

**Purpose:** To investigate the clinical parameters involved in Syed interstitial HDR brachytherapy for patients with cervical carcinoma.

**Method and Materials:** Our institution uses 3-D image based treatment planning for all Syed Interstitial implants for advanced cervical carcinoma patients with known parametrical spread. Between 8/2009 and 10/2010, eight such patients were treated at our facility with Syed Interstitial HDR brachytherapy. The high risk CTV (HRCTV), intermediate risk CTV (IRCTV), and organs at risk (OAR: rectum, bladder, sigmoid, and small bowel) were contoured on the planning CT scan. All patients received 7 fractions of 4.2 Gy each in 4 days given bid prescribed to the HRCTV. Planning objectives included keeping doses to the OARs below 80% of prescription dose, to have D90 for the HRCTV greater than 90% of the prescription dose, and for V150 and V200 to be less than 50% and 20%, respectively. OARs were evaluated using doses to 2cc (D2cc). CT scan was performed each day.

**Results:** Between 18 and 21 needles were implanted but only 14 needles were used. Because of needle movements, an average of 2.4 plans were required. The average dose to 2cc (D2cc) of bladder was  $63\pm 5\%$  of the prescription dose (29.4 Gy). This value for the rectum was  $64\pm 3.4\%$ . The sigmoid and the small bowel D2cc values were generally all less than 40% of the prescription dose. The D90 for the HRCTV was on average 31.7 Gy, whereas the D90 for the IRCTV was on average 20 Gy. V150 and V200 were on average, 51% and 28%, respectively.

**Conclusion:** It is recommended that CT/MRI images be used for Syed interstitial HDR planning to adequately define the HRCTV, IRCTV, and OAR. The implanted needles always move during patient transfers to and from the HDR suite; thus, CT scans should be repeated daily.