I J C R M

International Journal of Contemporary Research In Multidisciplinary

Case Series

Endometrial Cancer: Radiotherapy Treatment

Virginia A.Cirolla (MD, Ph.D. Oncologia)[1*], **L.Frati** [2] **and G.Scarzello**[3]
[1]*UOC Radiotherapy, La Sapienza University, Rome, Italy*
[2]*UOC Oncology, La Sapienza University of Rome, Italy*
[3]*Director IOV Padua, University of Padua, Italy*

Corresponding Author: *Virginia A.Cirolla

DOI: https://doi.org/10.5281/zenodo.11080441

ABSTRACT

The observational study we carried out examines 13 patients affected by K endometrium and subjected to endocavitary HDR treatment after exeretic and OT treatment. Patients underwent HDR; High dose rate brachytherapy (BRT-HDR) endouterine 21 Gy (17-28 Gy) involves a number of sessions varying from 1 to 6, repeated 2 - 7 days apart and with an overall duration for each single session of a few minutes, preceded by the treatment plan preparation procedure. (Centering CT)
GU G3 99% vs 100% p ns GU G4 99% vs 100% p ns 2 patients developed toxicity GU G3-4 GI G3 99% vs 99% p ns GI G4 100% vs 98% p ns 3 patients developed toxicity GI G3-4. Patients are checked 1 month after the end of treatment and symptoms and side effects are monitored. The therapeutic response to treatment and control of the disease over time is good; short-term relapses are absent. Follow-up and instrumental and inspection videos at 1 month, 3,6 12 months (MRI, CT/PET)

Manuscript Information

- **ISSN No:** 2583-7397
- **Received:** 17-03-2024
- **Accepted:** 16-04-2024
- **Published:** 27-04-2024
- **IJCRM:**3(2);2024:186-195

- **Plagiarism Checked:** Yes
- **Peer Review Process:** Yes

How to Cite this Manuscript

Virginia A.Cirolla, L.Frati, G.Scarzello. Endometrial Cancer: Radiotherapy Treatment. International Journal of Contemporary Research in Multidisciplinary.2024; 3(2): 186-195.

KEYWORD: Adenocarcinoma, Eendometrial cancer, Histotype, Radiotherapy, Menopausal Woman.

INTRODUCTION

Endometrial cancer represents the main neoplasm of the uterus and the most frequent gynecological cancer in the most industrialized countries, occupying fourth place among the causes of cancer in women, after breast, colon and lung cancer. It is typical of post menopause and the peak incidence occurs between the ages of 50-70. The fact that this disease is more frequent in richer nations suggests that environmental conditions and lifestyles, typical of these geographical areas, represent risk factors for endometrial cancer. These include diets rich in saturated fats, red meat, and sedentary lifestyles that are not inclined to physical activity. Obesity and overweight also represent significant risk factors for endometrial cancer, as well as for other neoplasms. Other risk factors are related to the hormonal activity of the woman; in particular, early menarche and late menopause, absence of pregnancies, ovarian polycystosis appear to be conditions that favor the development of the neoplasm. Estrogen-only hormonal therapies performed to alleviate the symptoms of menopause once represented a significant risk factor, while today the current estrogen-progestin combination therapies appear to have a protective activity, as does the use of the contraceptive pill in -menopause. Women suffering from breast cancer treated with Tamoxifen have an increased risk of endometrial cancer; therefore, they are subjected to periodic checks to prevent this rare eventuality. There are also hereditary and family factors that can predispose to the development of endometrial cancer. Endometrial cancer represents the main neoplasm of the uterus and the most frequent gynecological cancer in the most industrialized countries, occupying fourth place among the causes of cancer in women,

after breast, colon and lung cancer. It is typical of post menopause and the peak incidence occurs between the ages of 50-70. The fact that this disease is more frequent in richer nations suggests that environmental conditions and lifestyles, typical of these geographical areas, represent risk factors for endometrial cancer. These include diets rich in saturated fats, red meat, and sedentary lifestyles that are not inclined to physical activity. Obesity and overweight also represent significant risk factors for endometrial cancer, as well as for other neoplasms. Other risk factors are related to the hormonal activity of the woman; in particular, early menarche and late menopause, absence of pregnancies, ovarian polycystosis appear to be conditions that favor the development of the neoplasm. Estrogen-only hormonal therapies performed to alleviate the symptoms of menopause once represented a significant risk factor, while today the current estrogen-progestin combination therapies appear to have a protective activity, as does the use of the contraceptive pill in - menopause. Women suffering from breast cancer treated with Tamoxifen have an increased risk of endometrial cancer; therefore, they are subjected to periodic checks to prevent this rare eventuality. There are also hereditary and family factors that can predispose to the development of endometrial cancer. In particular, Lynch syndrome, which is hereditary and associated with a very high risk of colon cancer, can also lead to a 40-60% risk of endometrial cancer. The most frequent histotype is endometrioid-type adenocarcinoma (75-80%).

