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Case Report

Prostate Adenocarcinoma

VIRGINIA A. CIROLLA
MD, PHD (Oncology), U.O.C. Oncology, Radiotherapy Oncology Department
La Sapienza University of Rome, Italy

Corresponding Author: *VIRGINIA A. CIROLLA

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Abstract

Background: Prostate adenocarcinoma is the most common malignancy in men in Italy, with generally favorable survival rates when detected early. Despite multiple treatment options, disease recurrence remains a clinical challenge.

Case Presentation: Reported the case of a 78-year-old male with recurrent prostate adenocarcinoma initially diagnosed in 2009 (PSA 29 ng/mL). The patient underwent treatment with Casodex followed by external beam radiotherapy (62 Gy in 2010). Subsequent follow-up revealed biochemical recurrence and multiple local recurrences confirmed on PET/CT imaging. Over the years, the patient received androgen deprivation therapy (Enantone), anti-androgens (Casodex, Enzalutamide), and repeat imaging demonstrated progression with prostate and seminal vesicle involvement.

Investigations: Serial PSA monitoring, multiparametric imaging (PET/CT with 18F-Choline, PSMA PET), and CT scans of thorax and abdomen identified recurrent lesions in the prostate, ribs, and lymph nodes, as well as coexisting renal and bladder changes.

Management and Outcome: The patient was managed with hormonal therapy and radiotherapy, with intermittent biochemical control. In 2025, PET findings indicated persistent disease activity, and the patient was scheduled for re-irradiation with radiotherapy in July 2025.

Conclusion: This case highlights the complexity of managing recurrent prostate adenocarcinoma after definitive therapy. Multimodality imaging and individualized treatment strategies remain crucial for long-term disease control in elderly patients.

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EPIDEMIOLOGICAL DATA

In Italy, prostate cancer is the most prevalent malignancy in the male population, accounting for 18.5% of all cancers diagnosed in men. Estimates for 2020 indicate approximately 36,074 new cases annually nationwide. Despite its high incidence, the risk of a fatal outcome is relatively low, especially with timely intervention. From 2015 to 2020, a 15.6% decrease in mortality rates was observed.

This is further highlighted by survival data: on average, 92% of patients are still alive five years after diagnosis, one of the highest rates for any type of cancer, which is particularly significant considering the advanced average age of patients.

Classification by Histological Grade

The histological classification of prostate cancer, following the Gleason system, assigns a score ranging from 2 to 10, based on

the morphological analysis of glandular cells. According to this system, prostate cancer is divided into five grade groups, with group 1 corresponding to the lowest grade. A higher Gleason score is associated with a poorer prognosis. This classification methodology aligns prostate cancer with the grading of other cancer types, highlighting an increase in severity with increasing histological grade.
This is further highlighted by survival data: on average, 92% of patients are still alive five years after diagnosis, one of the highest rates for any type of cancer, which is particularly relevant considering the advanced average age of patients.

Symptoms, Diagnosis, and Risk Factors of Prostate Cancer
Prostate cancer does not present clearly distinguishable symptoms. Observable clinical signs are also commonly associated with benign prostatic hyperplasia, a condition prevalent in men over 50 years of age. These symptoms include:
• Decreased urinary flow;
• Frequent urination, both day and night;
• Episodic urinary urgency;
• Pain during urination;
• Episodic hematuria.
Symptoms typically appear when the tumor mass reaches a size large enough to put pressure on the urethra. In early stages or with small tumors, symptoms may not be evident. Furthermore, prostate cancer is often characterized by slow growth, resulting in symptomatic latency lasting for years.

Diagnosis
When evaluating prostate health, the clinical approach may include the use of the PSA (Prostate-Specific Antigen) test and digital rectal examination (DRE). The latter is performed on an outpatient basis by a primary care physician or urologist and can identify prostatic nodules.
Prostate biopsy is the only reliable diagnostic method for detecting cancer cells in prostate tissue. In this context, multiparametric magnetic resonance imaging (MRI) has acquired a key role in assessing the appropriateness and method of biopsy. The procedure is performed under local anesthesia, on an outpatient or day-hospital basis, and is of limited duration. Using a rectal ultrasound probe, approximately 12 tissue samples are taken through a special needle, transrectally or transperineally (the area between the rectum and the scrotum). The samples are then analyzed under a microscope by a pathologist to identify cancer cells.

