



上海市第六人民医院
上海交通大学附属第六人民医院

Diagnostic value of CT window technique for primary omentum farction

Yue Du[#], Yan Chen[#], Cai-hong Li, Bi Zhou,
Jin-liang Wu, Liang-rui Gu, Kai Yang*

Shanghai Sixth People's Hospital

Affiliated to Shanghai Jiao Tong University





Introduction

Clinical omental infarction were divided into primary and secondary according to the etiology:

- ◆ secondary omental infarction is more common, the main causes including:
abdominal trauma, retinal torsion, adhesions and other abdominal organ lesions;
- ◆ primary omental infarction is an acute vascular injury of the greater omentum, which is rare and the cause is not clear.

Abdominal CT window width technology mainly diagnoses parenchymal organs and intestines.

Omentum is fat density, it is black in the conventional abdominal window width technique, which often leads to missed diagnosis of omental lesions.





Introduction

Searching the literature on epiploic appendagitis, the authors suggest that the general abdominal window width is unclear for some cases, and even individual cases are not displayed.

On the basis of appropriate adjustment of the window width, the cases that are missed can be clearly observed.

CT window width technique was not found in the CT diagnosis of primary omental infarction by literature.

This article explores the diagnostic value of CT window width technique for primary omental infarction, improves CT detection rate and diagnosis rate, and avoids missed diagnosis.





Objective

This article explores the diagnostic value of CT window width technique for primary omental infarction, improves CT detection rate and diagnosis rate, and avoids missed diagnosis.





Methods

The abdominal CT data of 32 patients with clinically diagnosed abdominal omentum infarction were retrospectively selected and analyzed.

Scanning using Aquilion/TSX-101A spiral CT machine, parameters: 120KV/154mA, layer thickness according to need to use 5.0/1.0mm, pitch is 1.

Because they are acute abdomen treatment, so only 1 case perform an enhanced CT examination

The fixed window position was 50 HU, and the window width was 135 HU, 250 HU (abdomen), 350 HU (mediastinum) and 500 HU respectively.

The detection rate of lesions was analyzed and compared.





Results

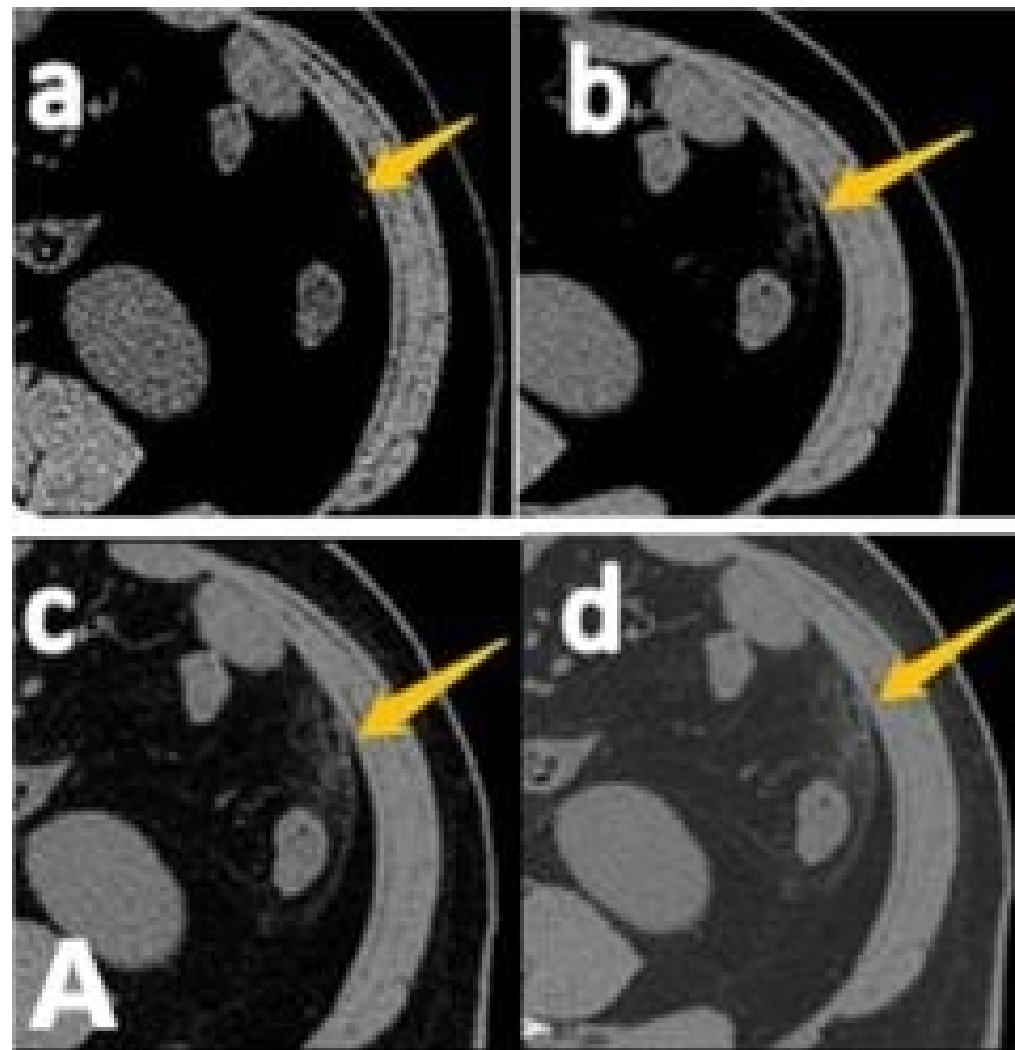
Table Diagnostic rate of different CT window widths for primary omentum infarction