METHODOLOGY

The observational study we carried out examines 13 patients affected by K endometrium and subjected to endocavitary HDR treatment after exeretic and OT treatment. Patients underwent HDR; High dose rate brachytherapy (BRT-HDR) endouterine 21 Gy (17-28 Gy) involves a number of sessions varying from 1 to 6, repeated 2 - 7 days apart and with an overall duration for each single session of a few minutes, preceded by the treatment plan preparation procedure. (Centering CT) GU G3 99% vs 100% p ns GU G4 99% vs 100% p ns 2 patients developed toxicity GU G3-4 GI G3 99% vs 99% p ns GI G4 100% vs 98% p ns 3 patients developed toxicity GI G3-4. Patients are checked 1 month after the end of treatment and symptoms and side effects are monitored. The therapeutic response to treatment and control of the disease over time is good; short-term relapses are absent. Follow-up and instrumental and inspection videos at 1 month, 3,6 12 months (MRI, CT/PET).

PREVENTION

Primary prevention of endometrial cancer is mainly implemented by correcting lifestyles considered at risk, in particular with regard to eating habits (foods high in saturated fats and sugars, diet low in fiber and with high caloric intake), poor physical activity and excess weight. Particular conditions of hormonal imbalance can be corrected through appropriate therapies, for example the use of the estrogen-progestin pill.

In women who present uncorrectable risk conditions, linked for example to family history or other predisposing situations, it is certainly advisable to carry out periodic gynecological checks including transvaginal ultrasound in order to identify any neoplasms early. In high-risk patients, for example, those suffering from Lynch syndrome, there may be an indication, at the time of menopause or in any case, once the desire for motherhood has exhausted, for preventive hysterectomy surgery.

SYMPTOMS

The initial sign that may lead to suspicion of the presence of endometrial cancer is the appearance of abnormal and/or unexpected vaginal blood loss both during menopause and during fertile age. In the more advanced stages of the disease, there may be pelvic, abdominal, lumbosacral pain, the appearance of lymph node swelling in the groin and consequent edema of the lower limbs and vagina, alterations in intestinal activity and breathing difficulties. Rarely is the diagnosis made accidentally in completely asymptomatic women who undergo follow-up tests

DIAGNOSIS

Every menopausal woman who presents bleeding from the vagina, and every woman of childbearing age who presents abnormal bleeding in the inter-menstrual period, must undergo a gynecological examination and a transvaginal ultrasound, an examination that allows the identification of any neoformations in endometrial level and to establish the risk that it is a malignant neoplasm. Once a suspicious lesion has been identified, biopsy samples must be taken via hysteroscopy for diagnosis. If the histological examination confirms the malignant nature of the lesion, the disease is staged, for which the most accurate method is represented by nuclear magnetic resonance (MRI) with contrast medium of the pelvis to evaluate local invasion, while tomography Axial computed tomography (CT) scan with contrast medium and PET-CT are used to detect any distant metastases.

TREATMENT

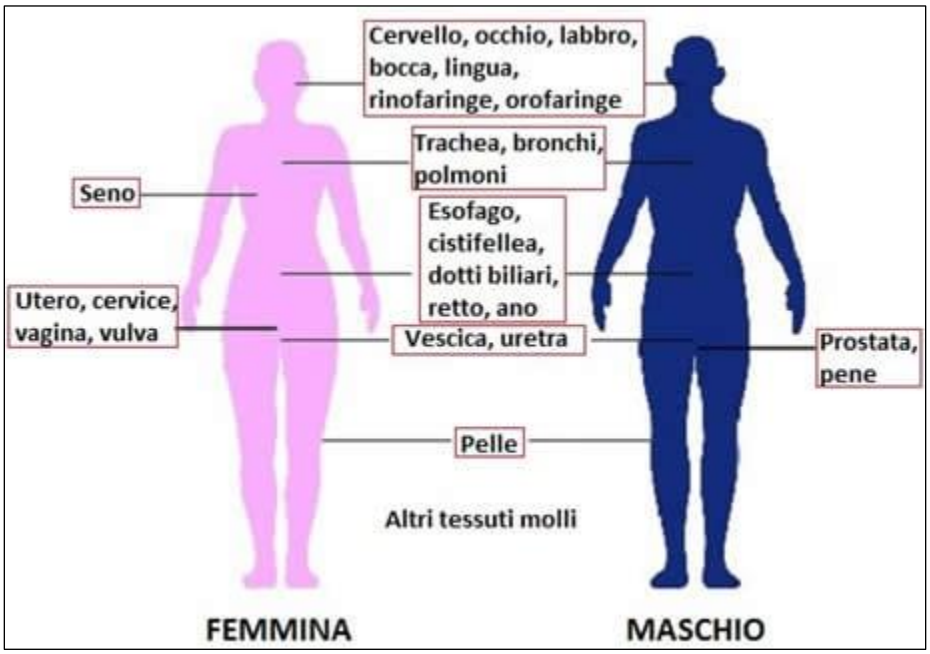
The treatment of early-stage endometrial cancer involves surgery, which includes the removal of the uterus (total hysterectomy) and, with the exception of selected cases diagnosed very early, the tubes, ovaries and pelvic lymph nodes. Based on some parameters, including histological characteristics and the local extension of the disease, patients can then be subjected to post-operative (adjuvant) treatments with the aim of reducing the probability of local and/or distant tumor recovery. These treatments may include pelvic radiotherapy and/or endovaginal brachytherapy and, in cases considered chemotherapy that is more aggressive, in cases of relapsing disease or which is already in an advanced stage at onset, treatment must be established on a case-by-case basis and can benefit from various methods including palliative surgery, radiotherapy and chemotherapy. For some types of endometrial cancer with a less aggressive and more indolent course, a further option is represented by hormone therapy.

