CT偶发肺结节的应对措施

安徽医科大学第一附属医院
吴兴旺
女性，50岁，无特殊不适

2019.6.20  2019.7.20  2019.1.22

结果：炎症
男性，49岁。正常体检

2016.9.7               2017.8.3               2019.4.9

手术结果：浸润型腺癌
女性，45岁。正常体检

2017.6.8

2018.6.10

手术结果：微浸润型腺癌
概念

- 结节：单个病变最大径＜3cm；多发病变最大径之和＜3cm。

- 肿块：最大径＞3cm。
肺结节的种类（组织病理学）

- 不典型腺瘤样增生（AAH）；
- 原位癌（AIS）；
- 微浸润型腺癌（MIS）；
- 浸润型腺癌（IS）。
不典型腺瘤样增生（AAH）
原位癌（AIS）
微浸润腺癌（MIS）
浸润型腺癌（IS）
肺结节分类（CT密度）

- 纯磨玻璃结节；
- 混合密度结节；
- 实性结节。
纯磨玻璃结节
混合密度结节

AIS

MIA

IA
实质性结节
肺结节的危险度评估

- 低恶性概率结节
  - 小于35岁。
  - 不具备其他高危因素

- 高恶性结节概率
  - 大于35岁。
  - 吸烟。
  - 有家族史接触过石棉等高危因素。
  - CT表现形态学可疑
肺结节倍增时间

- AAH: $988 \pm 470$ d
- AIS: $567 \pm 168$ d
- IA: $384 \pm 212$ d
- peripheral squamous cell carcinomas: $122 \pm 68$ d
提示恶性的形态学征象

- 结节分叶状。
- 毛糙边缘，早期病灶毛刺率低。
- 混杂密度结节，有强化。
- 动态随访，结节增大或GGO变密实。
- 结节内部有空泡和细支气管征。
提示良性的形态学特征

- 体积小，形态规则。
- 边缘光滑。
- 密度均匀，没有或轻度强化。
- 病灶内有钙化，尤其是爆米花样钙化。
- 动态观察病灶缩小或两年内稳定。
63岁男性患者，2016.8.30

2017.12.20
### 如何对待肺结节

#### Fleischner Society 2017 Guidelines for Management of Incidentally Detected Pulmonary Nodules in Adults

#### A: Solid Nodules

<table>
<thead>
<tr>
<th>Nodule Type</th>
<th>Size</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;6 mm (&lt;100 mm³)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>No routine follow-up</td>
<td>CT at 6–12 months, then consider CT at 18–24 months</td>
</tr>
<tr>
<td>High risk</td>
<td>Optional CT at 12 months</td>
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<td></td>
</tr>
<tr>
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<td></td>
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### Notes

- Low risk: 6 mm or less in diameter, no磨砂，no history of smoking, and no underlying disease that would cause a mass. (recommendation 2A)
- High risk: 6 mm or less in diameter, history of smoking, or underlying disease that would cause a mass. (recommendation 1A)

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### Additional Guidelines

- **Active surveillance**: Continuous follow-up with CT scans at regular intervals (recommendation 2B).
- **Biopsy**: If the nodule is high risk, biopsy may be considered to confirm the nature of the nodule. (recommendation 1A)
- **Observation**: In low-risk patients, observation without further CT may be appropriate. (recommendation 2B)
### 如何对待肺结节

<table>
<thead>
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<th>B: Subsolid Nodules</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Nodule Type</strong></td>
<td><strong>&lt;6 mm (&lt;100 mm³)</strong></td>
<td><strong>≥6 mm (&gt;100 mm³)</strong></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground glass</td>
<td>No routine follow-up</td>
<td>CT at 6–12 months to confirm persistence, then CT every 2 years until 5 years</td>
</tr>
<tr>
<td>Part solid</td>
<td>No routine follow-up</td>
<td>CT at 3–6 months to confirm persistence. If unchanged and solid component remains &lt;6 mm, annual CT should be performed for 5 years.</td>
</tr>
<tr>
<td>Multiple</td>
<td>CT at 3–6 months. If stable, consider CT at 2 and 4 years.</td>
<td>CT at 3–6 months. Subsequent management based on the most suspicious nodule(s).</td>
</tr>
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</table>
无须紧张的结节

- 直径＜6mm的结节；
- 有钙化的结节；
- 实性、边缘光滑清晰的结节。
错构瘤
需要警惕的结节

- 磨玻璃结节；
- 有实质性成分的结节；
- 边缘毛糙、不规则的结节。
随访方法的选择

PE/PET-CT？

穿刺活检？

都要手术？

有其他办法？
PET/CT

- 8–10 mm in size: sensitivity, specificity, and accuracy of 96%, 88%, and 94%, respectively;
- False-negative rate for ≤10 mm or slow-growing

**Do not infatuation PET or PET\CT**

AAH: 100%
AIS: 80%
MIA: 47%

- Higher truepositive rate for IA.
AIS. 7mm，18个月后15mm，PET/CT阴性
PET/CT 价值

- 分期
- 评价预后

Low FDG uptake: good prognosis

High FDG uptake: with poorer survival
活检

诊断获益：

主要针对实质性或实质性成分为主的结节，对纯磨玻璃结节价值有限。
都需要手术吗？
What can we do?

