Interstitial Brachytherapy in Cervix- Advancements

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Objectives of the teaching session....

- To understand the concept of ISBT
- To list the Indications of ISBT
- To identify different applicators available
- To know the procedure, plan evaluation
- To understand the benefits with ISBT
Intracavitary Brachytherapy

Interstitial Brachytherapy
Indications for ISBT

- Ca Cervix IIB & beyond
  - If Partial Response
  - Post Op + Parametrium Positive
- Anatomic variations
  - Distorted Goemetry (obliterated fornices)
  - Narrow Vagina
  - OS not identifiable
- Bulky Parametrial Disease
- Vault Recurrences
- Reirradiation
Very important.....
Different applicators available
• Syed-Neblette Universal

MUPIT (Martinez Perineal Interstitial Template)
Vaginal mould brachy..impression after EBRT

Vienna Ring

Tandem ovoids with freehand needles
Tulip applicators....add on with...

Fletcher

Henschke

Ring
Utretcht applicator

Venezia applicator
Selection of the applicator system
Medial third parametrial involvement
Tandem ring with straight needles
Tandem ovoids with freehand
Freehand ISBT
Both para, upto LPW on one side
Para involvement on both sides..
Vault Ca... straight tandem, obturator with needles

Stylet
Vaginal obturator
Template
Needle
Postop/Vault Ca
Vault Cancer with paracolpos, straight tandem, obturator with inner circle on right side on perineal template.
Unilateral paracolpos involved
Tandem/obturator...selective vaginal involvement
Vulva....obturator with additional wires at introitus
Recurrence in vagina
Plan evaluation...
Plan evaluation.. Postop case
Plan evaluation ..Intact uterus
Hyperdose sleeve...should not touch each other as much as possible
Rectum and Bladder evaluation..
### Prescription Dose Rx = 6.50 Gy

#### Plan Quality Indices

<table>
<thead>
<tr>
<th></th>
<th>TR WITHOUT NEEDLES</th>
<th>TR WITH NEEDLES</th>
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<tbody>
<tr>
<td>c1 (V100)</td>
<td>79.0 %</td>
<td>97.1 %</td>
</tr>
<tr>
<td>c2</td>
<td>55.3 %</td>
<td>52.7 %</td>
</tr>
<tr>
<td>COIN</td>
<td>0.436</td>
<td>0.512</td>
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#### Total Dose Volume for 6.50 Gray

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<tr>
<td></td>
<td>64.58 cm³</td>
<td>83.52 cm³</td>
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### hrctv

#### Total Volume = 45.4 cm³, 4692 Control Points

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<tr>
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<tbody>
<tr>
<td>V90</td>
<td>38.3 cm³</td>
<td>84.5 Vol%</td>
</tr>
<tr>
<td>V100</td>
<td>35.8 cm³</td>
<td>79.0 Vol%</td>
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<tr>
<td>V150</td>
<td>24.4 cm³</td>
<td>53.9 Vol%</td>
</tr>
<tr>
<td>V200</td>
<td>14.3 cm³</td>
<td>31.5 Vol%</td>
</tr>
<tr>
<td>D90</td>
<td>5.1 Gy</td>
<td>78.9 %Rx</td>
</tr>
<tr>
<td>D98</td>
<td>3.9 Gy</td>
<td>60.3 %Rx</td>
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<tr>
<td>D100</td>
<td>2.7 Gy</td>
<td>41.9 %Rx</td>
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<tr>
<td></td>
<td>44.8 cm³</td>
<td>98.7 Vol%</td>
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<tr>
<td></td>
<td>44.1 cm³</td>
<td>97.1 Vol%</td>
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<tr>
<td></td>
<td>34.2 cm³</td>
<td>75.4 Vol%</td>
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<tr>
<td></td>
<td>17.3 cm³</td>
<td>38.1 Vol%</td>
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<tr>
<td></td>
<td>8.1 Gy</td>
<td>124.5 %Rx</td>
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<tr>
<td></td>
<td>6.2 Gy</td>
<td>95.1 %Rx</td>
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<tr>
<td></td>
<td>4.4 Gy</td>
<td>68.3 %Rx</td>
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### bladder

Reference Volume = 97.9 cm³, 4746 Control Points

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<th>TR WITH NEEDLES</th>
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<tbody>
<tr>
<td>D2cm³</td>
<td>4.0 Gy</td>
<td>4.0 Gy</td>
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### rectum

Reference Volume = 46.9 cm³, 4976 Control Points

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<tbody>
<tr>
<td>D2cm³</td>
<td>2.7 Gy</td>
<td>2.7 Gy</td>
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ISBT Execution
Results with IGBT

• Potter et al ...2007
  • Local control with lesions more than 5 cm..64% vs 82%
  • Survival..28 % vs 58 %
  • Serious complications...10 % vs 2 %

• Potter et al..2011
  • Local control with lesions 2-5 cm- 98% and >5 cm- 92 %
  • Survival..72 % vs 65 %
  • Serious complications...5 % with
    • D90 >85 Gy
    • D2cc rectum/sigmoid <75 Gy
    • D2cc bladder <90 Gy
To Summarise....

- ISBT effectively covers all types of targets for cervical cancer
- Delivers minimal dose to rectum, bladder, Sigmoid
- Applicators have seen tremendous improvement over the years and are patient friendly
- Computerised plans permit quick planning and evaluation
- All the above have resulted in better therapeutic ratio
Thank You .....happy learning.....