FOLLOW UP

The tests to be considered during the follow-up of uterine carcinoma are the general clinical and gynecological

examination (aimed at identifying any signs/symptoms of relapse). This is to be carried out more frequently in the first three years (approximately every 4 months), then every six months until the 5th year. In the absence of clinical indications, the use of more in-depth instrumental tests (CT, RNM or PET/CT) is not recommended.

This follow up strategy derives from literature reviews and expert consensus as to date there is no clear scientific evidence on the role and methods of surveillance. HDR BRACHITHERAPY in the treatment of endometrial cancer.



Brachytherapy is a type of radiotherapy in which radioactive material is placed inside the body, near the tumor to be treated. This explains why brachytherapy is also called internal radiotherapy. The radioactive material, composed of radioisotopes, can be applied to cylindrical supports, small spheres or seeds similar to grains of rice (the choice depends on the needs), then implanted in the most appropriate location to act as an internal source of radiation. This radiation serves to destroy the cells that make up the growing tumor mass. The use of endocavitary applicators is the most common practice

Advantages of Brachytherapy

The main strengths of brachytherapy are three.

The first advantage is to guarantee limited exposure to radiation and less damage to healthy tissues: in fact, unlike what happens with external radiotherapy (which affects a large area of the body), internal radiotherapy only operates on the occupied area from the tumor.

The second advantage is connected to the first and consists in the possibility of increasing the dose of radioactivity emitted by the source, as this is directed exclusively against the tumor mass. In reality, as will be seen later, the quantities of radiation emitted are not always high: in some cases, in fact, a lower dose, but very prolonged treatment is opted for.

Finally, the third advantage concerns the speed of treatment. While external radiotherapy takes place in many sessions (the time between them also allows the tumor residues to resume growth), brachytherapy is immediate and rapid in execution. As will be seen, it does not require any particular instruments and allows the patient, in some cases, to undergo treatment and, at the same time, continue with their daily activities.

The Side Effects

Since brachytherapy exposes you to radiation, it can also produce other side effects, both general and specific.

General Side Effects: are swelling and pain in the area where the radioactive source was placed.

Specific side effects: depend on the tumor in question and the area in which it arises. To find out in detail the consequences of the treatment, it is advisable to consult your doctor.

Preparation

Before starting brachytherapy, the patient suffering from cancer must undergo various diagnostic tests, such as computerized axial tomography (CT) and nuclear magnetic resonance (MRI), to define the location and size of the tumor. Once in possession of this data, a radiation oncologist will plan the most appropriate therapeutic path.

Details of the Procedure
As mentioned, brachytherapy involves positioning a radioactive source near the tumor. This procedure can be carried out in various ways, depending on the size of the tumor, its location and the patient's state of health. The three parameters reported below serve to distinguish the various types of brachytherapy. The only factors that influence the procedure are the characteristics of the tumor and the patient's condition.

- Site of placement of the radioactive source
- Intensity of radioactivity
- Duration of treatment

The Dose of Radioactivity (High or Low Dose Brachytherapy)
Based on the dose of radioisotopes released by the sources, brachytherapy can be divided into high-dose radioactivity brachytherapy and low-dose radioactivity brachytherapy. Here are the implications of each procedure:

- **High Dose Radioactivity Brachytherapy**

In these cases, very powerful radioactive sources are positioned, so much so that the treatment lasts a few minutes (no more than 20) and is repeated a maximum of twice a day, for a few days or weeks. There is no actual hospitalization of the patient, but rather his isolation (in a special room in the treatment center) for as long as the exposure to the radioactive material. At the end of the treatment, the radioactive source is removed and the patient can leave the hospital and return to their daily activities.

Precautions during The Treatment Period: it is important that the patient does not come into contact with anyone (except adequately protected medical personnel), due to the risk of radiation contamination.

Pain or Discomfort during the Treatment Period: high-dose brachytherapy does not usually cause pain; furthermore, the isolation room is equipped with all comforts. Any inconveniences may arise when inserting the sources.

- **Low Dose Radioactivity Brachytherapy**

We resort to the insertion of low-power sources and an exposure lasting many hours, if not days, is expected. Obviously, the patient must be hospitalized and kept isolated as much as possible, despite the low radioactivity. There are rooms equipped with all comforts, in which the patient can feel at ease. Once the therapy is completed, the radioactive material is removed and the patient can return to his daily activities.