Prostate Cancer Treatments
There are many types of prostate cancer treatments available today, each with specific benefits and side effects. Only a careful analysis of the patient's characteristics (such as age and life expectancy) and the disease (type and progression of the disease) will allow the urologist or oncologist to develop the most appropriate and personalized strategy and to coordinate treatment based on the patient's preferences.
In some cases, especially for elderly patients or those with concomitant serious illnesses, it is possible to choose not to implement any treatment and simply "wait": this is what Anglo-Saxons call "watchful waiting," a "vigilant wait" that does not involve treatment until symptoms appear.
In patients with low-risk disease characteristics, there are therapeutic options that allow treatment to be postponed until the disease becomes "clinically significant", initially carrying out only fairly frequent checks (PSA, rectal exam, biopsy) that allow the evolution of the disease to be monitored and any changes that warrant intervention to be identified ("active surveillance").
When it comes to active therapy, however, the choice often falls on radical surgery. Radical prostatectomy—the removal of the entire prostate gland and the lymph nodes in the region surrounding the tumor—is considered curative if the disease is confined to the prostate. Thanks to significant improvements in surgical instruments, prostate removal can now be performed traditionally (open retropubic radical prostatectomy) or robotically.
For advanced-stage tumors, surgery alone often fails to cure the disease, requiring additional treatments such as radiation therapy or hormone therapy.
For prostate cancer, among the treatments considered standard, external beam radiotherapy has also been shown to be effective in low-risk tumors, with results similar to those of radical prostatectomy.
Another radiotherapy technique that appears to offer similar results to the previous ones in low-risk diseases is brachytherapy, which involves inserting small "seeds" into the prostate that release radiation. When prostate cancer is metastatic, unlike other cancers, chemotherapy is not the first-line treatment; hormone therapy, known as androgen deprivation therapy, is preferred instead. This aims to reduce testosterone levels—the male hormone that stimulates the growth of prostate cancer cells—but it brings with it side effects such as decreased or eliminated sexual desire, impotence, hot flashes, weight gain, osteoporosis, loss of muscle mass, and fatigue.
For patients with advanced, castration-sensitive prostate cancer (i.e., resistant to the suppression of male hormones through surgery or hormone therapy), many new therapies are on the horizon. These involve the use of new hormonal agents, combined with older-generation hormone therapy. Some of these therapeutic solutions will also be available in Italy as new standard short-term treatment options.
For patients with castration-resistant prostate cancer and bone metastases, radiometabolic therapy can be used. This approach relies on the ability of certain radiopharmaceuticals, such as radium-223, to target areas of high bone turnover and deliver high-energy particles there that can destroy tumor cells.
Numerous therapies have proven effective in clinical trials: among these, molecularly targeted therapies (target therapy) such as, for example, PARP inhibitors, which can be used in particular in men who have mutations in the BRCA genes, the same ones involved in breast and ovarian cancer, and the new

radiometabolic therapy with 177Lu-PSMA-617 Prostate cancer is an abnormal tissue aggregation in the prostate gland, characterized by uncontrolled cell proliferation, predominantly in the peripheral region of the gland. There are several forms of prostate cancer, including squamous cell neoplasms, neuroendocrine tumors, transitional cell carcinomas, prostatic stromal tumors, and mesenchymal tumors. Histological classification is based on the Gleason system, which assigns a score from 2 to 10 based on the morphology of glandular cells, with a higher score associated with a poorer prognosis.

Diagnosis is based on PSA testing and digital rectal examination, while prostate biopsy is the most reliable diagnostic method. Risk factors include advanced age, ethnic origin, and a family history of prostate cancer.

