Radiation dose to neurological radiologist from cerebral angioplasty: A case report

Tanyawimol Somtom[1], Thanakorn Somboot[1], Panatsada Awikunprasert[1]
Sirikarn Kittichotwarat[2], Puttita Damchoo [2], Atithep Mongkolratnan [3], Tanapol Dachviriyakij[4]

[1] Department of Radiological Technology, Faculty of Medicine Vajira Hospital, Navamindradhiraj University
[2] Office of The Director, Faculty of Medicine Vajira Hospital, Navamindradhiraj University
[3] Department of Surgery, Faculty of Medicine Vajira Hospital, Navamindradhiraj University
[4] Ionising Radiation Metrology Group, Office of Atoms for Peace

Abstract

The neurological radiologist who performs cerebral angioplasty exposes to direct radiation and scattering radiation at various locations of the body. The accumulated radiation for a long time might have long-term effects, such as cataracts, leukemia and DNA changes that can develop into cancer. This research aims to measure the radiation dose to the neurological radiologist receives from performing cerebral angioplasty. OSL dosimeters were attached to the eyes, thyroid, wrists and legs of radiologist to measure the radiation dose of these organs. The results showed that fluoroscopy time was used up to 52 minutes for treatment in AMV cases. The minimum dose received was 0.01 mSv when a shield was used, and the maximum dose received was 0.29 mSv at the lens of left eye, followed by 0.24 mSv at the left leg when no shielding device was used. The measured data were then calculated to determine the number of cases per year that radiologists were able to perform the procedure. From the radiation dose limit, it was found that radiologists were able to treat up to 69 cases annually. In conclusion, the radiologist should be aware about radiation protection. The additional fluoroscopic time is resulting in increased radiation doses. Moreover, personal staff doses should be constantly checked, recorded, and monitored.

Keywords: cerebral angioplasty, optically stimulated luminescence, radiation dose