Introduction
Bone is one of the most regular sites for metastasis on various carcinomas, being specially common on breast cancer (BC). The early detection of bone metastasis (BM) plays a major role on delivering the appropriate treatment for the patient.

Whole-body bone scintigraphy (BS) with $^{99m}$Tc-MDP is the conventional test to find BM, due to its high cost-benefit ratio; however, BS frequently shows inconclusive findings, making necessary the use of complementary exams.

This study compared $^{18}$F-Fluoride-PET/CT and $^{18}$F-FDG-PET/CT for the diagnosis of BM on BC patients with inconclusive BS.

Results and Discussion
18 patients participated on this study. The inclusion criteria was: sign the informed consent document, show a BS with inconclusive findings for BM, been undiagnosed for BM and accept the realization of $^{18}$F-Fluoride-PET/CT and $^{18}$F-FDG-PET/CT.

The clinical and imaging follow-up identified BM on 12 of the 18 patients with inconclusive BS. The $^{18}$F-Fluoride-PET/CT detected BM on all the 12 patients, while $^{18}$F-FDG-PET/CT only found BM on 9 patients.

On 5 of the 12 BM patients, $^{18}$F-Fluoride-PET/CT diagnosed 26 additional BM, while $^{18}$F-FDG-PET/CT only found extra lesions on 2 of the 12 patients. However, $^{18}$F-FDG-PET/CT detected 48 additional BM, most of then in a single patient.

Together, both exams identified 68 lesions in addition to the 33 confirmed by BS, indicating a higher accuracy in relation to BS. $^{18}$F-Fluoride-PET/CT detected 67 of the 101 lesions, while $^{18}$F-FDG-PET/CT, 72 of the 101.

Chart 1. $^{18}$F-Fluoride-PET/CT and $^{18}$F-FDG-PET/CT sensitivity on detection of lytic, sclerotic, mixed and early stage lesions.

<table>
<thead>
<tr>
<th>Predominant characteristic on CT</th>
<th>Metastatic lesions (n = 101)</th>
<th>Sensitivity $^{18}$F-Fluoride-PET/CT (n = 67)</th>
<th>Sensitivity $^{18}$F-FDG-PET/CT (n = 72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lytic</td>
<td>19</td>
<td>68%</td>
<td>68%</td>
</tr>
<tr>
<td>Sclerotic</td>
<td>26</td>
<td>85%</td>
<td>42%</td>
</tr>
<tr>
<td>Mixed</td>
<td>4</td>
<td>75%</td>
<td>50%</td>
</tr>
<tr>
<td>Early stage lesion</td>
<td>52</td>
<td>55%</td>
<td>88%</td>
</tr>
</tbody>
</table>

Conclusions
On the present study, $^{18}$F-Fluoride-PET/CT was considered the best complementary exam to diagnose BM on patients with inconclusive BS findings.

$^{18}$F-Fluoride-PET/CT had a higher sensitivity for sclerotic and mixed lesions, an equal sensitivity for lytic lesions and inferior sensitivity for early stage lesions. Interestingly, $^{18}$F-FDG-PET/CT detected a large amount of early stage lesions in a single patient; rising significantly his sensitivity for this kind of BM.
