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**Purpose**
- To demonstrate the utility of ureteral stent placement during interstitial gynecological template brachytherapy.

**Introduction**
- It is possible to inadvertently injure the ureters (through trauma or high doses of radiation) during interstitial brachytherapy.
- Implantation of ureteral stents prior to insertion of brachytherapy catheters provides mechanical protection during the implant and allows image-based dose constraints to be used during computerized dosimetry.

**Implant Technique**
- Cystoscopy was used to place bilateral 5 French open ended (Pollack) ureteral stents (Figure 1).
- Retrograde pyelography confirmed stent placement.
- The distal end of the stents were inserted for drainage into the side of an 18 French Council catheter through tiny incisions 3-5 cm distal to the urethral meatus (Figure 2).
- They were secured by sliding them under a stainless steel washer and 1.0 silk suture ties (Figure 2).

**Materials and Methods**
- Stents were contoured on 5 patient’s planning CTs.
- 4 patients had cervical cancer (stages IB1, IIIB, IVB, IVB) and 1 had stage IIIA endometrial cancer.
- The HDR doses ranged from 15-36 Gy in 5-6 fractions.
- 3 separate treatment plans were generated to determine the impact of the stent placement on dosimetry.
- All plans were run using inverse planning simulated annealing.
  - Plan 1. A dose constraint of Dmax ≤120% of the prescription dose was placed on the ureters.
  - Plan 2. No dose constraints were placed on the ureters.
  - Plan 3. For this plan we re-draw the CTV assuming the course of the ureters was not visible (i.e. curve outs in the treatment contour were smoothed as shown in Figure 3 – blue vs. red contour).
- Dose volume histograms and virtual images were generated and doses to the ureters were compared (Figure 4 & Graph).

**Results**
- The graph shows the dose reductions achieved by contouring the ureters and placing dose constraints.
- The median decrease in Dmax on the most affected ureter was 59% (range 49-71%) for Plan 1 vs. Plan 2 and it was 138% (range 76-398%) for Plan 1 vs. Plan 3.

**Conclusions**
- The use of ureteral stents during interstitial gynecological brachytherapy reduces the risk of injury by providing mechanical support and reducing the dose to the ureters.