- Low-dose CT follow-up复查：
  - Low-dose (80mAs);
  - Thin sections (1.25mm);
  - High resolution CT surveillance;
- At least follow-up in 3 months for 3 to 5 years.
怎么关注：动态观察结节演变的特征

- 大小
- 形态
- 密度（成分的改变）
- 稳定性
纯磨玻璃结节的随访变化

- 随访无变化
- 体积增大，密度未增加
- 体积未增大，密度增加
- 体积增大，密度增加
有实质性成分的结节

随访未变化

GGO成分增大，实质性成分未变化

GGO成分未变化，实质性成分增多

GGO成分及实质性成分均增多
Pure GGNs < 5mm in Size

- <5mm的孤立性病变: Foci of AAH
- <5mm的多发病变：有吸烟史的患者

At least a 1-year follow-up
GGN in a 65-year-old man. A, CT scan (1.25-mm-thick section) shows a pure GGN in the left upper lobe.

B, Follow-up CT in 3 months shows resolution of the nodule, consistent with an infectious process or aspiration.
(a) Magnified 1-mm CT section through the right upper lobe shows nodules with. (b) Follow-up CT scan obtained 3 months later shows near complete resolution of the lesion (arrow), focal nonspecific inflammation.
Solitary Pure GGNs ≥5mm in Size

- At least follow-up in 3 months for 3 to 5 years
  - 体积增大
  - 密度升高
  - 有实性成分出现
  - 病灶中心活检或手术切除
右上肺磨玻璃结节，随访1年后，大小未变，中心出现实质性成分。
• CT sections show minimal increase in size of a nodule with GGO over a 3-year period.
The left upper lobe GGOs initially measuring 8mm in size over a 3-year period.

The nodule with were remained stable
A–F, Yearly axial CT follow-up images from 2005 to 2010 show slow increase in size and density of an initially subtle ground-glass opacity in the left lower lobe.
SSNs

- 低剂量、薄层、高分辨率CT随访
  
  密切关注病变阶段性变化
  
  对实性成分准确地测量
Solitary Part-solid GGN

- 无论大小如何：侵袭性病变
  
  Must 3-month follow-up

- 实性成分 >10 mm
  
  PET or preferably PET/CT
  
  结节生物学行为、术前分期、预后评价
• Increase in size and subsequent development of a solid component. Histologic analysis shows IA
a, left lower lobe shows a SSNs.
b, Follow-up 6 months later shows increase in the extent of the solid.

IA
Multiple SSNs

- 3个月随访一次
- 持续性,大小和密度增加的患者，尤其是实性成分 >10mm
  PET/CT should be considered

手术切除：一个或几个大的结节
a, CT section shows multiple small lesions with GGO and one dominant larger nodule with GGO (arrow). b, CT scan at 4-year follow-up shows no substantial interval change (arrow) and the lesions were presumed to represent AAH and AIS (dominant lesion).
After resection of a malignant SSNs

实质性也好，多发也罢

每年1次低剂量CT

至少3～5年
**Subsolid Pulmonary Nodule**

- **Pure GGN**
  - < 5mm: No additional follow-up required. Annual LDCT if enrolled in lung cancer screening or if multiple ground-glass nodules < 5mm.
  - ≥ 5mm: LDCT in 3 months. If stable, annual LDCT for 3-5 years at least. If increase in size or develop new solid component, consider surgical excision.

- **Part-solid GGN**
  - LDCT in 3 months. If persistent, consider surgical excision. Consider PET/CT if solid component ≥ 10 mm.

- **Multiple SSNs**
  - LDCT in 3 months. If persistent, long-term follow-up LDCT. Consider surgical excision of one or more dominant lesions (part-solid GGN or enlarging pure GGN). Consider PET/CT for part-solid GGNs with solid component ≥ 10 mm.
左下肺10×10 mm结节

抗炎后一个月（同前）

不典型增生
右中叶不规则结节

随访6个月。
原位癌，分期：IA期
随访3个月增大，高分化腺癌
12个月 16×9 mm

15个月 16×9 mm

23个月 20×12 mm

中分化腺癌
胸片（一）

1个月 CT随访（同前）

原位癌
右上叶不规则结节

胸片（一）

3个月 CT随访

腺癌：1A期
右中叶结节

3个月

16个月

5年后轻度增大

腺癌
右上叶结节

一年后 25×15 mm

两年后 25×21 mm

腺癌
成分及实性成分均增多
左下叶结节

一年后 9×8 mm

14个月后 9×8 mm

高分化腺癌
右中叶结节

一年后无变化

胸片（=）

高分化腺癌
5个月，腺癌侵犯胸膜

1个月 10.1×9.6 mm

3个月
Thank you for your presence!