A new type of radiopaque doxorubicin-loaded microsphere created on the Embozene microspheres platform: in vitro characterization and comparison with controls

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Purpose: To compare material characteristics between a new type of radiopaque doxorubicin-loaded microsphere and controls.

Materials: A new type of radiopaque doxorubicin-loaded microsphere (V-100), created on the Embozene Microspheres platform, and controls (DC-Bead-LUMI-70-150 [radiopaque], Embozene TANDEM-100-Microspheres [non-radiopaque] and DC-Bead-M1 [non-radiopaque]) were analyzed. Qualitative, semi-quantitative and/or quantitative CT, light/phase-contrast transillumination/fluorescence microscopy, laser diffraction/light scattering, and/or rheometry were used to describe material characteristics for microspheres in suspension (aqua pure or aqua/iodixanol 320) before and/or after doxorubicin loading (37.5 mg doxorubicin/1 mL sedimented microspheres). Study goals were radiopacitity, doxorubicin loading efficacy, morphology, size distribution, time-in-suspension, rheological properties and stability.

Results: DC-Bead-LUMI-70-150 featured a density of 2432.7 ± 3.2HU and adverse imaging artifacts (blooming and splay artifacts) comparable with iodixanol 320 25%. V-100, Embozene TANDEM-100-Microspheres and DC-Bead-M1 featured densities of 480.4 ± 2.9HU, 118.1 ± 3.0HU and 19.8 ± 1.5HU, respectively, and no adverse imaging artifacts. Fastest relative doxorubicin loading featured DC-Bead-M1, followed by Embozene TANDEM-100-Microspheres, DC-Bead-LUMI-70-150, and V-100, with relative doxorubicin loading of >99% for DC-Bead-LUMI-70-150, Embozene-TANDEM-100-Microspheres and DC-Bead-M1 as well as >98.6% for V-100 after 24hr. For doxorubicin-loaded microspheres in suspension with aqua pure, there were intact and spherically-shaped microspheres with narrow size calibration for DC-Bead-LUMI-70-150, V-100 and Embozene-TANDEM-100-Microspheres and with non-narrow size calibration for DC-Bead-M1. The type of suspension had a marked impact on morphology (not for DC-Bead-M1), size distribution (only for DC-Bead-M1), time-in-suspension, rheological properties (not for DC-Bead-M1), and stability after doxorubicin loading.

Conclusions: The new type of radiopaque doxorubicin-loaded microsphere, created on the Embozene Microspheres platform, is extremely promising and should undergo further scientific evaluation.

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**Abstract No. 706**

Descriptive revenue analysis of 100 patients in an interventional oncology service line: understanding revenue sources in interventional radiology

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Purpose: As interventional radiology (IR) transitions to a clinical revenue source, understanding revenue sources in interventional oncology is extremely promising and should undergo further scientific evaluation.

Table: Rheological Properties

<table>
<thead>
<tr>
<th>Material</th>
<th>V-100 in Suspension with Aqua Pure</th>
<th>Embozene-Tandem 100-Microspheres in Suspension with Aqua Pure</th>
<th>DC-Bead M1 in Suspension with Aqua Pure</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC-Bead-LUMI (70-150) in Suspension with Aqua Pure</td>
<td>1.8\textsuperscript{1} &lt;sup&gt;1&lt;/sup&gt; 204850 Pa\textsuperscript{2} 160478 Pa\textsuperscript{3}</td>
<td>1.8\textsuperscript{1} 92196 Pa\textsuperscript{2} 63480 Pa\textsuperscript{3}</td>
<td>4.5\textsuperscript{1} 59692 Pa\textsuperscript{2} 50049 Pa\textsuperscript{3}</td>
</tr>
<tr>
<td>DC-Bead-LUMI 70-150) in Suspension with Aqua/Iodixanol 320\textsuperscript{4}</td>
<td>11.1\textsuperscript{1} 271890 Pa\textsuperscript{2} 235456 Pa\textsuperscript{3}</td>
<td>2.8\textsuperscript{1} 122410 Pa\textsuperscript{2} 95179 Pa\textsuperscript{3}</td>
<td>4.5\textsuperscript{1} 57111 Pa\textsuperscript{2} 50900 Pa\textsuperscript{3}</td>
</tr>
</tbody>
</table>

\textsuperscript{1}Critical deformation strain of the microspheres (indicating deformability)

\textsuperscript{2}Peak dynamic modulus G’ (indicating elasticity) of the microspheres within the viscoelastic region (or until the critical deformation of the microspheres was reached).

\textsuperscript{3}Mean dynamic modulus G’ (indicating elasticity) of the microspheres within the viscoelastic region (or until the critical deformation of the microspheres was reached).

\textsuperscript{4}Iodixanol 320 50%; type of suspension: aqua pure versus aqua/iodixanol 320 with a marked impact on deformability and elasticity for DC-Bead-LUMI-70-150, V-100, and Embozene-Tandem 100-Microspheres.