Sudan University of Science and Technology
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Evaluation of Entrance and Exit Doses in Tangential Fields in Breast Cancer Treatment. SAD and SSD Techniques

The Thesis Submitted for partial Fulfillment of the Requirements of MS.c Degree in Radiotherapy Technology

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Dedication

This work is dedicated to

My parents, who pray a lot for my success, my brothers and sisters for their endless support and kindness. To my teachers and colleagues
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List of Abbreviation

SAD Source to Axis Distance 4
SSD Source to Skin Distance 5
SEER Surveillance Epidemiology and End Results 8
DCIS Ductal Carcinoma In Situ 9
LCIS Lobular Carcinoma In Situ 9
TNM tumor, lymph node, metastasis 11
NPI Nottingham Prognostic Indicator 11
FNA Fine Needle Aspiration 16
HER-2 Human epidermal receptor-2 16
HBMI High body mass index 17
DNA Deoxyribo Nuclear Acid 18
ROS Reactive oxygen species 18
R.O.P Relative output 28
EFF Electron Filter Factor 28
SPSS Statistical Package for Social Studies 32
3D Three Dimension 33
ABSTRACT

The carcinoma of the Breast is a common disease in Sudan, about 51.5% of 10 common cases, 195 out of 379 cases during 2008 in National Cancer Institute-Madani-Sudan. Appendix-A(1), For radical treatment the external beam therapy is common, given via two tangential fields cover the area of the breast, chest wall and parasternal lymph nodes by a dose around 5000 cGy in 25 fractions, 5 fractions per week.

This study conducted at the National Cancer Institute in the period from July 2009 to December 2009. The main objective of this study is to evaluate the sum of entrance and exit doses of tangential fields in Breast cancer for SAD and SSD techniques to find out the differences whether it is within the acceptable limits or not. The radiation dose was measured and evaluated during the planning course using the THERAPLANPLUS. The data analysis by using Statistical Package for Social Studies and from Appendix (4.1) the correlation is 0.972, is significant. And by using t-test the value:

\[(P-value = 0.000 < 0.05)\]
Indicate that there is difference between two variables so from Appendix(4.1) and other Appendices, there is difference between the two variables. The last results reveal that the dose increase by increasing separation in case of SAD, and the skin dose is higher in case of SAD than in SSD.

الخلاصة

يعتبر سرطان الثدى من أكثر السرطانات شيوعاً في السودان، يمثل 51.5% من المائة من أكثر عشرة حالات شائعة، 951 من 379 حالة خلال العام 2008. بالمعهد القومي للسرطان بمدني - السودان، نظر ملحق ب(1). يعتبر العلاج الإشعاعي الخارجي للثدى علاجاً جذرياً يعطى في شكل حقلين تماثلين متصادين يغطي كل الثدى والغدد الليمفاوية المجاورة. يعطى المريض 5000 سيتر في 52 جلسة خلال خمسة أسابيع. تم جمع البيانات بالمعهد القومي للسرطان بمدني خلال الفترة من يوليو 2009 حتى أغسطس 2009.

الهدف العام من الدراسة تقييم مجموع الجرعة الداخلية والجرعة الخارجية SSD و SAD و جرعة الرئة للحقلين المنسوجين لسرطان الثدى في حالة تقنية ال THERAPLANPLUS. تم حساب الجرعة الداخلية والخارجية وجرعة الرئة خلال عملية التخطيط ومن خلال جهاز توزيع الجرعة التي تسمى Statistical. تم تحليل البيانات إحصائياً من خلال برنامج إحصائي يسمى Statistical Package for Social Studies. اختلاف معنوي بين المتغيرين في الدراسة.
من الملحق (4.1) تم حساب معامل الارتباط بين المتغيرين 0.972 وهو معنوي . اما بالنسبة لاختبار- فان قيمة :

\[ P-value = 0.000 < 0.05 \]

ما يدل على رفض فرضية عدم الاختلاف معنوية بين المتغيرين من الملحق (4.1) ومن الملاحظة الأخرى ينصح أن هناك اختلاف بين المتغيرين , النتائج السابقة توضح ان الجرعة تزيد بزيادة المسافة في حالة SAD وان جرعة السطح اعلى في حالة SAD منه في حالة SSD .

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