Measures during The Treatment Period: Visits to the patient by family members must be reduced to the essential. Furthermore, it is advisable for children and pregnant women to avoid contact with individuals under care.

Pain or discomfort during the treatment period: Generally, low-dose brachytherapy does not cause pain, and if these should arise, medical personnel are still ready to intervene. Some discomfort may appear due to forced isolation or at the time of insertion of radioactive material.

Duration of Treatment (Permanent or Temporary)
Radioactive materials, used for brachytherapy, are not eternal, but undergo the phenomenon of radioactive decay, i.e. the progressive loss of radioactive capacity. This process lasts a few weeks and, once finished, the supports (seeds, cylinders, etc.) are "drained" and without any effect. Radioactive sources can be left in place permanently or removed and replaced at regular intervals. In the first case, we talk about permanent brachytherapy, while, in the second, temporary brachytherapy. In detail:

- **Permanent Brachytherapy**

This method involves the insertion of seeds with very low radioactivity, which, once properly arranged, are left in place even after their decay. In fact, these sources are not harmful to the patient in any way. The dose of radioactive material is so low that the treated individual does not pose any danger to the people around him on a daily basis.

Measures during The Treatment Period: although the risk of spreading harmful radiation is very low, the patient is advised to have close contact with children and pregnant women. This restriction lasts a few weeks or a few months, depending on when the radioactive charge of the source ends.

Pain or discomfort during the treatment period: In some areas of the body, the insertion of seeds can be painful. However, once placed in place, the pain stops and the patient usually does not feel any particular discomfort.

- **Temporary Brachytherapy**

This therapeutic protocol involves the placement, replacement (once decay has occurred) and definitive removal of the radioactive sources. The dose of radioactivity can be low or high, depending on the tumor being treated. The duration of the treatment ranges from a few hours to a maximum of 24 hours, based on the radioactive power of the sources. Patient isolation is required at the time of treatment.

Measures during the treatment period: They are the same as described for high-dose and low-dose brachytherapies of radioactivity.

Pain or discomfort during the treatment period: Insertion may be painful.

The Results
The results and effectiveness of brachytherapy, as with many other anticancer therapies, represent an unknown. In fact, each patient responds to treatment differently and this depends on the characteristics of the tumor, i.e. whether it is serious, infiltrated, benign, malignant, slow growing. In any case, to understand if

there have been any benefits after brachytherapy, it is necessary to carry out diagnostic tests, such as CT scan and PET MRI

Observational Study IOV - University of Padua/LA Sapienza University, UOC Radiotherapy Oncology

The endometrial tumor examined in the observational study is of the endometrioid adenocarcinoma type. It manifests as postmenopausal uterine bleeding. The diagnosis is made by biopsy. Staging is surgical. Treatment requires hysterectomy, bilateral salpingo-oophorectomy, and, for high-risk histology, often pelvic and para-aortic lymphadenectomy. For advanced tumors, radiotherapy, endocrine therapy or chemotherapy are usually indicated.

Endometrial cancer is more common in high-income countries where obesity rates are high. In the United States, this cancer is the 4th most common cancer in women. The American Cancer Society estimates that approximately 66,200 new cases of endometrial cancer will be diagnosed in 2023 and that approximately 13,030 women will die from this cancer. About 80% of these new cases will be early-stage with a good prognosis, and the remaining 20% will have high-grade or advanced-stage disease. In the United States, the incidence of endometrial cancer is higher than average in Black, American Indian, and Alaska Native women (Hispanic 26.1/100,000; non-Hispanic American Indian or Alaska Native 28.8; non-Hispanic Asian or Pacific Islander 22.7; non-Hispanic black 29.4; non-Hispanic white 27.6) (3). Mortality is highest in black women (Hispanic 4.3/100,000; non-Hispanic American Indian or Alaska Native 4.5; non-Hispanic Asian or Pacific Islander 3.5; non-Hispanic black 9.1; non-Hispanic white.

Endometrial cancer mainly affects menopausal women. The median age of patients at the time of diagnosis is 63 years. Most cases are diagnosed in women aged 55 to 64 years.

The risk factors for endometrial cancer are;

• Unopposed estrogen (high serum estrogen levels and no progesterone or low progesterone)
• Age > 45 years
• Obesity
• Taking tamoxifen for > 2 years
• Lynch syndrome
• Previous pelvic radiotherapy

Increased exposure to extrinsic or intrinsic estrogens may be associated with

• Obesity
• Polycystic ovary syndrome or other ovulatory dysfunction
• Estrogen therapy without progesterone
• Nulliparity
• Early menarche
• Late menopause
° Estrogen-secreting tumors

Etiology of Endometrial Cancer

Most endometrial cancers are caused by sporadic mutations. However, in approximately 5% of patients, inherited mutations cause endometrial cancer; endometrial cancer due to inherited mutations tends to occur at younger ages and is often diagnosed 10 to 20 years earlier than sporadic cancer. About half of cases involving heredity occur in families with Lynch syndrome (hereditary nonpolyposis colorectal cancer). Patients who have Lynch syndrome have a high risk of developing other cancers (eg, colorectal cancer, ovarian cancer). Endometrial cancer is usually preceded by endometrial hyperplasia. Endometrial cancer is commonly classified into 2 types.