Treatment options vary depending on patient characteristics and disease status, ranging from "watchful waiting" to active treatments such as radical surgery, radiotherapy, brachytherapy, and hormone therapy. Furthermore, for advanced cases, new therapies are available, such as PARP inhibitors and radiometabolic therapy with 177Lu-PSMA-617

CASE REPORT

Patient History

Date: 03/10/2018

Family History: Denies a family history of cancer.

Physiological: 2 children, Height 1.85 m, BW 90 kg, Varied and balanced diet, Denies smoking or alcohol use.

Bowel movement: regular,

Urinary output: physiological

Allergies: penicillin.

Treatment: Metformin, Enantone 11.25 mg, Casodex 50 mg.

Remote Pathological

1. Tonsillectomy at age 18.
2. Left femoral head replacement 2015.
3. Repeated inguinal hernia (last operation 2005).
4. Glucose intolerance treated with Metformin.

Date: October 3, 2018

Pathological Update

Prostate cancer diagnosed in 2009 (PSA 29), for which he underwent treatment with Casodex 150 and then radiotherapy from May 20, 2010, to June 22, 2010, 62 Gy, 3.1 Gy each, to the prostate.

PSA (October 30, 2013): 3.6 ng/ml, for which he began therapy with enantone 11.25.

PET positive (September 3, 2013): local prostatic recurrence.

PSA 10, May 10, 2018: 1.1 ng.

PET CT performed (May 15, 2018): increased prostatic uptake as in 2013, and at the L1 and VIII rib.

PSa 08.30.18: 1.43 ng/ml

PSA 02.10.18: 1.77ng/ml

DIARY: Date: 03/10/2018

78-year-old patient with recurrent prostate adenocarcinoma who had previously undergone RT in 2010 (total dose 62 Gy) at S.N. Filippo Neri.

Latest PSMA PET (05/09/2018): intense focal hyperfixation in the right lobe of the prostate gland with a further focal hyperfixation inferior to the previous one in the midline, apparently closely adjacent to the anterior rectal wall. No further areas of pathological fixation were found in the remaining body segments examined.

PSA 02/10/2018: 1.77 ng/ml.

CT scan of 06/09/21:

SKULL: negative

THORAX: micronodules in the post-LSD and lateral-basal segments of the LSI, and a further parafissural nodular formation in the lateral segment of the LM, worthy of comparison with any previous tests. Dysventilatory streaks in the apical segment of the LID. Lymph node formations with a short axis <1 cm in the retrocaval, precarinal, and at the level of the FAP.

ABDOMEN: Kidneys in place, with a 3 cm simple cyst on the left DM. In the cortex, between the middle and lower third of the right and the middle third of the left, a nodular formation of the DM measuring 1.8 cm and 0.9 cm, respectively, is inhomogeneous and vascularized, a suspected productive lesion worthy of further diagnostic investigation.

Bladder with thickened walls. In the prostatic cavity, the presence of tissue of questionable nature requires correlation with clinical and anamnestic data. Lymph nodes with short-axis length <1 cm at the mesentery level, along the iliac chains, in the obturator and inguinal regions. BONE: morphostructural course with a wedge-shaped appearance of L1 with displacement of the posterior wall that imprints the dural sac and a "biconcave" lens appearance of L4. The drug is delivered. Complete EEGs are delivered for collection. TCTB with contrast medium 03.03.2022: SKULL-NECK. No density alterations or areas of pathological enhancement are observed in the brain. Diffuse hypodensity of the perivascular white matter due to chronic vascular disease. Normal size and morphology of the cerebral ventricles for age. Periencephalic CSF spaces of normal size. Midline on axis. No lymph node swelling of pathological significance was observed in the laterocervical, posterior cervical, submandibular, and supraclavicular areas bilaterally. The thyroid gland was of normal size, free of any nodular formations that could be detected using the method.

THORAX: Accessory azygos lobe.

The solid non-calcified nodule of 4 mm diameter in the anterior segment of the LSS and the micronodule in the posterior segment of the LSD remained substantially unchanged. Some dysventilatory striae at the basal pyramid of the LID with associated traction bronchiectasis. Pleural and pericardial cavities free of effusion. The main airways are patent. No lymph node swelling of pathological significance in the hilar and mediastinal areas. Bilateral breast hypertrophy during BAT therapy.

