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Radiation Dosage to the Hands during Recanalization of Thrombosed Hemodialysis Grafts.

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PURPOSE: To quantify the radiation dosage to the hands during recanalization of thrombosed PTFE hemodialysis access grafts.

MATERIALS AND METHODS: Recanalization of 62 thrombosed hemodialysis access grafts was attempted in 54 patients (29 males, 25 females; ages 32-83 years). The procedures were performed by 5 staff interventional radiologists wearing finger thermoluminescence dosimeters on both hands for the entire procedure. Recanalization consisted of both pharmacologic and mechanical means. Data recorded included: patient demographics, location of graft, procedural success (defined as a complete dialysis run following recanalization) and contrast material amount. Regarding radiation fluoroscopic times, fluoroscopic magnification, angiographic data (total number of runs and frames), KvP, mA, and radiation dosage to each detector (right and left) were recorded.

RESULTS: There was a wide range of fluoroscopic times ranging from 3.8 to 41 minutes (mean = 12.5 minutes). The overall radiation dosage to both hands averaged 110 mREM. There was a significant ($p < 0.05$) difference between the right (5-440 mREM, mean 77.6) and left (5-300 mREM, mean 54) hands, including 1 left-hand dominant individual. There is also a significant difference for dosage among graft locations (upper limb grafts receiving lower doses versus chest/lower limb grafts) and among the five interventionalists (range lowest to highest). Successful recanalization of thrombosed hemodialysis access grafts occurred in 44 procedures (71%) and there were no immediate complications.

CONCLUSION: Hand dosage for recanalization of thrombosed hemodialysis access grafts is overall high and is significantly greater for the right hand. Significant variations occurred relative to graft location (non-upper limb) and were wide for different individuals. The dosage amount received during dialysis fistulolysis may have a bearing on the total yearly allowable radiation exposure to the extremities while performing all interventional procedures.