Purpose: After implementing a new total body irradiation (TBI) technique in clinic, in vivo dosimetry check is essential. We use a navel tool, radiophotoluminescent glass dosimeter (RPLGD), for in vivo dose measurement. It has superior physical and dosimetric characteristics than thermoluminescent dosimeter (TLD).

Method and Materials: Bilateral TBI is performed with the Siemens Prius Linac with a nominal energy of 6 MV photon beam. The patient is at the lying position and the source to midpoint of the patient is 415 cm. Water bags are used to compensate the change in body thickness and arms are positioned laterally at the mid AP-thickness level to block the lungs. In vivo dose measurements were performed with RPLGDs placed bilaterally at five levels to obtain the entrance dose and exit dose: on brain, chest, abdomen, thigh and lower legs. The midline dose is the average of entrance dose and exit dose. The prescribed dose is 120 cGy per fraction to the umbilicus to a total of 1200 cGy.

Results: The absolute dose measured on dose prescribed point is 123.6 cGy and the difference between the prescription and measurement is 3%. The dose at five different levels are normalized to that at the abdomen level. The relative doses of brain, chest, thigh and lower legs are 89%, 99%, 1.03% and 88% respectively. The absorbed doses at brain and lower leg levels may be overcompensated and these can be adjusted by modifying the thickness of water bags.

Conclusions: In our preliminary result, RPLGD is an ideal dosimeter to perform the in vivo dose measurement, not only the better physical and dosimetric characteristics but the easy process without annealing and the ability to be readout repeatedly. Conclusion, the RPLGD is a useful tool for in vivo dosimetry in clinic.