

Possible fluids

Case 354

4. All

【Progress】

She was served as inpatient under medication and nursing against advanced gastric cancer with invasion to transverse colon.

【Discussion】

CT images are created by the degree of X ray absorption using monotone color from black to white. Sixteen greys from black to white are used to make images according to X ray absorption. Various substances with different X ray absorption exist in nature. For CT, Hance Field units of -1000 indicate air, and those of $+1000$ do thickened calcification (1, 2). CT images are created by white-black coloring based on Hance Field units. For example, CT images with level 40 and width 40 are created as follows; substances with 0 or less are all colored black, while those with 80 or greater are all colored white: substances between 0 to 80 are colored grey according to their CT Hance Field units.

One physician asked me about the high attenuation fluid in cecum on abdomen CT with level 20 and width 300. My answer was that water soluble contrast medium is excreted not from kidney but biliary tract depending on renal function; then, contrast medium possibly injected into vein several hours or a few days before: there is also contrast medium aimed to excrete biliary tract in drip infusion cholangiography. However, the patient had never experienced to receive any contrast medium.

High attenuation fluids of over 30HU on CT are blood, abscess and mucin (1, 2). CT values of blood are dependent on volume of red blood cells containing hemoglobin of Fe: CT values of aortic lumen or cardiac lumen are 25-40, those of dense blood can elevate to 75-100. CT values of abscess possibly reach 40 HU (3-6). CT values of mucin can reach 0 to 130 CTHU (4-6). Mucin composed of repeated molecules arrangements and categorized into 22 kinds depending on the number of the repetition increases. CT vales elevate as the number of the repetition increases.

Mucin is protein conjugated with glycogen, being secreted from epithelium and forming gel which prevent from invasion of pathogen. It plays roles as lubricant between cell spaces and the first immune barrier (2).

In our case, high attenuation fluids in cecum and ascending colon are thought to be probably mucin. Mucin secreted from distal ileum is reported to repress proliferation of streptococci which often cause infectious ileitis.

【Summary】

We presented a seventy-year-old female whose cecum contains high attenuation fluids on abdomen CT whose CT vales are around 60 HU. It is borne in mind that mucin is subclassified into 22 kinds, inducing various CT vales of 0 – 130. Mucin in cecum plays a role of repressing streptococcus proliferation which cause infectious ileitis.

【References】

1. Hounsfield Scale for different kinds of tissues (adapted from Institut für Anatomie, Universität Bern) de Alcântara et al
2. Wikipedia https://en.wikipedia.org/wiki/Hounsfield_scale Hounsfield scale - Wikipedia
3. Gaeta, et al. "CT and MRI findings of mucin-containing tumors and pseudotumors of the thorax: pictorial review". *European Radiology*. 2001; 12 (1): 181–189.
4. Phuyal Subash et al. (2015-09-02). "High-Attenuation Mucus Impaction in Patients With Allergic Bronchopulmonary Aspergillosis: Objective Criteria on High-Resolution Computed Tomography and Correlation With Serologic Parameters". *Current Problems in Diagnostic Radiology*.
5. Agarwal, Ritesh et al. "Radiologic Criteria for the Diagnosis of High-Attenuation Mucus in Allergic Bronchopulmonary Aspergillosis". *Chest*. 2016; 149 (4): 1109–1110.
6. Frenkel ES, et al. "Salivary mucins protect surfaces from colonization by cariogenic bacteria". *Applied and Environmental Microbiology*. 2015; 81 (1): 332–38.
7. ^Kavanaugh NL, et al. "Mucins suppress virulence traits of *Candida albicans*". *mBio*. 2014; 5 (6): e01911.
8. Frenkel ES, et al. "Salivary mucins in host defense and disease prevention". *Journal of Oral Microbiology*. 2015; 7 (1): 29759.