Introduction

- Early detection and management of pathologic bone lesions can improve quality of life and functional outcomes
- CT imaging is used for both the initial workup and surveillance of visceral disease and can be valuable for the evaluation of osseous structures
- Scout CT view displays a larger anatomic field not included on tomographic images
- Review of the scout CT view may add diagnostic information without adding any additional radiation to the patient or time to clinical evaluation

Purpose

- The purpose of this study is to evaluate the benefit of reviewing scout CT images, obtained for routine oncologic surveillance, for the early identification of pathologic bony lesions

Methods

- Retrospective review of patients who underwent surgical treatment for pathologic lesions or fractures of the humerus or femur from 2009-2019
- Radiographic records were reviewed to identify patients with available scout views prior to official diagnosis of the bony lesion
- CT scout images were reviewed to identify any pathologic lesions, and radiographic reports were reviewed to identify if the lesions were noted by the radiologist during initial scan interpretation
- Exclusion criteria included: lack of available CT scout imaging prior to initial diagnosis of the lesion, scout images that did not include adequate view of the humerus and/or femur, CT images without a dictation by a radiologist at the time of the study

Results

Demographics:
- Average age: 61 years
- Gender: 66.7% Female
- Ethnicity: 92.3% Caucasian
- Cancer type: 41% Breast; 17.9% Lung
- Site of lesion: 87.2% Femur, 12.8% Humerus

<table>
<thead>
<tr>
<th>Population</th>
<th>Authors (n)</th>
<th>Radiology (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with available scout CT images</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Number of patients with lesions identified on scout CT</td>
<td>25 (64.1%)</td>
<td>9 (23.1%)</td>
</tr>
<tr>
<td>Femur</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>Humerus</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Total number of lesions identified on scout CT</td>
<td>29</td>
<td>10</td>
</tr>
<tr>
<td>Femur</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Humerus</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

- 19/29 (65.5%) of lesions identified by the study authors on scout CT were missed in the initial radiographic interpretation
- Average time between observation by authors and official diagnosis of 202 days
- 1 missed lesion was considered a complete pathologic fracture at the time of scout CT
- 18 missed lesions were considered impending pathologic fractures, defined as:
  - Size greater than one-third the diameter of the bone, location in the proximal femur or humerus, poor remaining bone stock, and specific tumor subtypes
- Of the 18 impending fractures, 3 patients (16.7%) went on to complete fracture prior to referral to orthopedics
- Average between missed lesions on scout CT and presentation with fracture of 68 days

Discussion, cont.

- A significant number of patients with clinically relevant bony pathology could have received an earlier diagnosis and treatment with prophylactic surgery or radiation therapy through careful review of scout CT imaging
- Earlier identification of these lesions with timely stabilization could have prevented complete pathologic fractures
- Existing studies have shown a propensity for unidentified clinical findings on CT imaging when compared to scout CT views, but none are specific to pathologic bone lesions of the appendicular skeleton
- Prophylactic fixation of impending pathologic fractures also has economic benefits compared to acute fracture treatment

Limitations

- Selection bias
- No standardization at our institution for reviewing scout CT imaging
- CT scans in this patient population were obtained for evaluation of visceral disease and osseous structures may not have been a primary focus
- Lack of pain score analysis in determination of impending pathologic fractures

Conclusions

- This study advocates for the careful review of all scout CT imaging as an essential part of the workup for metastatic disease and encourages all practitioners to utilize this screening tool for the identification of pathologic bony lesions which may help expedite early treatment to reduce patient morbidity