Collaboration Between Radiologists and Clinicians Improves Identification of Parathyroid Adenoma on 4DCT

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BACKGROUND

• Prior to December 2017, 4DCT rarely ordered at our institution

• Following hire of surgeon with subspecialty training in endocrine surgery, we experienced an increase in orders for 4DCT

• In reviewing preoperative and postoperative scans with the surgeon, we quickly became aware of our low sensitivity in identifying PTH adenoma compared to 93% published in the literature
PLAN objective: improve detection of PTH adenoma by 4DCT

Prediction: review with surgeon will increase sensitivity
METHODOLOGY

• Use PDSA methodology to improve identification of PTH adenomas

• Retrospective review performed following institutional IRB waiver

• Initial cycle: 7 patients scanned prior to review with surgeon from December 2017 to September 2018 with comparison of radiologists’ report to surgical notes and surgical pathology from Epic records

• Second cycle (DO): 30 scans performed between September 2018 and December 2019 with preoperative review of 4DCT with surgeon, in addition to surgical notes and surgical pathology from Epic records
Data pre and post intervention

<table>
<thead>
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<th></th>
<th># patients</th>
<th>% sensitivity for laterality</th>
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<tbody>
<tr>
<td>Radiologist alone</td>
<td>7</td>
<td>43</td>
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<tr>
<td>Radiologist with</td>
<td>30</td>
<td>87</td>
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<td>surgeon feedback</td>
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4DCT scan review

• Scans reviewed for:
  presence or absence of one or multiple candidate lesions
  lesion laterality
  location and size
  lesion enhancement characteristics
  identification of polar vessel
  presence and type of factors limiting evaluation
RESULTS

• Initial study cycle: 43% sensitivity in lateralizing candidate lesions by radiologists alone

• Second cycle: 73% sensitivity for lesion laterality by radiologists alone, increasing to 87% in review with surgeon

• Correlation with surgeon feedback and operative results lead to identification of lesions that did not demonstrate classic imaging features of marked contrast enhancement on arterial phase imaging with washout on delayed images, identification of a polar artery, or those obscured by artifact or located posterior to a thyroid mass
Summary of PDSA cycle

Objective: improve detection of PTH adenoma by 4DCT
Prediction: review with surgeon will increase sensitivity

Collect and analyze data for identification of PTH adenoma by review of 4DCT with surgeon and comparison to surgical results

Changes for next cycle: reduce artifacts limiting PTH adenoma detection by 4DCT

What was learned?
Sensitivity of PTH adenoma detection by radiologist increased two fold by collaborating with surgeon

Collect and analyze data for identification of PTH adenoma by review of 4DCT with surgeon and comparison to surgical results
CONCLUSION

• Clinical feedback aids in increasing radiologists’ sensitivity of interpretation of 4DCT in identifying parathyroid adenomas

• Clinical feedback is essential in quality improvement of radiology results reporting of candidate lesions
References


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