**Management of intraoperative ureteral injury and resection on a university gynecologic oncology service**

Objective(s): The purpose of this study was to describe the incidence, complications, outcomes and trends associated with ureteral surgeries performed on a gynecologic oncology service in the context of a fellowship training program over a period of 24 years.

Study Design: We conducted a retrospective cohort analysis of patients undergoing ureteral surgery by gynecologic oncologists participating in the training of fellows at either Moffitt Cancer Center or Tampa General Hospital from 1997 to 2020. Specifics regarding patient characteristics, factors predisposing to ureteral injury, location and type of injury, method of repair, involvement of surgical subspecialties, postoperative management and complications were abstracted from the medical record. Trends were evaluated by comparing the recent cohort (2005-2020) to our prior series (1997-2004).

Results: A total of 84 ureteral surgeries were identified for inclusion in this study. Overall, the average number of ureteral surgeries per year has decreased over time from 5.75 (1997-2004) to 2.38 (2005-2020). Of the 42 repairs of iatrogenic injury, 41 were recognized and repaired intraoperatively at the time of injury. The percentage of cases involving ureteral resections increased over time from 35% (16 of 46) to 68% (26 of 38) in the two cohorts, while the proportion of iatrogenic injuries decreased from 65% (30 of 46) to 32% (12 of 38). Transection was the most common type of injury (83% [35 of 42]) and the distal 5 cm of ureter was the most common location of injury (45% [19 of 42]). Ureteroneocystostomy was the most common method of repair (69 of 84, 82%). Postoperative management including ureteral stenting and postoperative imaging has not changed significantly, though length of urinary catheter usage decreased in the recent cohort without associated complications. Overall, there were 5 patients with major postoperative complications, 4 of which involved the urinary tract. Twenty-two patients had no postoperative complications and the most common complication was urinary tract infection (n=11). Of those with initial follow-up information, 62 of 65 ureteroneocystostomies and 9 of 12 ureteroureterostomies had radiologically normal urinary tracts. One patient had persistent ureteral obstruction following ureteroneocystostomy related to disease recurrence and 2 had anastomotic strictures following ureteroureterostomy. Of the 84 cases, 18 (21%) involved operativeurologic consultation, while the remainder were performed by gynecologic oncology alone. Complication rates did not vary significantly between cases with or without urology assistance.

Conclusions: Ureteral surgery is necessary in the case of injury or involvement with invasive gynecologic disease. There has been a decrease in number of procedures and proportion of injuries over time. Ureteroneocystostomy has remained the preferred method of reconstruction for both injury and resection with acceptable postoperative complication rates.