ABDOMEN: Liver of normal size, with regular margins and preserved parenchymal structure, in which no significant lesions due to secondary disease are observed. No dilation of the intra- and extrahepatic bile ducts. Gallbladder distended, with regular walls, free from calcified lithiasic formations in the context. Patent spleno-portal axis of normal caliber. No pathological changes were observed in the spleen, pancreas (in

fibro-adipose involution), and adrenal glands. The kidneys were of normal size, with preserved cortico-medullary thickness. The well-known Bosniak type III complex cystic formation with a rounded morphology was slightly increased in size (23 mm vs. 20 mm), presenting a focal hyperdense area adherent to the pseudocapsule (approximately 10 mm vs. 8 mm), which showed irregular thickness in the middle third of the right kidney.

The two remaining cortical cystic formations in the left kidney remain unchanged: a complex cyst in the middle third of DM 14 mm and a simple cyst at the lower pole of DM 32 mm. No dilation of the calycopyelitis cavities bilaterally. The nephrographic phase is valid and simultaneous. The bladder is distended with slightly thickened walls with post-actinic fibrosis. The prostate is enlarged (DT 47 mm) and diffusely inhomogeneous in the post-contrast phase due to post-actinic findings. The fluid image shows pseudocystic characteristics and a small air-fluid level, likely a diverticulum of the third portion of the duodenum. Colonic diverticulosis. Some lymph nodes with subcentimeter short-axis measurement at the level of the mesenteric fan and in the obturator region. The peritoneal cavity is free of effusion. Calcific atheromatous disease of the aorto-bisiliac axis with ectasia of the right common iliac artery (DT 21 mm). Scans visualized with a bone window did not demonstrate any focal lesions suspicious for secondary localizations of the disease. Wedge fracture of L1 with retrolisthesis of L1 on L2. Depression of the superior somatic limiting artery of L4. Left hip prosthesis in place 16/06/25June, PSMA PET: The tomoscintigraphy scan shows diffuse and pathological radioconcentration in the prostatic parenchyma, with evidence of a more focal and intense area of fluorocholine uptake (maximum SUV 8.68) in the left paramedian region. Further focal radioconcentration is observed in the right seminal vesicle (maximum SUV 5.76). Given the resolution of the technique (approximately 5 mm), no further areas of pathological radiopharmaceutical fixation are observed in the other body regions examined.

Presence of disease with high phospholipid turnover in the prostatic region and in the right seminal vesicle.

ENZA and referrals are submitted for the next radiotherapy scheduled for July 23, 2025.

