Chest CT Incidentalomas: Lung and Pleural Nodules

Leslie E. Quint
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• 56 F
• Trauma CT
Incidental Lung Nodule

• Small, incidental lung nodules very common in smokers and nonsmokers
• ~ ½ smokers > age 50 have small nodules on thin section CT
• Vast majority are benign
• Many nodules represent granulomas, esp in histoplasmosis endemic areas, e.g. central USA

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

- ↑ chance of malignancy with ↑ size
- <1% of nodules <4 mm in smokers turn into lethal cancers
- ~10-20% of nodules ~8mm in smokers turn into lethal cancers
- Most small incidental nodules are benign

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

• ↑ age correlates with ↑ chance of malignancy

• Lung cancer uncommon < age 40, rare < 35

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

- Look for comparison CT
- Stability $\geq 2$ yrs = benign (solid)
- Benign morphology:
  - Calcification: laminated, concentric, dense central nidus, popcorn
  - Fat = hamartoma
  - Feeding artery, draining vein = AVM
Incidental Lung Nodule

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Incidental Lung Nodule

• Benign morphologic features:
  – Smooth margins
  – Polygonal shape
  – Subpleural location

Xu DM. Radiology 2009;250:264
Incidental Lung Nodule

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Xu DM. Radiology 2009;250:264
Incidental Lung Nodule

Perifissural nodules

• Well-circumscribed, smooth
• Usually triangular or oval
• Contacting or closely related to fissure
• Often with septal attachment
• Usually below the level of the carina
• Prob represent intrapulm lymph nodes
• Low or no chance of malignancy in screening setting

Ahn MI. Radiology 2010;254:949
Xu DM. Radiology 2009;250:264
Intrapulmonary lymph nodes often show septal attachment to pleura.

Ahn MI. Radiology 2010;254:949
Shaham D. Clinical Imaging 2010;34:185
• Intrapulmonary lymph nodes often show septal attachment to pleura

Ahn MI. Radiology 2010;254:949
Shaham D. Clinical Imaging 2010;34:185
ACCP evidence-based clinical practice guidelines for nodules >8 mm

Gould MK. Chest 2007;132:108S
Incidental Lung Nodule

- Fleischner Society guidelines 2005
  - Based on pt risk and nodule size
  - Existence well known among rads
  - Poor compliance with recommendations
    - ? Unfamiliarity with details
    - ? Disagreement with guidelines
    - ? Medicolegal concerns

MacMahon H. Radiology 2005;237:395
Eisenberg RL. Radiology 2010;255(1):218
Quint LE. Academic Radiology, in press
Guidelines for Management of Small Pulmonary Nodules Detected on CT Scans: A Statement from the Fleischner Society

Recommendations for Follow-up and Management of Nodules Smaller than 8 mm Detected Incidentally at Nonscreening CT

<table>
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<th>Nodule Size (mm)*</th>
<th>Low-Risk Patient†</th>
<th>High-Risk Patient‡</th>
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Note.—Newly detected indeterminate nodule in persons 35 years of age or older.

* Average of length and width.
† Minimal or absent history of smoking and of other known risk factors.
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§ The risk of malignancy in this category (<1%) is substantially less than that in a baseline CT scan of an asymptomatic smoker.
‖ Nonsolid (ground-glass) or partly solid nodules may require longer follow-up to exclude indolent adenocarcinoma.
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Incidental Lung Nodule

• Fleischner society guidelines apply only to INCIDENTAL nodules: unrelated to known underlying disease

• Do NOT apply:
  – Known or suspected malignancy that may metastasize to the lungs
  – Unexplained fever

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

• Conservative management often appropriate for:
  – very elderly pts
  – pts with major comorbid disease

• More tests, biopsies, surgery not always indicated

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

Pure Ground Glass (GG) nodules

• <5 mm:
  – Probably atypical adenomatous hyperplasia (AAH)
  – Possibly infection, inflammation, fibrosis, organizing pneumonia, hemorrhage

Alpert JB. RCNA 2011;49:267
Godoy MC. Radiology 2009;253:606
Incidental Lung Nodule

Pure Ground Glass (GG) nodules

• <5 mm:
  – AAH may be premalignant
  – Grow very slowly
  – No follow-up needed

Alpert JB. RCNA 2011;49:267
Godoy MC. Radiology 2009;253:606
Incidental Lung Nodule

Pure Ground Glass (GG) nodules

- 5-10 mm: f/u in 3-6 mos
- If persistent: probably AAH or adenocarcinoma in situ (BAC)
- F/u to assess for stability ≥3 yrs

Alpert JB. RCNA 2011;49:267
Godoy MC. Radiology 2009;253:606
Incidental Lung Nodule

Pure Ground Glass (GG) nodules

• >10 mm: f/u in 3 mos
• If persistent: probably adenoCA in situ (BAC) or invasive adenoCA
• F/u to assess for stability ≥3 yrs
• ? Bx, surgery

Alpert JB. RCNA 2011;49:267
Godoy MC. Radiology 2009;253:606
Incidental Lung Nodule

Ground Glass (GG) nodules

• Malignant correlates
  – Increase in size
  – Increase in attenuation
  – Development of a solid component

Alpert JB. RCNA 2011;49:267
Godoy MC. Radiology 2009;253:606
Poorly differentiated adenocarcinoma
Incidental Lung Nodule

• Follow-up CT technique:
  – Low dose, e.g. 40 mAs
  – Thin section, e.g. 1-2.5 mm, 50% overlap
  – No intravenous contrast

MacMahon H. Radiology 2005;237:395
Incidental Lung Nodule

Conclusions

• Follow Fleischner Society guidelines
  – Pay attention to details
• Recommend longer (≥ 3 year) follow-up for apparently stable ground glass or subsolid nodules