

The study aimed to investigate the direct effects of gamma radiation on physical properties of PICC” Zhang et al (2016).

Abstract:

Peripherally inserted central catheter (PICC) has been widely used to treat cancer patients. It is unknown whether or not it can be applied safely during radiotherapy. The study aimed to investigate the direct effects of gamma radiation on physical properties of PICC.

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A total of 60 catheters were included in this study. Thirty PICCs were exposed to a radiation field, and another 30 PICCs received radiation in a 3-cm homogeneity water equivalent phantom and then were irradiated. Each group was divided into three subgroups: 10 PICCs were given conventional fractionation, 2 Gy per fraction, 5 fractions per week; 10 PICCs were continuously given hypofractionation, 10 Gy per fraction, for 6 weeks; and 10 PICCs were given mock radiation as controls. The physical properties of these catheters were analyzed after radiation. None of the PICCs leaked under 300-kPa airflow pressure lasting 15 seconds. Fracture force values and liquid velocity values of all PICCs were within the normal range. The liquid velocity values of the control groups were higher than the two groups that received radiation ($P < 0.05$), and there was no difference between the two irradiation groups ($P > 0.05$). There were no statistical differences among the conventional fractionation group, hypofractionation group, and control group when compared to the fracture force values in two parts ($P > 0.05$). The physical property of PICC is quite stable with a clinically relevant dose of gamma radiation. It is likely that PICC can be used safely in patients receiving radiotherapy, although further in vivo and clinical studies are required.

Full Text

Reference:

Zhang, J., Zhang, S., Li, L., Xing, Y., Cao, M., Wu, J., Jiang, B. and Zhang, T. (2016) Effects of Ionizing Radiation on Physical Properties of Peripherally Inserted Central Catheter. PLoS



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