GLOBAL BODY POSITRON EMISSION TOMOGRAPHY [PET] WITH OTHER DRUGS

GLOBAL BODY POSITRON EMISSION TOMOGRAPHY [PET] WITH OTHER DRUGS

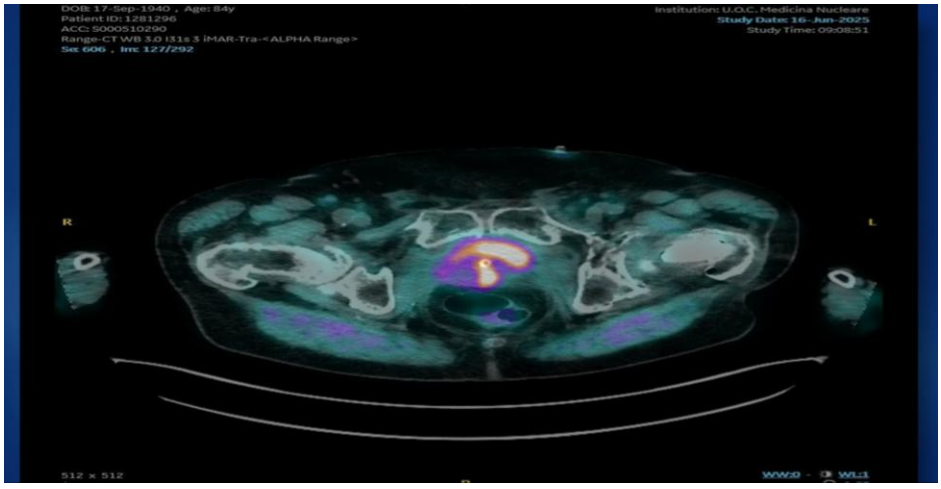
Reevaluation of elevated phospholipid metabolism disease in a patient with prostate cancer diagnosed in 2009. PSA at diagnosis was 29 ng, followed by OT with Casodex and prostatic cavity radiotherapy in 2010 for recurrence. PSMA PET scan on September 5, 2018, documented intense focal fixation in the right lobe of the prostate gland, with a further focus inferior to the previous one in the median region, apparently closely adjacent to the anterior rectal wall. Radiotherapy of the prostatic cavity followed. PET PSMA 07/15/2019 Documented further recurrence in the prostate for which he started tp with Enzalutamide and remained on F.U. Last CT TB of 03/03/2022 in review. PSA rising (March 2025 1.57ng/ml).

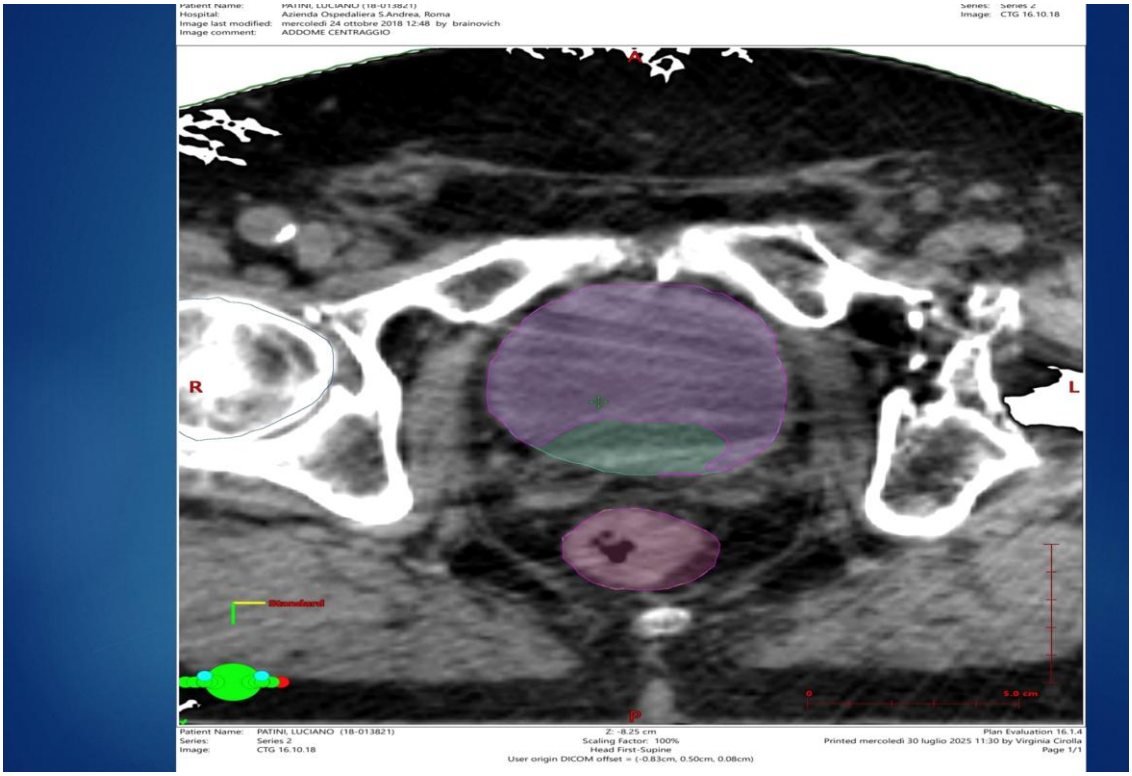
The examination was performed using PET/CT, after intravenous administration of 18F-Choline, and using 3D imaging. Images of the distribution of the cell viability radiopharmaceutical from the vertex to the knees were acquired. Multi-planar tomographic sections corrected for photon attenuation were reconstructed using low-dose (non-diagnostic) CT.

