# Dose Prescription & Treatment Planning including EBRT and BT

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CERVICAL CANCER, FIGO STAGE IIIB, SQ. CARCINOMA GOOD GENERAL CONDITION & RENAL FUNCTIONS ADEQUATE USG / CT: NO GROSS PELVIC OR PA LYMPH NODES

# WHAT WILL BE YOUR TREATMENT PRESCRIPTION?

# TREATMENT PRESCRIPTION

**RADICAL CHEMO-RADIATION** 

**RADICAL RADIOTHERAPY :** EBRT AND FRACTIONATED HDR-BT

- EBRT TECHNIQUE: WHOLE PELVIS WITH BOX FIELD TECHNIQUE

- SIMULATION : CONVENTIONAL / CT BASED

**- DOSE :** 45 Gy / 25# @ 5# PER WEEK

**CONCOMITANT CT:** CISPLATIN 40 mg/m2 x 5-6 CYCLES

**BRACHYTHERAPY BOOST:** 7 Gy TO POINT 'A' ONCE WEEKLY x 4# STARTING FROM 4-5 WEEK ONWARDS

# Clinical Assessment and Patient selection and preparation

- Clinical Assessment
- Patient- selection and preparation
- Brachytherapy Techniques
- Planning Aim
- Example of a clinical assessment and patient documentation

#### Template of Clinical Drawing

#### **At Diagnosis**



Adopted from GYN GEC-ESTRO Teaching Course Material

www.embrace.dk

# Patient Selection (1)

- Cervical Cancer patients treated with radical radio (chemo) therapy
- Radical radiation therapy : combination of External & Brachytherapy
- Brachytherapy: Majority centers practice fractionated High Dose Rate (HDR) System. LDR / PDR are the other systems.
- HDR Brachytherapy: fractionated with 2 6 fractions once weekly depending on FIGO Stage

# Patient Selection (2)

- EBRT : 2D/ BOX FIELD ( DETAILS IN CASE CAPSULES)
- Brachytherapy boost is planned towards the end or after completion of external beam radiation therapy
- Pelvic examination to assess suitability for brachytherapy application
- Brachytherapy Procedure Pre-requisites:
  - Review for fitness to undergo anesthesia
  - Pelvic anatomy and tumor topography suitable for appropriate applicator placement
- **Pre-planning:** Tumor topography, Imaging & availability of applicators.

## Adaptive Radiotherapy BT : TOWARDS THE END OF EBRT



Pre-operative Counseling, Instructions and Preparation

for Brachytherapy Procedure

- Counseling about the procedure in patients language
- Obtain written Informed Consent
- Pre-operative instructions:
  - Preparation of parts (perineum),
  - Bowel preparation by simple enema
  - Nil by mouth at-least 4-6 hours prior to procedure
- Appropriate medications for existing co-morbidities
- Review latest blood investigations (anemia & electrolyte imbalance) and correction accordingly
- Evaluate patient suitability for Imaging (CT / MR)

### Anesthesia for Brachytherapy Procedure

- Principle: Adequate relaxation for cervical dilatation, vaginal packing and application reproducible esp. in fractionated HDR
- Short General Anesthesia: preferred for proper application
- Alternatives if patient high risk for general anesthesia:
  - Spinal anesthesia with epidural anlagesia
  - Sedation and analgesics
  - Regional Blocks: Obturator blocks
  - Local blocks: Para-cervical blocks

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### Brachytherapy Applicators for GYN Cancers









CT Vienna System with Titanium Needles

Tandem - Ring with needles/tubes

Tandem - Ovoid with tubes

## Brachytherapy Techniques (1)

- Intracavitary (IC)
  - Tandem Ovoid, Tandem ring, Tandem cylinder etc.
- Combined Intracavitary and Interstitial (IC + IS)
  - Vienna Applicator, Utrecht applicator, etc.
- Interstitial (IS)
  - MUPIT, Indigenous Templates with needles / tubes





### **LIMITATION OF STANDARD PEAR**

# Brachytherapy Techniques (2)

- Choice of appropriate technique depends on:
  - residual tumor topography at brachytherapy
  - availability of brachytherapy applicators
  - availability of expertise
- In General: depending on residual disease at brachytherapy
  - Disease confined to cervix: IC alone
  - Disease extensions beyond Cervix: IC + IS combination
  - Extensive disease not amenable to IC + IS: IS
- Applications can be modified in subsequent fractions (esp. HDR)

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Radiation therapy Planning Aim (External + Brachytherapy)

• Tumoricidal Doses (All doses in EQD2)

- For primary: 85 90 Gy (External + Brachytherapy doses)
- Pelvic /Parametrium external boost (optional): 50-55 Gy
- Nodes: 45 50 Gy (External) +/- Boost (N+ disease)
- External Beam : 45 50 Gy @ 1.8 2 Gy per fraction
- Brachytherapy (Fractionated HDR Schedule)

- 3 - 4 # of HDR boost @ 7 Gy to Point A / HR-CTV

• OAR' s : Rectum / Sigmoid: 70 -75 Gy EQD2

Bladder : 90 - 95 Gy EQD2