Staging for bony metastases in breast cancer – Are both CT and bone scan required?

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Background

NICE guidelines recommend staging with a bone scan, CT or MRI for staging in advanced breast cancer. Our institution performs a CT of the thorax, abdomen and pelvis as well as a Tc-99m bone scan as a part of routine screening of patients with locally advanced breast cancer. The purpose of this study is to determine if two separate tests are required by comparing the accuracy of CT in diagnosing bony metastasis with the standard bone scan.

Inclusion criteria

• CT and bone scan within 2 weeks of each other.
• Time period: 1.1.2013 to 30.6.2015 (30 months).
• 4 or more node positive patients.
• 2 or more node positive, aggressive cancer.
• Asymptomatic but clinical suspicion.

Exclusion criteria

• Any history of previous malignancy
• Symptomatic patients
• Contralateral breast malignancy

Method

Retrospective analysis (January 2013 to June 2015 inclusive).
All patients who had staging CT CAP and bone scan within 2 weeks of each other with new diagnosis of breast cancer
Staging CT and bone scan imaging reviewed by registrars, more complex cases by consultant.

Sensitivity of CT vs bone scan in detection of skeletal metastases

<table>
<thead>
<tr>
<th></th>
<th>CT positive</th>
<th>CT negative</th>
<th>Total</th>
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<tbody>
<tr>
<td>Bone scan positive</td>
<td>16</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Bone scan negative</td>
<td>5</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>92</td>
<td>113</td>
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Conclusion:

• Our experience shows that CT is highly accurate in staging asymptomatic women with suspected bony metastasis.
• Staging CT picked up 95% of bony metastatic lesions whereas bone scan failed to identify 5 (23%) bone metastases.
• At our trust, a Tc-99m bone scan is significantly more expensive than CT and there is a huge potential cost saving by removing it from the routine work up of patients.
• Instead, extended coverage CT (base of skull to mid femur) may be performed thus reducing radiation dose to the patient as well as being economically beneficial.