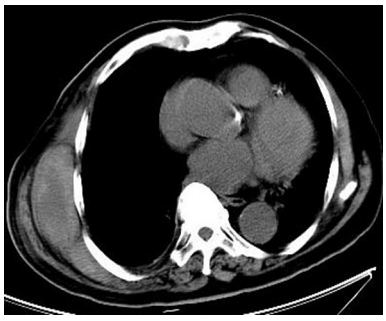

Fig. 3. Hematoma underlying rectus abdominis, subcutaneous hematoma and perinephric hematoma.

Fig. 4. Hematoma underlying rectus abdominis, subcutaneous hematoma and perinephric hematoma.

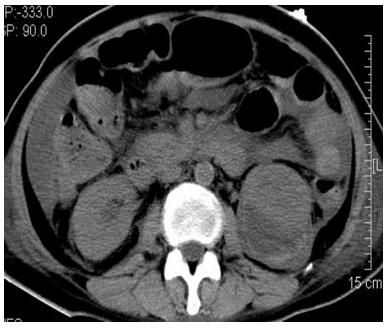

Fig. 5. Hematoma underlying rectus abdominis, subcutaneous hematoma, perinephric hematoma and ascites.