Percutaneous afterloading therapy in inoperable liver tumors

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Disclosures

• Nothing to disclose
Background

Major drawbacks of thermal ablation techniques:

• Size limitation 3-5 cm diameter
• Cooling effects of adjacent vessels
• Carbonization
Brachytherapy

- 1898 Radium (Marie Curie)
- 1903 Radium with glass coating
- 1910 Brachytherapy of Endometrial Cancer
Brachytherapy

1966 Remote Afterloading by Henschke

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INTRACAVITARY RADIATION THERAPY OF CANCER OF THE UTERINE CERVIX BY REMOTE AFTERLOADING WITH CYCLING SOURCES*

By ULRICH K. HENSCHEKE, M.D., Ph.D., BASIL S. HILARIS, M.D.,
and G. DAVID MAHAN, B.S.
NEW YORK, NEW YORK

Fig. 2. Remote afterloading of uterus applicators with cycling sources.
Brachytherapy
Equipment
Puncture under CT guidance
Catheters supported by angiography sheaths
Planning of radiation

Pursued tumor surrounding dose : 20 Gy
Brachytherapy in Afterloading technique
Retraction of Catheters
HCC
<table>
<thead>
<tr>
<th>Author</th>
<th>Entity</th>
<th>Pat./Met.</th>
<th>Tumor-diameter</th>
<th>LRR</th>
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<tbody>
<tr>
<td>Ricke et al.</td>
<td>HCC</td>
<td>83/140</td>
<td>3.7 [1-15]</td>
<td>3.9%</td>
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<tr>
<td>Collettini et al.</td>
<td>HCC</td>
<td>102/212</td>
<td>3.8 [0.4-12]</td>
<td>6.1%</td>
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<td>Lori et al.</td>
<td>HCC</td>
<td>69/104</td>
<td>2.2 [10-3.3]</td>
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<tr>
<td>Lencioni et al.</td>
<td>HCC</td>
<td>187/244</td>
<td>2.8 [1.5-5]</td>
<td>10%</td>
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</tbody>
</table>
Two HCC in Seg. IVa/VIII and in Seg. VII/VIII (A), TACE and CT-HDRBT (B, D). At 8 months after therapy, shrinkage of the tumor is visible (D).
HCC measuring 4,5 cm in Seg. 8 (A), TAE (B,C) and CT-HDRBT (D,E). Follow-up Gd-EOB-DTPA-enhanced liver MRI at 24 months shows the shrinking ablation zone with persistent local control of the treated tumour.
Results

- 47 patients enrolled, 78 lesions
- Median diameter 41.2 mm (7-144 mm, median 35.5 mm)
- BCLC A: 4 patients
- BCLC B: 30 patients
- BCLC C: 13 patients
- Median follow-up 25.1 months, 26 had died, 2 LTx, 5 lost to follow-up
Median OS:
- BCLC A: 32.3 months
- BCLC B: 36.9 months
- BCLC C: 27.6 months

<table>
<thead>
<tr>
<th>OS</th>
<th>Avola et al. 2011</th>
<th>TACE + AL</th>
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<td>BCLC B</td>
<td>16.9 months</td>
<td>36.9 months</td>
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<tr>
<td>BCLC C</td>
<td>10.7 months</td>
<td>27.6 months</td>
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</tbody>
</table>
Cholangiocarcinoma
Unresectable Intrahepatic Cholangiocarcinoma

15 patients
Median 16 months
Re current Cholangiocarcin o m a
OS after resection

Median 85 months

Kamphues et al. HPB 2012
OS after recurrence

10 patients
Median 26 months

Kamphues, et al. HPB 2012
# Cholangiocarcinoma

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<td><strong>HDRBT</strong></td>
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<td>Schnapauff et al.</td>
<td>CC</td>
<td>15/28</td>
<td>5.5 [1-18]</td>
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<tr>
<td>Kamphues et al.</td>
<td>CC</td>
<td>10 / 15</td>
<td>3.1 [1-5.5]</td>
<td>6.5%</td>
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<tr>
<td><strong>RFA</strong></td>
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<tr>
<td>Kim et al.</td>
<td>CC</td>
<td>10/17</td>
<td>3.5 [0.8-9]</td>
<td>40%</td>
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<td>Kim et al.</td>
<td>CC</td>
<td>20 /29</td>
<td>1.9 [0.7-4]</td>
<td>24%</td>
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</tbody>
</table>
Take home points

• CT guided brachytherapy is safe
• Interdisciplinary approach
• Cost effective

• Still no randomized trials
Thank you very much!

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