From Point A
to
Image Guided Brachytherapy

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Recommendations from Gynaecological (GYN) GEC-ESTRO Working Group (I): concepts and terms in 3D image based 3D treatment planning in cervix cancer brachytherapy with emphasis on MRI assessment of GTV and CTV


Radioth and Oncol 74, 235-45, 2005

GYN GEC-ESTRO 2005

<table>
<thead>
<tr>
<th>Intermediate Risk CTV at diagnosis</th>
<th>CTV at brachytherapy</th>
<th>ICRU 38 60 Gy</th>
<th>High risk CTV Clinical finding at diagnosis</th>
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<tbody>
<tr>
<td>High Risk CTV</td>
<td>Pt A 85 Gy</td>
<td>MRI based T2 Lesion Gray Area Cervix</td>
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Inverse Planning Simulated Annealing (IPSA)

Dose Objective Parameters Ranges:
- No negative values accepted anywhere.
- Weights go from 0 to 200.
- Maximum value for Dose (Min or Max) could be up to 5000 cGy.
- Margin values are limited to 50 mm.
HIGH-DOSE RATE BRACHYTHERAPY USING INVERSE PLANNING SIMULATED ANNEALING FOR LOCOREGIONALLY ADVANCED CERVICAL CANCER: A CLINICAL REPORT WITH 2-YEAR FOLLOW-UP

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IJROBP 75:1329-1334, 2009

USING INVERSE PLANNING SIMULATED ANNEALING (IPSAS) ALGORITHM TO FACILITATE DOSE PLANNING FOR GYNECOLOGICAL CANCER HDR BRACHYTHERAPY IMPLANT CASES TREATED AT HOSPITAL UNIVERSITARIO LA FE VALENCIA (ESPAÑA)

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GEC-ESTRO, 2011
Image Guided Brachytherapy
Part 1

- Contouring based on GEC-ESTRO definition
- MRI based whenever possible
- Optimization using IPSA or manual adaptation
  - Contouring the ovoids/ring separately
  - Control optimization > manual adjustment

US Guided GYN Procedures

<table>
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<tr>
<th>Year</th>
<th>Description</th>
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</table>
| 1994 | Ultrasound guidance for placement of difficult intracavitary implants  
Rotmensch, J. et al, Gynecol Oncol, 54:159-62 |
| 1995 | Transrectal and transperineal sonography during guided intrauterine procedures  
| 1997 | A new technique for performing Syed-Neblett template interstitial implants for gynecologic malignancies using transrectal-ultrasound guidance  
Image Guided Brachytherapy
Part 2

- TRUS with EUA prior to implant
- Using US image to compliment clinical exam
- Identify normal structure to help with orientation
- Identify tumor when possible
• Image Guided Brachytherapy requires
  • Image guided placement of implant - US/CT/MR
  • Interstitial implant +/- intracavitary applicator
  • 3D image based planning
  • Inverse optimization

• Future of Image Guided Brachytherapy