Type I (Non-Aggressive) tumors are the most common, are usually estrogen-responsive, and are typically diagnosed in obese women and at a younger age (perimenopause or early menopause). They are preceded by endometrial hyperplasia. These tumors are generally low grade; the prognosis is good. Endometrioid adenocarcinoma (grades 1 and 2) is the most frequent histology. These tumors may show microsatellite instability and have mutations in PTEN, PIK3CA, KRAS, and CTNNB1.

Type II (Aggressive) tumors are usually high-grade and include grade 3 endometrioid carcinomas and tumors with nonendometrioid histology (eg, serous, clear cell, mixed cell, undifferentiated, mixed, mesonephric, gastrointestinal mucinous type and carcinosarcomas). They tend to affect older women. Approximately 10 to 30% have p53 mutations (1). Up to 10% of endometrial carcinomas are type II. The prognosis is poor. In approximately 75-80% of endometrial cancer cases, it is endometrioid adenocarcinoma.

There are four distinct molecular subtypes of endometroid endometrial carcinomas:

- **POLE Ultra mutated (POLE mut):** characterized by pathogenic mutations in the exo nuclease domain of DNA polymerase-ε, resulting in ultra-high tumor mutational burden and a good prognosis.
- **Mismatch Repair-Deficiency (MMRd):** presents the loss of mismatch repair proteins, resulting in microsatellite instability and an intermediate prognosis.
- **No Specific Molecular Profile (NSMP [No specific molecular profile]:** it does not have a single identifying molecular characteristic nor outcomes dependent on the stage and grade of the tumor and an intermediate prognosis.
- **p53-Mutant:** has a low tumor mutational burden and somatic copy number alterations resulting in poor prognosis.

Determining molecular subtype, if possible, adds valuable information to standard clinical-pathological risk factors to classify endometrial cancer patients into risk groups, predict prognosis, and guide treatment recommendations.

Uterine papillary serous carcinomas (10%), clear cell carcinomas (<5%), and carcinosarcomas (<5%) are considered histologically more aggressive and high risk and are associated with a higher incidence of extrauterine disease at presentation. Carcinosarcomas used to be classified as sarcomas but are now considered and treated as high-grade epithelial tumors

(carcinomas). Mucinous carcinomas are typically low-grade; the prognosis is good. KRAS mutations are frequent in these tumors. Other histopathological types of endometrial carcinoma are neuroendocrine carcinoma, undifferentiated, and mixed (composed of more than one type, with at least 10% of each component).

Endometrial cancer can spread as follows:
- From the surface of the uterine cavity to the cervical canal
- Through the myometrium to the serosa and into the peritoneal cavity
- Through the lumen of the fallopian tube to the ovary, broad ligament and peritoneal surfaces
- Through the bloodstream, causing distant metastasis
- Through the lymphatic vessels.
- The higher (less differentiated) the grade of the tumor, the greater the likelihood of deep invasion of the myometrium, metastasis to the pelvic or para-aortic lymph nodes, or extrauterine spread.

SYMPTOMS

In most women (>90%) endometrial cancer presents with abnormal uterine bleeding (eg, postmenopausal bleeding, premenopausal intermenstrual bleeding, ovulatory dysfunction). Depending on age and risk factors, 6-19% of women with postmenopausal bleeding have endometrial cancer.

The following signs suggest a diagnosis of endometrial cancer:
- Postmenopausal bleeding.
- Abnormal bleeding in premenopausal women (intermenstrual bleeding, ovulatory dysfunction), particularly in women > 45 years.
- A routine Papanicolaou (Pap) test demonstrating the presence of endometrial cells in post-menopausal women
- A routine Pap smear showing atypical endometrial cells in any woman.

If endometrial cancer is suspected, an outpatient endometrial biopsy is performed; sensitivity is > 90%. An alternative for average-risk menopausal women is transvaginal ultrasound; Biopsy is necessary if the thickness of the endometrial lining is > 4 mm and the results are inconclusive.

If biopsy results are inconclusive or suggest precancer (eg, complex hyperplasia with atypia) or cancer, dilation and curettage (D & C) is done, often with hysteroscopy.

Once endometrial cancer is diagnosed, pre-treatment evaluation includes a complete blood count and other blood tests (serum electrolytes, kidney, and liver). A chest x-ray is performed. If an abnormality is found on chest x-ray, a CT scan should be performed. The following must be considered:
- Pelvic MRI to determine the origin of the tumor (of the cervix or uterus) and local extension.
- For high-grade carcinomas, CT of the chest, abdomen, and pelvis.
- If metastatic disease is suspected based on physical examination or blood tests, positive positron emission tomography-CT because endometrial cancer sometimes results from an inherited mutation, genetic counseling and/or testing should be considered if patients are <50 years old or have a significant family history of endometrial cancer, ovarian, or colorectal cancer, or known Lynch syndrome (hereditary non-polyposis colorectal cancer).

