

Iatrogenic bladder and ureteral injury following gynecological or obstetric surgery

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Abstract #543

Introduction

Iatrogenic urinary tract injuries are potential complications of gynecologic and obstetric surgery due to the proximity to the female internal genitals (1). Early recognition of an injury is of great importance and has been associated with a more successful outcome. The aim of this descriptive study was to evaluate the management and outcome of iatrogenic bladder and ureteral injuries following gynecologic and obstetric surgery.

Methods and Materials

In total, 81 women were retrospectively identified using ICD-10 codes. Data were collected from medical records. Furthermore, a questionnaire on urinary tract symptoms and quality of life was sent to the women (The Danish Urogynecological Database) and included ICIQ-UI SF. Multiple linear regression adjusting for age, body mass index, prior abdominal/pelvic surgery, smoking history, and operation time was used to assess numerical outcomes and are presented as median ratios.

Results

In total, 55 women had a bladder injury, 23 women had a ureteral injury, and three women had both bladder and ureteral injuries. The women were divided into three subgroups: Benign (Group 1: N=37), cesarean section (Group 2: N=11), and malignant (Group 3: N=33).

Most bladder injuries were managed by a Vicryl 3.0 two-layer suture followed by transurethral catheter drainage for an average of 11.4 days (95% CI: 9.1 – 13.6).

Most ureteral injuries were managed by either neimplantation (7 (26.7%) followed by ureteral stenting in 38 days (95% CI: 22.0 – 54.0) and transurethral catheterization in 16.9 days (95% CI: 5.3 – 28.4), or by ureteral stenting for 46.7 days (15 (57.7%)) (95% CI: 31.5 – 61.2) and transurethral catheterization for 6.25 days (95% CI: 1.02 – 13.51).

In total, six women (7.4%) developed a fistula of whom one woman (16.7%) was in the benign group compared to five women (83.3%) in the malignant group. In addition, 32 women (39.5%) had a urinary tract infection, and six women (7.4%) had renal complications including hydronephrosis and dilatation of the proximal ureter.

Mean hospitalization in group 1 was 1.7 days (95% CI: 0.8 – 2.5) in women with a bladder injury and 2.7 days (95% CI: 0.6 – 4.8) in women with a ureteral injury, and overall, 14 (37.8%) women underwent reoperation.

In group 2, mean hospitalization was 6.7 days (95% CI: 1.4 – 12.1), and one woman (9.1%) underwent reoperation.

In group 3, mean hospitalization was 4.9 days (95%CI: 2.5 – 7.2) for those with a bladder injury and 10.8 days (95% CI: 4.7 – 16.8) for those with a ureteral injury. In group 3, ten women had a reoperation (30.3%), of whom three had a bladder injury and seven had a ureteral injury. A multiple linear regression model showed a statistically significant increased median length of urethral catheterization when duration of surgery increased.

Women undergoing cesarean group had a statistically significant longer median length of catheterization of 156% compared to the benign group.

Totally, 11 (20.8%) women reported urinary tract symptoms before the lesion compared to 28 (52.8%) following the injury.

In total, 19 (67.9%) women reported urge incontinence, 14 (50.0%) women in association with coughing and sneezing, and 9 (32.1%) reported in association with physical activity. Two women reported to have severer symptoms compared to prior to the injury. Regarding the lesions' impact on quality of life, most women did not report any impact, whereas three (5.6%) women reported very much.

Table 1. Management of bladder injury and ureteral injury including length of catheterization, length of hospitalization, and length of follow-up on women with a urinary tract injury.

	Group 1: Benign n = 37 (45.7 %)	Group 2: Cesarean section n = 11 (13.6 %)	Group 3: Malignant n = 33 (40.7 %)
Recognition, N (%)			
Intraoperative	25 (67.6)	11 (100)	27 (81.8)
Postoperative	12 (32.4)	0 (0)	6 (18.2)
Conferred with urologist (%)	18 (48.7)	8 (72.7)	22 (68.8)
Methylene blue, N (%)	14 (56.0)	9 (81.8)	14 (51.9)
Cystoscopy, N (%)	11 (44.0)	0 (0)	0 (0)
Length of bladder lesion (mm), mean (95 % CI)	16.7 (10.2 – 23.1)	40.6 (18.0 – 63.2)	21.8 (7.2 – 36.4)
Suture type for bladder lesion, N (%)			
Barbed suture (V-loc)	4 (10.8)	0 (0)	0 (0)
Vicryl	11 (29.7)	6 (54.6)	11 (33.3)
Monocryl	1 (2.7)	5 (45.5)	9 (27.3)
Other reabsorbable	3 (8.1)	0 (0)	1 (3.0)
Unknown	9 (24.3)	0 (0)	3 (9.1)
Suture size for bladder lesion, N (%)			
2.0	3 (11.1)	2 (18.2)	1 (4.8)
3.0	8 (29.6)	8 (72.7)	10 (47.6)
4.0	0 (0)	1 (9.1)	4 (19.1)
Unknown	16 (59.2)	0 (0)	6 (28.6)
Suture technique for bladder lesion, N (%)			
Interrupted	3 (11.1)	0 (0)	3 (15.0)
Continuous	3 (11.1)	7 (63.6)	8 (40.0)
Unknown	21 (77.8)	4 (36.4)	9 (45.0)
Layers of suture, N (%)			
1 layer	0 (0)	1 (9.1)	1 (5.0)
2 layers	15 (55.6)	8 (72.7)	12 (60.0)
Unknown	12 (44.4)	2 (18.2)	7 (35.0)
Neimplantation, N (%)	0 (0)	0 (0)	7 (21.2)
Nephrostomy, N (%)	2 (5.4)	0 (0)	2 (6.1)
Intraoperative stent, N (%)	10 (27.0)	1 (9.1)	16 (50.0)
Length of hospitalization (days), mean (95 % CI)			
Overall	1.9 (1.1 – 2.8)	6.7 (1.4 – 12.1)	8 (4.6 – 11.4)
Bladder injury	1.7 (0.8 – 2.5)	6.7 (1.4 – 12.1)	4.9 (2.5 – 7.2)
Ureteral injury	2.7 (0.6 – 4.8)	-	10.8 (8.7 – 17.3)
Length of catheterization (days), mean (95 % CI)			
Overall	7.9 (5.2 – 10.6)	14.6 (12.2 – 17.1)	13.0 (8.7 – 17.3)
Bladder injury	8.3 (5.6 – 11.1)	14.6 (12.2 – 17.1)	12.2 (6.3 – 21.3)
Ureteral injury	6.8 (-1.2 – 14.8)	-	13.8 (6.3 – 21.3)
Reoperation, N (%)	14 (37.8)	1 (9.1)	10 (30.3)
Bladder injury	4 (14.8)	1 (9.1)	3 (18.8)
Ureteral injury	10 (100)	-	7 (41.2)
Days until follow-up, mean (95 % CI)			
Overall	135.7 (73.6 – 197.8)	47.5 (7.7 – 87.4)	76.5 (38.9 – 114.1)
Bladder injury	79.3 (41.7 – 117.0)	47.5 (7.7 – 87.4)	40.6 (8.6 – 72.6)
Ureteral injury	288 (89.3 – 486.7)	-	110.2 (44.0 – 176.3)
Fistula formation, N (%)	1 (2.7)	0 (0)	5 (15.2)

