LONDON CANCER
NORTH AND EAST

London Cancer

Radiotherapy for carcinoma of the cervix GUIDELINES

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Radiotherapy for carcinoma of the CERVIX

Indications

- Radical treatment of locally advanced disease IB2 – IVA.
- Patients with stage 1A disease who decline or are unfit for surgery.
- Post-operative patients with high risk features or positive margins

Essential PRE-TREATMENT CHECKS/investigations

- Contrast-enhanced MRI imaging of the pelvis
- Contrast-enhanced CT imaging of the Chest to include abdomen if not imaged on MR
- PETCT scan according to local guidelines
- EUA (ideally with surgeon and oncologist) + biopsy of any suspicious lesions
- If there is hydronephrosis on imaging, this should be stented prior to radiotherapy
- Routine serum biochemistry and FBC
- Optional SCC antigen in patients with squamous cell tumours.
- EDTA-GFR or formal calculation of renal function for all patients to receive concurrent cisplatin chemotherapy
- Pathology, radiology and management plan for all patients should be discussed on an individual basis in the Gynaecology MDT.

Information for patients

Information leaflets may be given on

- Pelvic EBRT and brachytherapy, including expected site specific side effects
- Concurrent chemotherapy with cisplatin

Consent

- Required for all patients according to local guidelines

Trials

- INTERLACE Trial
- DEPICT

Chemotherapy

- Concurrent cisplatin chemotherapy may be used if GFR > 50ml/min.
- Cisplatin 40mg/m^2 (max 70-80mg) weekly for a maximum of 6 weeks during radiotherapy. [Green *et al* Lancet 2001 Sep 8; 358(9284) 781-6]
- Post operative chemoradiation may be considered in patients with high risk pathology such as nodal involvement and/or positive resection margins.

Position / Immobilisation

According to local guidelines and may include

- Supine with knee supports
- Midline and lateral bony pelvis permanent markers.

Planning technique

- 3D planning using CT data
- Use MRI or PET-CT planning where indicated and according to local practice

Imaging required for GTV definition

- Contrast enhanced planning CT Abdomen and Pelvis
- Levels to be defined according to individual patient but usually from L2 - L3 to below the introitus.
- Fusion with diagnostic MRI Abdomen and Pelvis

Dose / Time / Fractionation/ Category (for unscheduled gaps)/ number of phases

- 50.4Gy in 25 - 28 daily fractions over 5-5.5 weeks delivered in a single phase.
- Concomitant chemotherapy should be given (unless medically unfit, inadequate renal function or poor performance status)
- Category 1 patients so no treatment gaps. If gaps are unavoidable, patients should be hyperfractionated

As a simple rule of thumb, consider using the guidelines below:

CTV

- CTV Pelvic Nodes:
    - Obturator, internal and external and common iliac nodes up to the bifurcation of the aorta using blood vessels as a surrogate with a 7 mm margin modified.
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- CTV Tumour:
    - Gross tumour, uterus and parametrium and upper third of vagina (unless there is involvement by disease, in which case a 2 cm margin below apparent disease should be used). Consider inclusion of proximal half of utero-sacral ligaments. Cervix and uterus can be outlined as a separate volume from parametruim and upper vagina unless the INTERLACE guidelines are being followed.

PTV

- PTV Nodes = CTV Pelvic Nodes + 7- 8mm
- PTV parametrium and upper vagina = CTV Tumour + 7mm
- PTV cervix and uterus lateral margins 7mm. Sup/Inf and Ant/Post 12-18mm

However, the alternative is to follow the INTERLACE guidelines to produce PTV1, PTV2, and PTV3 as per table below:

