Purpose: Complex interstitial implant using flexible catheters often introduces tight curvatures or kinks in the catheters. The purpose of this study is to utilize a force gauge to determine potential blockage in HDR catheters, thus helping to create optimal deliverable treatment plans and to avoid potential treatment emergencies.

Method and Materials: A VariSource iX HDR machine was used in this study. A compact digital force gauge from Wagner Instruments (Greenwich, CT) was used to measure the friction encountered in the catheters. A stainless steel telescoping-type tube, about 5 cm long when retracted, was used to guide the check wire while it is being pushed into the catheter.

A flexible catheter wrapped around a cylinder was used to find out the maximum push force of the VariSource HDR machine. The farthest position that the HDR machine’s check cable advanced before reporting a blockage was marked, and the force gauge was then used to push a check wire to the same position and the gauge’s reading was recorded.

Results: The maximum push force of the VariSource HDR machine as measured using the catheter-around-cylinder method was found to be about 1.4 lb. For a patient implant, once the problematic catheter(s) were identified during CT simulation, a treatment plan was developed using only unblocked catheters and reachable dwell positions.

Conclusions: By using a force gauge to identify potential blockage in catheters a priori, optimal HDR treatment plan is developed using only unblocked catheters and treatable dwell positions. This avoids the need for modifying the plan at the time of treatment and reduces potential treatment emergencies.