CI = confidence interval

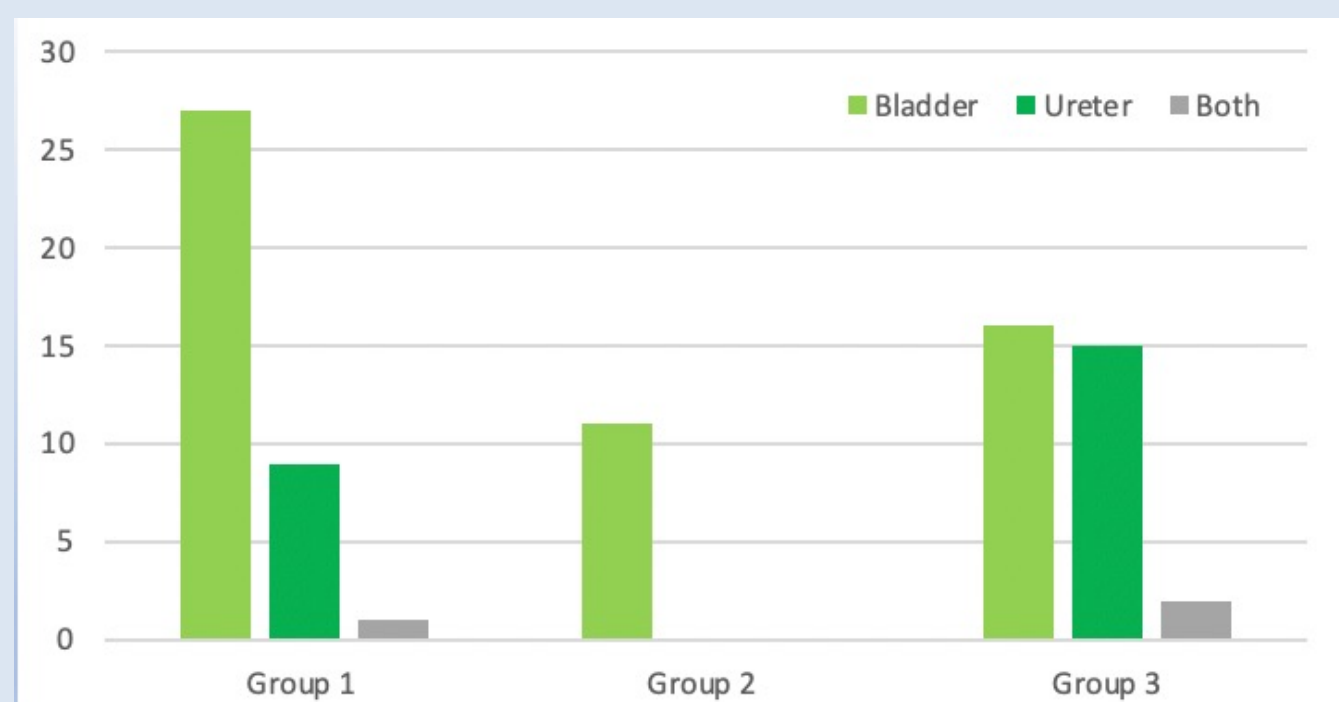


Figure 1. Distribution of injuries based on groups.

Interpretation of results

Our study suggests that two weeks of transurethral catheterization is sufficient for healing, but a shorter period may be sufficient. This specifically in the benign group, where only one woman developed a fistula. Furthermore, women undergoing cesarean section may not need this long period of catheterization.

Five women developed a fistula, suggesting that the ureteral stent should not be removed before six weeks, especially in case of malignancy. Finally, our study demonstrated high reoperation rate and fistula formation which are serious complications and should be kept in mind, when evaluating such patients postoperative.

In addition, most women reported that the iatrogenic urinary tract lesion did not influence on quality of life.

References

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