Staging

Endometrial cancer staging is based on nonaggressive versus aggressive histology; the importance of spread, including depth of invasion, extension to surrounding structures, and extrauterine or lymph node metastases; invasion of the lymphovascular space; and molecular classification.

Staging is surgical and includes exploration of the abdomen and pelvis, biopsy or excision of suspicious extrauterine lesions, total abdominal hysterectomy and, in patients with high-risk features (grade 1 or 2 cancer plus invasion deep myometrial, grade 3 cancer, all tumors with high-risk histology), pelvic and para-aortic lymphadenectomy. Staging can be performed by laparotomy, laparoscopically, or robot-assisted surgery. If the cancer appears to be confined to the uterus, an alternative to pelvic and para-aortic lymphadenectomy is sentinel node mapping.

When the molecular classification is known:

POLEmut or p53abn status modifies the FIGO stage in the early phase of the disease. This is represented in the FIGO stage by the addition of “m” for molecular classification, and a subscript is added to indicate the POLEmut or p53abn state. MMRd or NSMP status does not modify early FIGO stages; however, these molecular classifications must be recorded for data collection purposes. When molecular classification reveals MMRd or NSMP, a stage Im or stage Im and stage IIm or stage IIm should be recorded.

FIGO III and IV FIGO stages are based on surgical/anatomical findings. The stage category is not modified by the molecular classification; the molecular classification must be recorded as stage IIIm or stage IVm with the appropriate subscript for data collection purposes;

Sentinel Lymph Node Mapping in Endometrial Carcinoma

Sentinel lymph node mapping may be considered for surgical staging of cancer that appears confined to the uterus, stage I. In many centers, sentinel node mapping is currently the standard for tumors with high-risk histology, i.e. serous papillary carcinoma, clear cell carcinoma, and carcinosarcoma.

The role of sentinel lymph node mapping in endometrial cancer has been evaluated in several studies. The FIRES study demonstrated that, in patients with clinical stage I endometrial cancer, sentinel lymph node mapping with indocyanine green is highly accurate for the diagnosis of endometrial cancer metastases; it has been recommended as a replacement for complete lymphadenectomy. Mapping of the sentinel lymph node is done as for cervical cancer using the same tracers (blue dye, technetium-99 [99Tc], indocyanine green). Sentinel lymph

node mapping can be performed via open or minimally invasive surgery, such as robot-assisted surgery or laparoscopy.
Deciding where to inject the tracer in endometrial cancer patients has been controversial. Evidence suggests that, in endometrial carcinoma, cervical injection with immunochromatographic assay (ICG) results in a higher detection rate than hysteroscopic injection and that the nodal anatomical distribution is similar. The dye is usually injected into the cervix both superficially (1 to 3 mm) and deep (1 to 2 cm) at 3 and 9 o'clock. With this technique, the tracer penetrates the uterine lymphatic trunks (which meet in the parameters) and appears in the broad ligament leading to the pelvic and occasionally para-aortic sentinel lymph nodes.
If sentinel lymph nodes have been identified bilaterally, no lymphadenectomy is indicated, regardless of tumor characteristics. If a sentinel lymph node is not identified on one (or both) sides, a complete lymphadenectomy on that side is required. The possible need for dissection of the para-aortic lymph nodes is left to the discretion of the surgeon

The most frequent locations of pelvic sentinel lymph nodes are
- Medial to the external iliac blood vessels
- Ventral to the internal iliac blood vessels
- At the top of the obturator region.
- Less common locations are the iliac and/or presacral regions.

A complete pelvic lymphadenectomy should be performed when at least one of the following situations occurs:
- Mapping does not detect any sentinel lymph nodes in patients with high-risk tumors.
- A hemipelvis cannot be mapped.
- There are suspicious or grossly enlarged lymph nodes, regardless of mapping. An ongoing randomized phase III trial (ENDO-3) is evaluating sentinel lymph node biopsy without any retroperitoneal lymph node dissection versus lymph node dissection in FIGO clinical stage 1 grade 1-3, endometrioid, clear cell, serous, or carcinosarcoma

Treatment of Endometrial Cancer
• Total hysterectomy and bilateral salpingo-oophorectomy
• Pelvic and para-aortic lymphadenectomy for grade 1 or 2 with deep (>50%) myometrial invasion, for any grade 3, and for all tumors with high-risk histology
• Pelvic radiotherapy with or without chemotherapy for stages II or III
• Multimodal therapy, usually recommended for phase IV