window width	135HU	250HU	350HU	500HU
Deputy Chief Physician A	18.75% (6/32)	62.5% (20/32)	100% (32)	100%(32)
Deputy Chief Physician B	6.25% (2/32)	50% (16/32)	100%(32)	100%(32)
Deputy Chief Physician C	12.5% (4/32)	75% (24/32)	100% (32)	100% (32)
Comprehensive result	12.5%±5.1%	62.5%±10.21%	100%±0%	100%±0%

The different letters 135HU, 250HU and 350HU indicate a significant difference of $P < 0.05$.



Results



Female, 30ys

primary omental infarction: 1 day of pain in the left lower quadrant of the patient

a-d: the window width 135HU, 250HU, 350HU, 500HU, respectively.

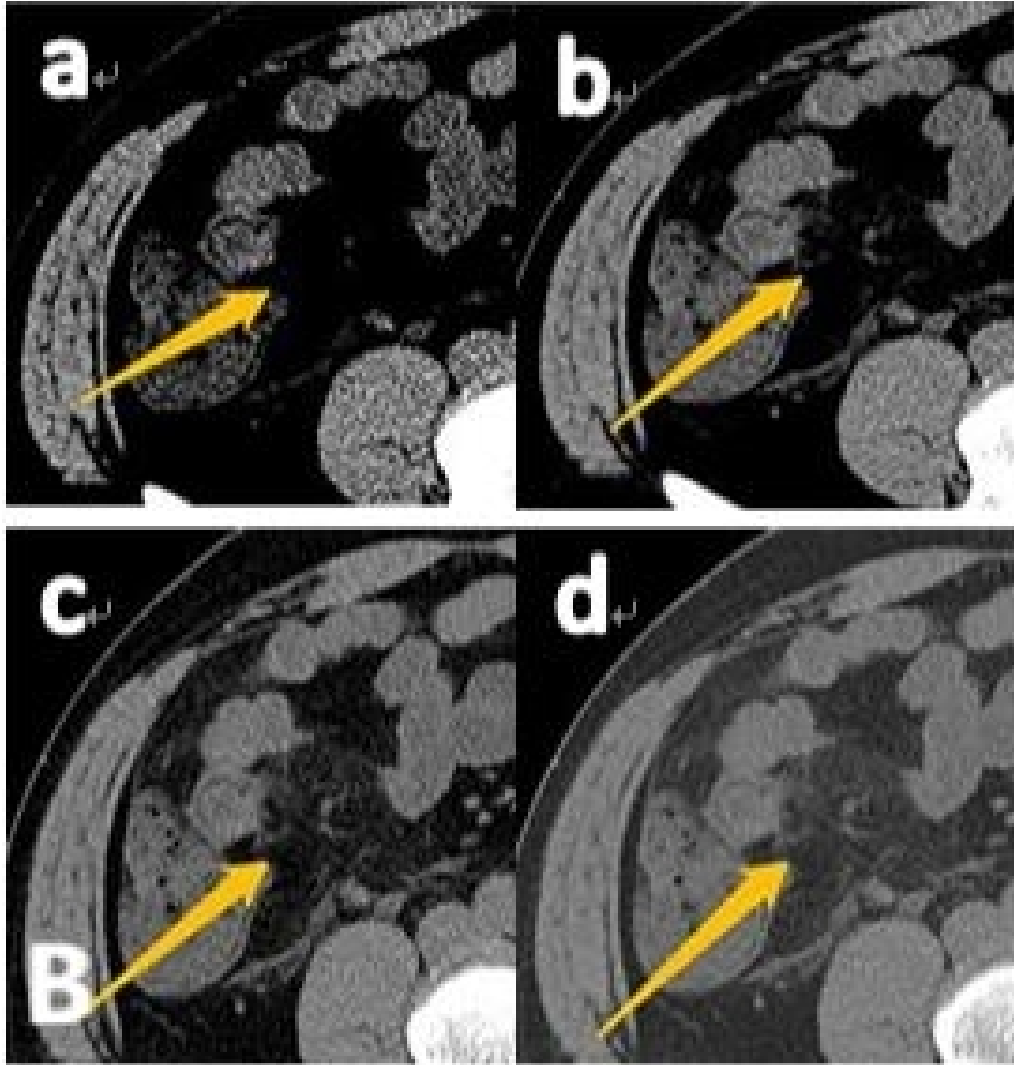
a: There is no obvious abnormal performance.

