Purpose: Recently our group developed a unified intensity-modulated arc therapy (UIMAT) technique which combines intensity-modulated radiation therapy (IMRT) and volume-modulated arc therapy (VMAT) optimization and delivery in a single arc. In this current study, we evaluated the potential benefit of UIMAT for the radiation therapy of complex head-and-neck cancers.

Method: A retrospective planning study was performed on 20 head-and-neck cases (13 treated clinically with VMAT and 7 with IMRT). These cases were re-planned using our UIMAT technique and the results were compared with the clinically delivered plans. Plans were assessed in terms of target coverage, target conformity, and sparing of organs at risk. The feasibility of plan delivery was verified with an ArcCheck phantom and a Varian TrueBeam linear accelerator operating in clinical mode.

Results: When compared with VMAT or IMRT alone, UIMAT plans maintained target coverage and conformity while significantly reducing the mean doses to organs at risk. In addition to a dosimetric advantage, UIMAT plans can be delivered with the same level of efficiency as VMAT.

Conclusion: Compared with IMRT or VMAT alone, UIMAT offers dosimetric advantages for the radiation therapy of head-and-neck cancers.