The endometrial tumor must be removed en bloc, performing a total hysterectomy and a bilateral salpingo-oophorectomy. Intraperitoneal fragmentation or morcellation of the tumor should be avoided. Any route (vaginal, open, robotic, and laparoscopic) can perform the surgery. For patients with tumors confined to the uterus, minimally invasive surgery is the preferred approach because its perioperative and postoperative complication rate is lower, hospitalizations are shorter, cost is lower, and oncological outcomes are comparable. Evidence supports comparable oncological outcomes for laparoscopic surgery and laparotomy. In the Gynecologic Oncology Group LAP2 study, women with clinical stages I to IIA uterine cancer were randomly assigned to laparoscopic surgery or laparotomy in a ratio of 2 to 1. The study did not demonstrate statistical noninferiority of laparoscopic approach. However, after a median follow-up period of 59 months, survival rates for both approaches were similar; the 5-year overall survival rate was 90% in both groups. Estimated 5-year recurrence rates were also similar (14% versus 12%). The Laparoscopic Approach to Cancer of the Endometrium (LACE) study was a prospective, international, randomized trial that included 760 patients with stage I endometrioid uterine cancer they were randomly assigned to either a laparoscopic hysterectomy or an open hysterectomy. The 4.5-year disease-free survival (82% vs. 81%) and overall survival (mortality: 7.4% vs. 6.8%) were similar. In patients with grade 1 or 2 endometrial cancer and <50% invasion, the probability of lymph node metastasis is <2%. In these patients, treatment usually consists of total hysterectomy with bilateral salpingo-oophorectomy via laparotomy, laparoscopic or robot-assisted surgery. However, for young women with stage IA or IB endometrioid adenocarcinoma, ovarian preservation is recommended to preserve ovarian function. If patients present with any of the following symptoms, pelvic and para-aortic lymphadenectomy is also performed (unless sentinel node mapping identifies bilateral sentinel nodes):

Treatment of Endometrial Cancer
- Total hysterectomy and bilateral salpingo-oophorectomy
- Pelvic and para-aortic lymphadenectomy for grade 1 or 2 with deep (>50%) myometrial invasion, for any grade 3, and for all tumors with high-risk histology
- Pelvic radiotherapy with or without chemotherapy for stages II or III
- Multimodal therapy, usually recommended for phase IV

The endometrial tumor must be removed en bloc, performing a total hysterectomy and a bilateral salpingo-oophorectomy. Intraperitoneal fragmentation or morcellation of the tumor should be avoided. Any route (vaginal, open, robotic, and laparoscopic) can perform the surgery. For patients with tumors confined to the uterus, minimally invasive surgery is the preferred approach because its perioperative and postoperative complication rate is lower, hospitalizations are shorter, cost is lower, and oncological outcomes are comparable. Evidence supports comparable oncological outcomes for laparoscopic surgery and laparotomy. In the Gynecologic Oncology Group LAP2 study, women with clinical stages I to IIA uterine cancer were randomly assigned to laparoscopic surgery or laparotomy in a ratio of 2 to 1. The study did not demonstrate statistical noninferiority of laparoscopic approach. However, after a median follow-up period of 59 months, survival rates for both approaches were similar; the 5-year overall survival rate was 90% in both groups. Estimated 5-year recurrence rates were also similar (14% versus 12%). The Laparoscopic Approach to

Cancer of the Endometrium (LACE) study was a prospective, international, randomized trial that included 760 patients with stage I endometrioid uterine cancer. They were randomly assigned to either a laparoscopic hysterectomy or an open hysterectomy. The 4.5-year disease-free survival (82% vs. 81%) and overall survival (mortality: 7.4% vs. 6.8%) were similar.

In patients with grade 1 or 2 endometrial cancer and <50% invasion, the probability of lymph node metastasis is <2%. In these patients, treatment usually consists of total hysterectomy with bilateral salpingo-oophorectomy via laparotomy, laparoscopic or robot-assisted surgery. However, for young women with stage IA or IB endometrioid adenocarcinoma, ovarian preservation is recommended to preserve ovarian function. If patients present with any of the following symptoms, pelvic and para-aortic lymphadenectomy is also performed (unless sentinel node mapping identifies bilateral sentinel nodes):

The observational study we carried out examines 13 patients affected by K endometrium and subjected to endocavitary HDR treatment after exeretic and OT treatment. Patients underwent HDR; High dose rate brachytherapy (BRT-HDR) endouterine 21 Gy (17-28 Gy) involves a number of sessions varying from 1 to 6, repeated 2 - 7 days apart and with an overall duration for each single session of a few minutes, preceded by the treatment plan preparation procedure. (Centering CT)

GU G3 99% vs 100% p ns GU G4 99% vs 100% p ns 2 patients developed toxicity GU G3-4 GI G3 99% vs 99% p ns GI G4 100% vs 98% p ns 3 patients developed toxicity GI G3-4. Patients are checked 1 month after the end of treatment and symptoms and side effects are monitored. The therapeutic response to treatment and control of the disease over time is good; short-term relapses are absent. Follow-up and instrumental and inspection videos at 1 month, 3,6 12 months (MRI, CT/PET)

CONCLUSION

GU G3 99% vs 100% p ns GU G4 99% vs 100% p ns 2 patients developed toxicity GU G3-4 GI G3 99% vs 99% p ns GI G4 100% vs 98% p ns 3 patients developed toxicity GI G3-4. Patients are checked 1 month after the end of treatment and symptoms and side effects are monitored. The therapeutic response to treatment and control of the disease over time is good; short-term relapses are absent.

