Is it really honeycombing? Limitations and pitfalls in radiological diagnosis of honeycombing.

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• All authors have no relevant financial disclosures
The honeycombing quiz.

Half of the images in this slide correspond to honeycombing and the other half are entities mimicking it. In this education exhibit clues for a correct diagnosis and limitations in the radiological definition of honeycombing will be reviewed.
Introduction

- Diagnosis of radiological honeycombing is crucial for establishing an usual interstitial pneumonia pattern, for that reason a confident diagnosis is desirable.
- However, several studies (1,2) have shown a relatively low interobserver agreement in the diagnosis of honeycombing, at different levels of radiologists experience.
- There is a typical appearance (figures) of clustered peripheral thick wall air cysts that cause few problems for the vast majority of readers, but the daily radiological spectrum can be more complicated.
- We have focused this presentation on potential pitfalls that radiologist have to keep in mind for avoiding misdiagnosis of honeycombing, and have divided in four groups: small cysts, big cysts, bronchiectasis and centrilobular emphysema under other pulmonary conditions, mainly infection.
Small cysts

- Radiologists must be aware that a microscopic honeycombing under CT scans resolution frequently exists. Very small cysts in regions with other signs of fibrosis can correspond to this microscopic honeycombing.
- Sometimes there is a gap between what pathologist and radiologists call honeycombing. Other signs such as traction bronchiectasis and bronchiolectasis are the clue to suggest the diagnosis.

CT and pathologic correlation in a 43 year-old man with a pathologic UIP pattern showing small sized honeycombing (yellow arrowheads) at HRCT.
Which of these should you certainly call honeycombing?
Which of these should you certainly call honeycombing?

As you can see, A–B and C-D correspond to the same patients, respectively. Probably you can have reasonable doubts in A and D due to the small cysts, but feel more comfortable making the diagnosis of honeycombing in B and C.
Big cysts

- Honeycombing in areas with emphysema and fibrosis can be difficult to differentiate from each other.

64-year-old smoker with rheumatoid arthritis, pulmonary fibrosis with UIP pattern and left pleural effusion. Cystic lesions in right lower lung suggest honeycombing with big cysts in this setting.
Big cysts

- Relatively big honeycombing cysts (1-2 cm) are frequent in combined pulmonary fibrosis and emphysema syndrome (3). Thick-wall cystic lesions as shown in the image below are also frequently found in those patients.
Bronchiectasis

- Sometimes, appearance and distribution of ectatic bronchi can mimic honeycombing. This is not surprising, since part of the honeycombing cysts correspond histologically to bronchiolectasis (4).
- Review of contiguous slices and multiplanar reformatting can be useful. When a bronchiectasis ends and a honeycombing cyst begins can be difficult to ascertain such as in the figure.
- There is an increasing trend to consider traction bronchiectasis and honeycombing as part of the same spectrum of remodeling of the lung due to fibrosis (5, 6).
Pulmonary fibrosis in a patient with scleroderma. Multiple variable sized cysts are seen. Also note dilated esophagus. In this individual image, diagnosis can be difficult. Next slide can help.
Pulmonary fibrosis in a patient with scleroderma. Reformatted coronal CT show how at least part of cystic lesions in previous slide correspond to bronchiectasis (red arrows). Right middle lobe clearly depicts the bronchiectasis centrally.
Centrilobular emphysema under other pulmonary conditions

- Infection, inflammatory conditions and edema in patients with centrilobular emphysema can closely resemble the appearance of honeycombing. Distribution and visualization of centrilobular arteries are the clue to avoid a false diagnosis. A follow-up CT scan should solve the doubt.
Centrilobular emphysema under other pulmonary conditions

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Centrilobular emphysema under other pulmonary conditions

Same patient 1-month follow-up
These figures resemble each other, but can you see the differences?
**Emphysema**
Clue: You can see the centrilobular arteries and cyst are not subpleural in some cases.

**Honeycombing**
Clue: Traction bronchiectasis are seen next to the cysts.
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The honeycombing quiz.
These images ARE NOT honeycombing. Bronchiectasis (above) and emphysema (bottom line) are the causes of cystic peripheral lesions.
The honeycombing quiz.
These images ARE honeycombing.
References

1. Watadani et al. Radiology 2013; 266: 936
2. Walsh et al. Thorax 2016; 75: 41
6. Gruden et al. AJR 2016; 206: 495
Other suggested readings

1. Arakawa & Honma. AJR 2011; 196: 773
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