CTC Workflow: Reviewing & Reporting Exams

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Aims

• Explain the workflow involved in interpreting and reporting CTC
  • Environment for Interpretation
  • Quality assurance
  • Common strategies of interpretation
  • Generating a CTC report
Workflow of CTC Interpretation

- Confirm segmentation and map out colon
  - 3D transparency view or coronals
- Quality assurance
  - Distention, stool, fluid, tagging
- Search for polyps using both 3D and 2D
- Characterize and measure polyp candidates
- Secondary CAD-assisted evaluation
- Report (follow C-RADS guidelines)
- Search for extracolonic findings
Supine-Prone Registration
Q.A. CHECKLIST

- Location of segments
  - tortuosity
  - mobility when comparing supine to prone
- Identify ileocecal valve
- Quality of distention
Q.A. CHECKLIST

- Retained stool
  - size
  - tagging
- Retained fluid
  - quantity
  - location
  - tagging
  - change supine – prone
- Artifacts (e.g., metal, breathing)

QA by technologist includes review of axial images for distention
Always Identify IC Valve
Not always intuitive . . .

- Identify by:
  - Location
  - Fat
  - Shape
    - Papillary (dome-shaped)
    - Labial
    - Mixed
Poor Preparation
Excessive untagged feces
Quality Assurance:
The Bottom Line

- Are any segments suboptimal on both views?
- Could a 10 mm polyp be obscured?
Methods of Interpretation

- 3D with 2D problem solving
- 2D with 3D problem solving
- Soft tissue windows for flat lesions
- Bone windows for dense oral contrast tagged fluid and stool
- Virtual Pathology (open views)
- Computer-aided diagnosis (CAD)
Methods of Interpretation

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Basic Feature of Polyps

6 mm Polyp on a Fold
Coated with tagging agent
Non-tagged Stool
Mobile, With Internal Gas

SUPINE

PRONE
Well – Tagged Stool
Lipoma on the ICV
Dedicated Read for Flat Lesions
Wide Soft Tissue Window in 2D

Endoscopic view

Courtesy of J.L. Fidler, MD
<table>
<thead>
<tr>
<th>Polyps</th>
<th>vs.</th>
<th>Stool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid, soft tissue</td>
<td>Compare to muscle</td>
<td>Mottled pattern</td>
</tr>
<tr>
<td>Use wide soft tissue window setting - interactively</td>
<td>Does not move</td>
<td>Use wide soft tissue window interactively</td>
</tr>
<tr>
<td>Not move</td>
<td>Compare supine to prone Decubs as needed</td>
<td>Entire target is mottled</td>
</tr>
<tr>
<td>Use many clues to confidently compare</td>
<td></td>
<td>Not a polyp covered by stool: no “footprint” along wall that is solid</td>
</tr>
<tr>
<td>Nearby folds, tics</td>
<td>Curvature of colon</td>
<td>Moves</td>
</tr>
<tr>
<td>Curvature of colon</td>
<td>Lesion morphology, size</td>
<td>To dependant surface</td>
</tr>
<tr>
<td>If solid; beware of colonic mobility</td>
<td></td>
<td>Axial and sagittal views best</td>
</tr>
</tbody>
</table>

- Polyps: Solid, soft tissue
- Stool: Mottled pattern
Approach to Polyp Candidate Analysis

- Polyp vs. fold > use > 3D or MPRs
- Polyp vs. stool > use > texture (W/L or color map)
  - If solid . . .
    - Compare supine / prone for mobility
      - If mobile, check for long stalk, colonic rotation / flip
Primary 3D Read Strategies

- Forward and backward
- Supine and prone
- Special software features (e.g., color map for polyp characterization, show blind areas)
- Problem solve in 2D as needed as you read
- Bookmark & defer difficult problem solving (e.g., difficult supine/prone comparison)
Primary 2D Read
Learn to “Track the Colon”

- Highly magnified axial
- Go slowly! Look at all surfaces
- Evaluate very short segments as you move along an imaginary centerline
- Use a lung window (1500/-600) setting or “colon” (2000/0)
- Non-magnified or magnified MPR
- Simultaneous or deferred endoluminal comparison
Polyp Transverse Colon
Difficult 2D
Flat Lesions: Use Wide Soft Tissue Window

Supine

Prone
Computer Aided Detection: Integrated Visualization Display
3D Over-measuring Pitfall
“falling off the cliff”

- Use largest dimension on either 2D or 3D to triage management
- Per “C-RADS” 6 mm threshold for reporting polyps
Band View
Cube View
Structured CTC Reporting

- History
- Prep
- Informed of exam limitations
- Technique
- Colon findings
- Extracolonic findings
- C-RADS scores / Recommendations
- Footnote qualifier / reference C-RADS
C-RADS Classification

- C0  Inadequate study (can not evaluate 10 mm lesions)
- C1  Normal, routine follow up (Q 5 yrs CTC)
- C2  Indeterminate; 1-3 yr f/u
  - Polyp 6-9 mm, ≤ 3 in number
  - Findings indeterminate; cannot exclude polyps ≥ 6 mm
- C3 10 mm or ≥3 6-9mm polyps → Colonoscopy
- C4  Mass, likely malignant; surgical consult

Summary

• Both 2D and 3D skills are needed – use it in every case

• Use a systematic approach that involves QA of images, recognition of anatomic landmarks and supine-prone comparison

• Recognize pitfalls and use CAD secondary read

• Report using C-RADS guidelines and recommendations
THANK YOU!

Acknowledgments

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