REFERENCES

1. Rdioter.Oncologica Minerva Medica, Linee Guida AIOM
2. Burke WM, Orr J, Leitao M, Salom E, Gehrig P, Olawaiye AB, Brewer M, Boruta D, Herzog TJ, Shahin FA, SGO Clinical Practice Endometrial Cancer Working Group. Endometrial cancer: a review and current management strategies: part II. Gynecologic oncology. 2014 Aug 1;134(2):393-402.
3. Creutzberg CL, Nout RA. The role of radiotherapy in endometrial cancer: current evidence and trends. Current oncology reports. 2011 Dec;13:472-8.
4. Kong A, Johnson N, Kitchener HC, Lawrie TA. Adjuvant radiotherapy for stage I endometrial cancer: an updated Cochrane systematic review and meta-analysis. Journal of the National Cancer Institute. 2012 Nov 7;104(21):1625-34.
5. Berman ML, Ballon SC, Lagasse LD, Watring WG. Prognosis and treatment of endometrial cancer. American journal of obstetrics and gynecology. 1980 Mar 1;136(5):679-88.

Figure 1: BRACHYTHERAPY CARE PLAN

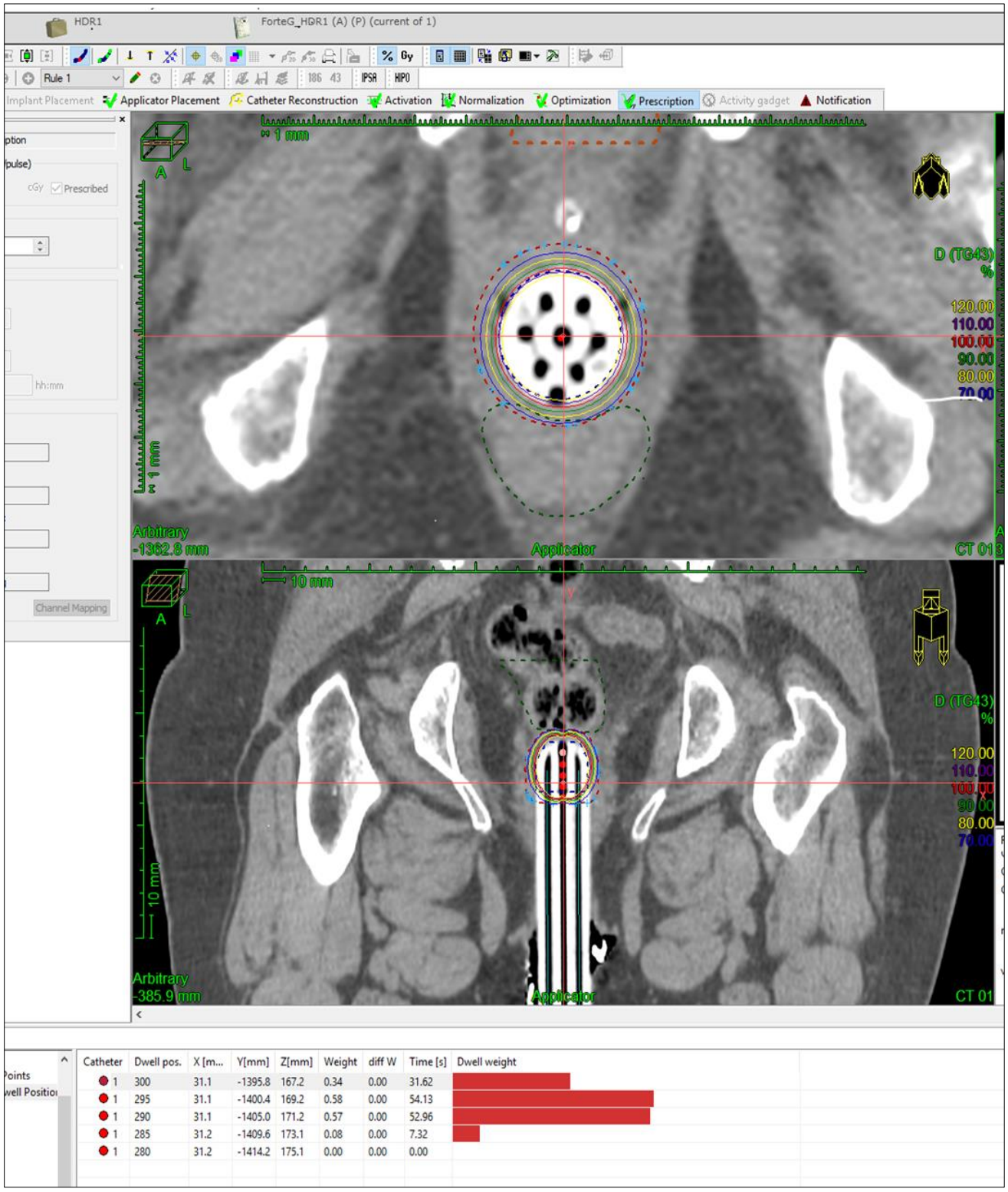


Figure 2: BRACHYTHERAPY CARE PLAN ENDOMETRIAL CANCER