b: a little blurry shadow around the descending colon.

c and d: the small piece of high density shadow near the descending colon, and the surrounding fat gap is cloudy.



Results



Male, 54 ys

primary omental infarction: 2 days of right
lower quadrant pain

a-d: the window widths 135HU, 250HU,
350HU, 500HU, respectively;

no obvious abnormalities in a and b

c and d image can clearly show a large flake
blur shadow around the ascending colon,
accompanied by turbidity around the fat gap.





Results

The displaying rates of images is low with 135 and 250HU window width, and some are not even displayed.

On the 350 and 500HU window width, all of 32 cases can clearly display the lesions.

Significant differences between 135HU, 250HU, and 350HU (500HU) indicate that there is a significant difference in the diagnostic rate of primary omental infarction between different window width techniques ($P < 0.05$), and there is no significant difference between 350HU and 500HU.





Discussion

Etiology and predilection site

Primary omental infarction mostly occurred in the right part of the greater omentum, accounting for about 90% of all cases. The right half of the greater omental fat deposition is more than the left side, and the right part is also longer, more active, prone to twist; large omentum right vascular variability also made venous thrombosis more likely.

There are relatively few organs on the left abdomen, when the patient has symptoms such as abdominal pain, in order to further investigate the etiology, a CT scan will be taken first; Therefore, the greater omental infarction on the left side more than on the right side.





Discussion

Pathophysiology

The infarcted omentum is shaped like a "pie-like", often accompanied by exudative changes. When the spread is wide, it can be extended to adjacent tissues and parietal peritoneum, and adhesion occurs, but generally does not cause thickening of the intestinal wall [6]. During the operation, the infarct area can be found to form a hard, red or purple-black mass with a hard texture.





Discussion

Diagnosis

Primary omental infarction is a diagnosis of exclusion, which can be diagnosed according to the following:

- ① The duration of abdominal pain is short, mostly 1-3 days, but the signs of local peritonitis are obvious, and the general condition is good, except for trauma, recent surgical history, other organ diseases in the abdominal cavity, etc.
- ② CT manifested as a pie-like or flaky high-density shadow and blurred shadow around the intestine.
- ③ Diagnostic abdominal puncture can draw bloody liquid, amylase normal or elevated is not obvious.
- ④ Laparoscopy or surgery can be seen in the local large omentum becomes black and manifested as irregular pie-shaped necrotic tissue.





Discussion

CT window technique

The CT window technique includes window width and window level. Increasing the window width increases the range of tissue density that can be observed, but the image contrast is reduced; while the window width reduction results in the opposite result, and the low-density portion of the tissue is not displayed .

The observation range of the conventional abdominal window width (135HU) is small, when the tissue around the organ such as omentum and mesentery is not ideal displayed. When the window width is appropriately increased to 350HU and 500HU, the changes of omentum tissue can be clearly displayed.





Discussion

CT window technique

In our group, the lesion display effect is poor and easy to miss diagnosis with 135HU and 250HU window width, and there is no case of missed diagnosis with 350HU and 500HU the window width. The window width of 350HU showed clear changes in the parenchymal organs, the intestines and the wall of the colon wall, and the window width of 500HU showed poor performance.

Therefore, the use of window width 350HU as the ideal window width for the diagnosis of primary omental infarction and reduce misdiagnosis and missed diagnosis .





Conclusion

Appropriate window width technology for retinal tissue can obtain the best image performance, significantly reduce the rate of missed diagnosis of primary omentum infarction, and provide assistance for clinical diagnosis and selection of reasonable treatment options to avoid delays the disease and unnecessary surgery.

According to the comprehensive image quality, 350HU (mediastinum) window width is the ideal window width for the diagnosis of primary omentum infarction.





上海市第六人民医院
上海交通大学附属第六人民医院

Thanks your attention

