**QNO.1.Explain when a patient will be needed Radiation therapy.**

**Answer….**

**\*Introduction..**

Radiation as bee in effective tool for the treating cancer are more than 100year.

Radiation is usually the Treatment of choice for squamous cells carcinoma to the cervix, dependent in the stage of the cancer.

**\*Definition….**

Radiation means Emission (produce) and proportion (Treatment) of energy through space or through a material medium in the form of waves.

**\*PURPOSE…**

>TO kill the cancer cell.

>To shrink the tumor.

>TO make the tumor easier to remove.

\*patient receive Radiation therapy before or after surgery may receive Radiation therapy alone with out surgery. Some patients receive Radiation therapy and chemotherapy same time. Timing Radiation therapy depends types of cancer Treated Goal cure or palliation radiation therapy before surgery Pre-operative.

Neoadjuvant Radiation given to shrink tumor adjuvant radiation therapy

**\*TYPES…..**

**There are two types….**

\*1 External Radiation therapy

\*2 internal Radiation therapy

**>1 External Radiation therapy.**

It refers to Radiation delivered from a source place it same distance from the target site.

**>2 Internal Radiation therapy…**

It involves placement of specially prepare radioisotopes direct in to or near the tumor itself or to the systemic circulation

**\*Mechanism of action Radiation.**

The are explain by direct or target theory and indirect theory.

* Direct. Radiation energy acts by a direct hit the target molecules with the cells.
* Cause by ionization and ejection of the orbital electron. The cause damage is the cell.
* DNA.molecule as the important target Radiation on the cell, especially linkage and bonds.
* **DOSE…..**
* Technique….

Teletheraphy sources of Radiation as a distance from the lesion. Superficial x-rays therapy energy range (60-100) kev for small superficial lesions skin

* + Deep x-ray therapy. Energy ranges (200-300)kev small shallow lesion.
  + Super voltage therapy, linear accelerator (1Mevto 20Mev)
  + Total body irradiation. A Radiation therapy technique used to prepare body to receive a bone marrow transplant.

**\*SIDE EFFECTS.**

\* PAIN

\* FATIGUE

\* NAUSEA

\* SKIN IRRITATION

**\*PLANNING RADIATION THERAPY..**

Skin marking or tattoos immobilization device.

Casts headrest Molds.

**\*Late side effects..**

**>**Fibrosis

**>**Hair loss

>Dry mouth

>complications in breast

**\*Complications of radiotherapy.**

The immediately complication see with an minute or days after irradiation.

Skin erythema, chromosomes aberrations, hematological depression etc.

Human beings damage the epithelial surface. Mouth,

Throat sores, intestinal discomfort infertility,

Swelling.

**QNO.2. Write a short note on the following.**

1. **Image-guided radiation therapy(IGRT).**

**Answer…..**

Image guided therapy real time imaging of the tumor.

Provide compensation for involuntary movement from breathing and for change in size of tumor during Treatment. This system higher quality verification images and allows another radiotherapy tech called (IGRT).

IGRT aims further increase the accuracy of radiotherapy TX by accounting for daily changes such as the organ motion turn help reduce some associated treatment side effects.

Some tumor is not fixed position with an the body.

Exact location change slightly day to day, IGRT involve determine position of the tumor every day before any radiotherapy TX then altering the setting TX positioning if tumor is removed.

**B). Tomography…**

**Answer. Introduction**

The word Tomography is derived from Greek.

Tomo mean(slice)and graph (to write)

A large series of two dimensional x-ray images ‘slice, of the inside of an object are taken around a single axis of rotation.

Digital geometry processing is used to generate three dimensional images of the object from those slices. Tomography is a well accepted imaging modality for evaluation of entire body.

\***Advantages.**

**\*** to overcome superimposition of structure.

**\*** to improve contrast of the image.

**\*** to measure small differences in the tissue contrast.

**\* Various parameters.**

**1)** slice

**2)** matrix

**3)** pixel

**4)** voxel

**5)** CT number

**6)** windowing

**7)** windowwidth

**8)** window level

**9)** pitch

**C) Intensity Modulated Radiation Therapy(IMRT).**

**Answer..**

**IMRT** uses hundred of small Radiation beams modifying devices called collimator to convey single dose of Radiation of collimator can be in motion during Treatment allowing the intensity of the Radiation beam to change during Treatment sessions. This kind of variation allow different area a tumor or nearby tissue to receive different doses of Radiation.

**D). Stereotactic Radiosurgery.**

**Answer..** Stereotactic. It provide Radiation therapy in fewer sessions using smaller Radiation field and higher doses than 3DRCT in most cases. It is usually given in more than one dose. It can be use to treat only small and single tumors including cancer in lung and liver.

**E). Proton Therapy..**

**Answer.** Proton therapy, also called proton radiation therapy, the type of radiation therapy. Use protons instead of X-rays to the treat cancer.

  The proton as positively charged particle. It high energy, protons can kill cancer cell. They can also combine this with radiation therapy, surgery, chemotherapy and.

  X-rays proton therapy is a type of radiation therapy. It provides radiation through the skin of machine outside the body without an pain**.**

### **Treatment planning**

Proton therapy requires planning. Before treatment, you will have a specialize  (CT) or  (MRI) scan. During this scan, you will be an the exact same position is a during Treatment.

**QNO3: What are the potential side effects of radiation therapy?.**

### **Answer.. Potential side effects.**

Radiation therapy a local treatment. The mean that only affect the area of body where the tumor as located.

**\*Common side effects of radiation therapy include.**

**\*Skin problems.**Some people who receive radiation therapy experience dryness, itching, blistering, or peeling. Those side effects depend an which part of body receive radiation therapy. Skin problems usually a few weeks after treatment end. The skin damage become a serious problem doctor have change patient treatment plan.

**Fatigue.**Fatigue describe feeling tired almost all the time. level of fatigue often depend in your treatment plan. example, radiation therapy combine with chemotherapy may result an more fatigue.

### **\*specific side effects of radiation therapy.**

**\*Head and neck.** Radiation therapy aim a person head or neck may cause these side effects:

1)Dry mouth

2)Mouth and gum sores

3)Difficulty swallowing

4)Stiffness in the jaw

5)Nausea

6)Hair loss

7)Type of swelling called lymphedema

8)Tooth

**\*Chest.**Radiation therapy aim the chest may cause those side effect.

1)Difficulty swallowing

2)Shortness of breath

3)Breast or nipple soreness

4)Shoulder stiffness

5)Cough, fever, fullness of the chest, known radiation pneumonitis. These happens b/w 2 week and 6 month after radiation therapy

6)Radi fibrosis, which cause permanent lung scars from untreated radiation pneumonitis.

**\*Stomach and abdomen**

Radiation therapy aim the stomach or abdomen may are cause those side effects.

1)Nausea and vomiting

2)Diarrhea

**\*Pelvis.**Radiation therapy aim the pelvis may are cause those side effects.

1)Diarrhea

2)Rectal bleeding

3)Bladder irritation

men and woman have different symptoms.

**\*Potential side effects for men include here**.

\*Sexual problems, such is erectile dysfunction, which the inability get or maintain in erection

\*Lowered sperm counts and reduced sperm activity. These can occur from to radiation therapy the testes or prostate. At may affect a man's ability father a child.

**\*For women:**

\*Changes in menstruation, such as have a menstruation stop.

\*Symptoms of menopause, vaginal itching, burning, and dryness

**\*Infertility,** is the inability to conceive to a child or maintain pregnancy. These may occur if both ovaries receive radiation therapy.

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