

Acknowledgements

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Dedication

**To my husband , my brother and
my beloved parent**

Abstract

The aim of this study was to compare between the accuracy of two immobilization devices as the Head fix and the thermoplastic cast for cancer patient's radiotherapy based on the field shift.

The study carried out among 50 cancer patients received external radiotherapy for head and neck cancers. 25 patients were irradiated under Head fix device and the other 25 patients were irradiated under cast.

Electronic portal images obtained during their first fractions of treatment and with viewing of superimposition of the obtained images the shift in mm was determine in the antero-posterior (AP) and cranio-caudal (CC) directions with respect to the simulator verification images for lateral fields were determined using off-line review of electronic portal imaging system.

The analysis showed that in casting AP direction, a 52% of the patients encountered an anteroposterior field shift of 2 mm, 24% of patients having a field shift as 3 mm, 12% of the patients having a field shift as 1 mm and 12% of the patients were precisely reproduced in position i.e. not any noticed shift. While in casting CC direction there were 4% of the sample were encountered a 4 mm shift in CC direction, 20% were having 3 mm shift and 52% were having 2 mm shift in CC direction.

However in fixed head and neck tumors irradiation in AP direction, the data showed that there were 12% of the patients encountered a 4 mm shift in AP direction, 44% of the patients were encountered with 3 mm shift in AP direction which is marginal; and the rest of sample were within the limit of permissible shift. While in fixed head CC direction, the data showed that 12% of the samples were having a field shift of 4 mm, 40% of the samples were having a field shift of 3 mm (marginal) while the rest of the samples were within the limit.

The statistical analysis also revealed that in case of Casting-AP and Fixing-AP, the average shift in the radiation field was 1.88 ± 0.93 and 2.6 ± 0.82 mm respectively, While in case of Casting-CC and Fixing-CC direction, the data showed that the average shift in the field of radiation was 1.92 ± 1 and 2.5 ± 0.96 respectively, which indicating that the casting immobilization device is better than the head fix immobilization device.

الخلاصة

كان الهدف من هذه الدراسة هو المقارنة بين دقة جهازي التثبيت (جهاز القناع و جهاز تثبيت الرأس) البلاستيكي لعلاج مرضى السرطان بالإشعاع من الخارج بناء على الإزاحة في حقل الإشعاع . أجريت الدراسة على خمسين 50 فرد من مرضى السرطان الذين يتلقون العلاج الإشعاعي في الرأس و العنق . خمسة و عشرون مريضاً تم إشعاعهم و تثبيتهم بواسطة جهاز القناع و الخمسة العشرون الآخرون تم إشعاعهم و تثبيتهم بواسطة جهاز تثبيت الرأس ، و من ثم تم الحصول على صور الكترونية للمرضى أثناء تلقيهم الجلسات الإشعاعية الأولى . تمت مطابقة تلك الصور لتحديد مدى إزاحة الحقل الإشعاعي في الاتجاهين الأمامي-الخلفي و الراسي الزيلي بناء على صور مرجعية تم أخذها بواسطة جهاز التماثل .

أظهرت الدراسة أن 52% من المرضى لديهم إزاحة في الحقل الإشعاعي قدرها 2 ملم ، 24% منهم لديهم إزاحة حقلية قدرها 3 ملم ، 12% منهم لديهم إزاحة في الحقل قدرها 1 ملم و البقية ليس لديهم إزاحة و ذلك عند استعمال القناع في الاتجاه الأمامي-الخلفي . بينما كانت الإزاحة في الاتجاه الراسي الزيلي بقدر 4 ملم ل 4% من المرضى ، و 3 ملم ل 20% من المرضى ، و 2 ملم ل 52% من المرضى بينما البقية ليست لديهم إزاحة في الحقل الإشعاعي .

عند استعمال جهاز تثبيت الرأس-العنق اتضح أن هناك 12% من المرضى لديهم إزاحة في الحقل الإشعاعي بقدر 4 ملم ، و 44% منهم لديهم إزاحة بقدر 3 ملم و البقية ليست لديهم إزاحة و ذلك في الاتجاه الأمامي-الخلفي . بينما في الاتجاه الراسي-الزيلي أوضحت الدراسة أن هناك 12% من المرضى لديهم إزاحة في الحقل بقدر 4 ملم ، و 40% من المرضى لديهم إزاحة بقدر 3 ملم و بقية المرضى ليس لديهم أي إزاحة في الحقل .

كما أوضحت الدراسة أن استخدام جهاز القناع في تثبيت مرضى السرطان أفضل من استخدام جهاز تثبيت الرأس و ذلك يبرر بمتوسط الإزاحة الأصغر نسبيا عند استخدام القناع (0.93 ± 1.88 ملم) مقارنة بمتوسط إزاحة الحقل عند استخدام جهاز تثبيت الرأس (0.82 ± 2.6 ملم) و ذلك في الاتجاه الأمامي-الخلفي ، وبمقدار (1 ± 1.92 ملم) للقناع مقارنة بمقدار (0.96 ± 2.5 ملم) لتثبيت الرأس وذلك في الاتجاه الراسي-الزيلي .

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