Planning guidelines and expansions from INTERLACE trial

Clinical Target Volume and Planning Target Volume Margins Clinical Target Volume 1 (CTV1)	CTV1 should include the whole cervical tumour and its local extension (GTV). Also, the cervix and uterus.
Clinical Target Volume 2 (CTV2)	Proximal half of the uterosacral ligament, bilateral parametria and upper half of the vagina, or 2 cm below known vaginal disease. If there is uterosacral involvement, the entire ligament needs to be encompassed. The external iliac, obturator, internal iliac and common iliac nodes are also included in this volume. The superior extent is at the aortic bifurcation. The nodal areas are defined by using a 7mm around blood vessels. It should be extended to include visible disease and lymphoceles. It should be modified to exclude bone, psoas muscle, bladder and bowel. The subaortic presacral nodes can be covered by connecting the nodal areas either side of S1 and S2 with a 10 mm strip volume.
Clinical Target Volume 3 (CTV3) (Extended field)	Where nodes at the aortic bifurcation or at the level of the common iliac vessels are positive (histology/CT PET /> 15mm on imaging) the most superior extent of CTV3 will be at the renal hilum. In general, a margin of at least 2cm should be added above the highest involved lymph node region.
Planning Target Volume 1 (PTV1)	Add 15 to 20mm to CTV1 anterior/posterior/superior and inferior, 7 to 10mm in the lateral extension.
Planning Target Volume 2 (PTV2)	Add 7 to 8mm to CTV2.
Planning Target Volume 3 (PTV3)	Add 5 to 7mm to CTV3.

Field arrangement

A 3 or 4 field technique is used to cover the target volume
If IMRT or RAPIDARC is used this is done according to local guidance

Parametrial boost

This is optional

- May be used in patients stage FIGO IIb and above (ie any parametrial extension)
- Plan after 1st HDR brachytherapy insertion
- Fields are matched to 70% isodose from HDR brachytherapy reconstruction onto AP film
- Field Borders:
    - Superior field border - mid SI joint
    - Inferior field border - bottom of obturator foramen
    - Lateral field border - as for previous EBRT field
- Dose: 5.4Gy in 3 daily fractions over 3 days

Extended field

- To be considered in medically fit patients with:
    - Positive Para-aortic lymph nodes (PAN) on lymph node dissection
    - Positive Common Iliac LN where PAN have not been surgically assessed
- PTV:
    - CT planned, outlining the nodes around the aorta plus 7-8mm margin to give PTV PAN.
- Field Borders
    - Superiorly - approximately T12/L1
    - Inferiorly - matched to pelvic volume
    - Width - approximately 8cm but may be amended with reference to the position of the kidneys
- Field arrangement according to local guidelines. Ant and post fields not encouraged
- Dose is 45 Gy in 25 daily fractions over 5weeks

Use of MLC

- As required to spare normal tissue

Critical organs and tolerance doses

- Organs at risk include the rectum and bladder
- Rectal dose for the entire course should be limited to <70-75Gy

PORTAL Imaging

- First 3 fractions and weekly thereafter

Microselectron (HDR brachytherapy)

- Full insertion with intrauterine and intravaginal sources.
- All patients have 21Gy in 3 fractions to 100% or point A.
- External beam and brachytherapy treatment should be completed within 42 to 50 days of the first fraction hence concomitant brachytherapy boost may be necessary.

On treatment review clinics

Patients seen in on treatment review clinic according to local practice

- weekly FBC, Ideal Haemoglobin > 12-12.5g/dl throughout treatment.
- If having chemo weekly biochemistry otherwise week 1 and 5 and as indicated
- Baseline and weekly weight and RTOG toxicities may also be documented.
- Patient to see CNS before and after treatment
- Pelvic after care, information and advice on vaginal dilators.

Follow up after radiotherapy

- Initial review 4 weeks following completion of radiotherapy
- MRI scans of the Abdomen and Pelvis 12 weeks following completion of treatment should be considered if patient is suitable for a salvage surgical approach
- Follow up; Year 1 - 3 monthly; Year 2 - 3 to 4 monthly; Year 3- 4 to 6 monthly; Years 4 and 5- 6 to 12 monthly.
- Follow up after this is at the clinicians discretion
- Referral to menopause clinic advised for pre-menopausal patients

Arrangements for treatment summary

- End of treatment letter to be dictated within 14 days from completion of treatment