Purpose: To implement a clinical protocol for the use of scrotal shields for anal cancer IMRT treatment.

Methods and Results:
(1) Simulation
The patient is immobilized in a full-body alpha-cradle mold in the frog-leg position. Further, the mold is built up near the shield to provide a stable and reproducible setup. The planning CT images are taken in 2 sets with patient in the same position: first one with shield to capture the actual position and shape of the shield, and the second without shield for actual planning and dose calculation. These two image sets are then fused for treatment planning and DRR generation.

(2) IMRT planning
To avoid irradiation of the PTV through the shield, jaw sizes and collimator rotations are manually optimized for each beam. Each beam only covers a portion of the projected PTV while avoiding the shield. When it is favorable to cover the entire PTV from the anterior directions, zero fluence is enforced in the region where the field overlaps with the shield’s projection. In the inverse planning process, the shield structure is given a high priority as an avoidance structure so that the fluence through the shield is minimized. With the combination of these steps, the resulted IMRT has a highly conformal dose distribution with 95% of the target volume covered by the prescription dose and a global maximum dose of 112%.

(3) IGRT
Daily KV imaging ensures the proper alignment of the bony anatomy and the positioning of the shield, with the shield projected on the DRR. Day1 and weekly CBCT imaging further confirms soft tissue target alignment

Conclusions: A clinical procedure for using a scrotal shield in IMRT treatment of anal cancer is described in detailed steps from simulation and planning, to treatment verification and is demonstrated with a clinical patient case.

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none