The CT scan showed diffuse and pathological radioconcentration in the prostatic parenchyma, with evidence of a more focal and intense area of fluorocholine uptake (maximum SUV 8.68) in the left paramedian region. Further focal radioconcentration was observed in the right seminal vesicle (maximum SUV 5.76).

Given the resolution of the technique (approximately 5 mm), no further areas of pathological fixation of the radiopharmaceutical were observed in the other body regions examined.

Presence of disease with high phospholipid turnover in the prostate and affecting the right seminal vesicle.





PRESCRIZIONE MEDICA E VERIFICA MEDICO - INFERMIERISTICA TERAPIA ALLESTITA

La terapia è: □X CONFERMATA □ DA CONFERMARE

*** Modifiche tecnico-farmaceutiche apportate dal Farmacista

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		Enzalutamide 160 mg/die		□Fisiologica □Glucosata5%	□ 100 □ 500 □.....	□ 250					
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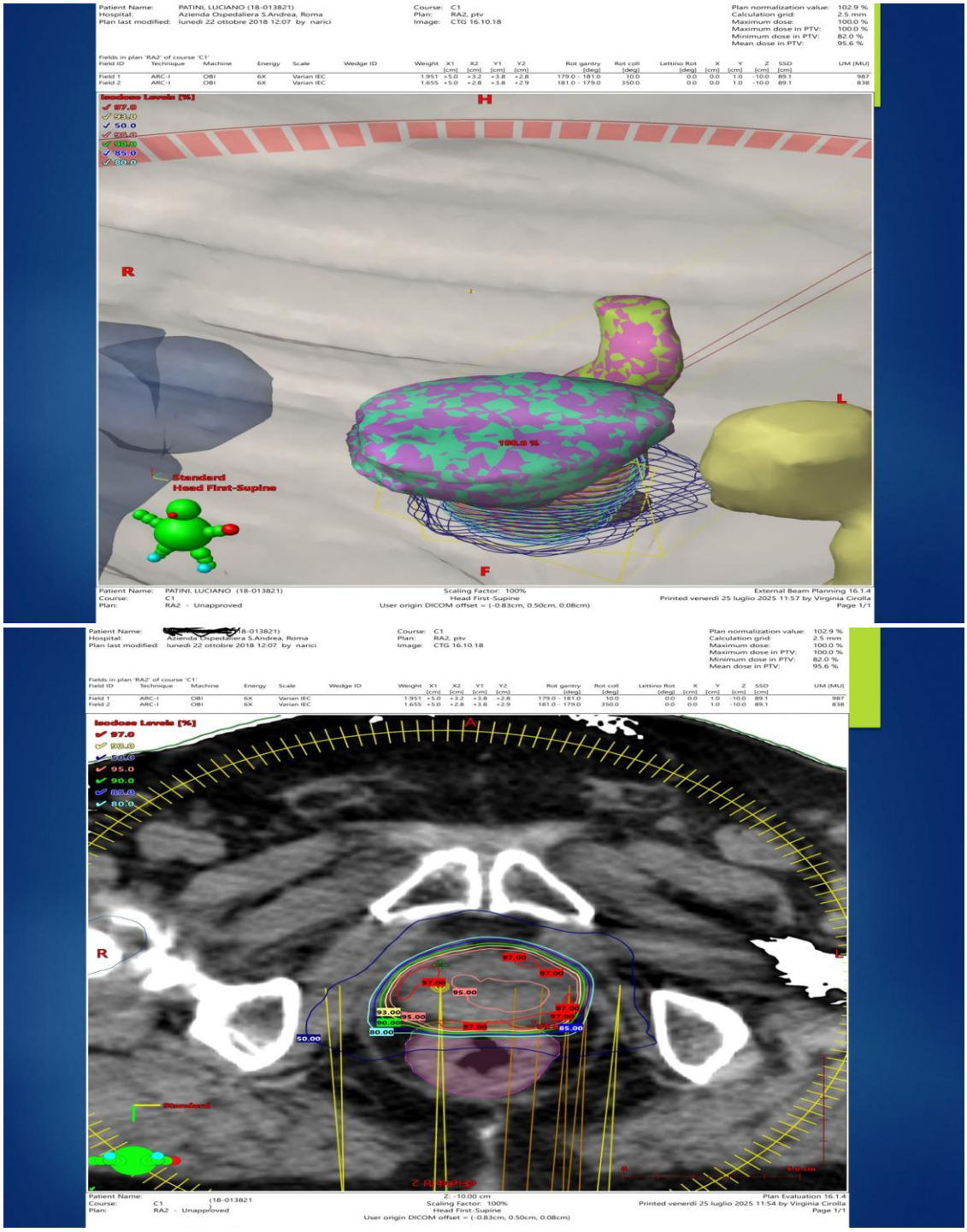

