

The Precision of Proton Therapy for Prostate Cancer

Introduction

- Prostate cancer is the most common cancer among men; affecting every 1 in 7 (American Cancer Society, 2016).
- Prostate cancer can be treated with proton beam therapy (PBT) due to it being non-invasive, having a high cure rate, and directly targeting the tumor (The National Association for Proton Therapy, 2014).
- PBT is commonly compared to Intensity Modulated Radiation Therapy (IMRT).
- There are very few disadvantages that are outweighed by the advantages.

Prostate Cancer

- A slow-growing condition where the cells in the prostate grow uncontrollably.
- Adenocarcinoma is the main type (American Cancer Society, 2016).
- Risk factors: Being over the age of 50, being African-American, and a family history of prostate cancer (American Cancer Society, 2016).
- Treatment begins after the stage of cancer is diagnosed. Then, a biopsy is performed and is given a Gleason score.

PBT

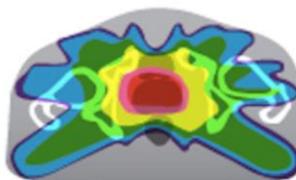
- PBT is non-invasive, has a high cure rate, and directly targets the tumor
- Rapid recovery with a higher quality of life. Ninety percent of men had similar urinary, bowel, and hormonal measures when compared to a healthy individual (Seattle Cancer Care Alliance, n.d.).
- Data from the National Association for Proton therapy reported remarkable cancer-free survival and cure rates.
- Protons minimize radiation to surrounding organs by directly targeting the tumor (Wisensbaugh et al., 2014).
- Cost and unavailability are the disadvantages (The National Association for Proton Therapy, 2014).

Alternative Modality

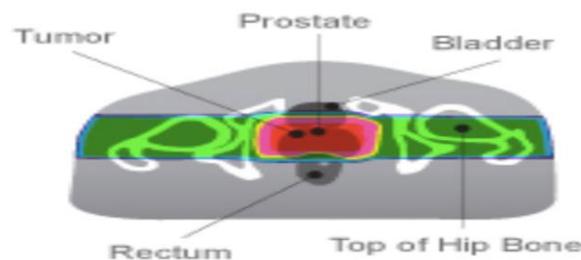
- Proton therapy produces protons, while IMRT produces photons.
- IMRT consists of many small beamlets, so the dose of radiation is not as precise and the dose is mostly outside of the target (The National Association for Proton Therapy, 2014).
- Proton beam radiation produces an increase in robust DNA damage, cell apoptosis, and cytotoxicity when compared to IMRT(Mitteer, et al., 2015).

X-RAYS/IMRT

These images show the areas around the prostate exposed to radiation during treatment.



PROTONS



Figures 1 & 2. Comparison of radiation treatments for prostate cancer (ProCure Training and Development Center, n.d.).

Conclusion

Aside from the very few disadvantages, the treatment option that best treats prostate cancer is undecidedly proton therapy; considering it has innumerable benefits that protect the overall health of the patient. Proton therapy is non-invasive, has a high cure rate resulting in a lower risk for recurring prostate cancer, and minimizes radiation to surrounding tissues and organs with its precision. Prostate cancer is a very common and critical condition that requires prompt treatment. With immediate proton therapy treatment, the estimated number of 26,730 deaths per year from prostate cancer could be reduced significantly.

References

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