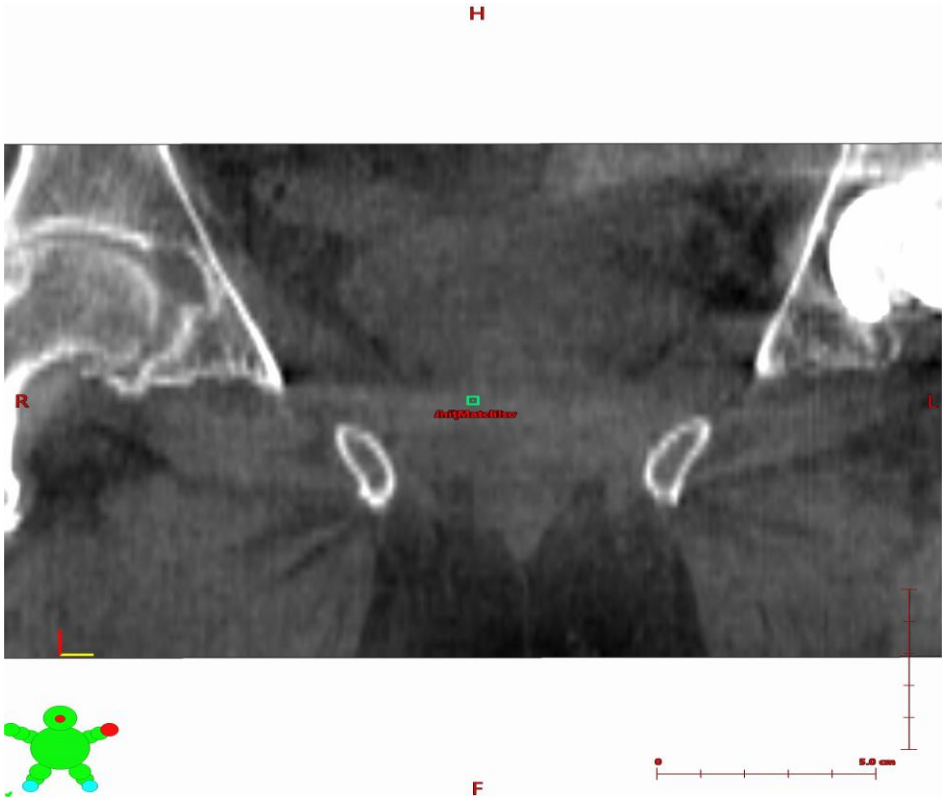

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About the Corresponding Author

Dr. Virginia A. Cirolla is a medical oncologist and researcher specializing in radiation oncology. She serves in the U.O.C. Oncology, Radiotherapy Oncology Department at La Sapienza University of Rome, Italy. With both medical and doctoral training in oncology, her work focuses on advanced cancer therapies, clinical oncology research, and improving patient outcomes through radiotherapy innovations.