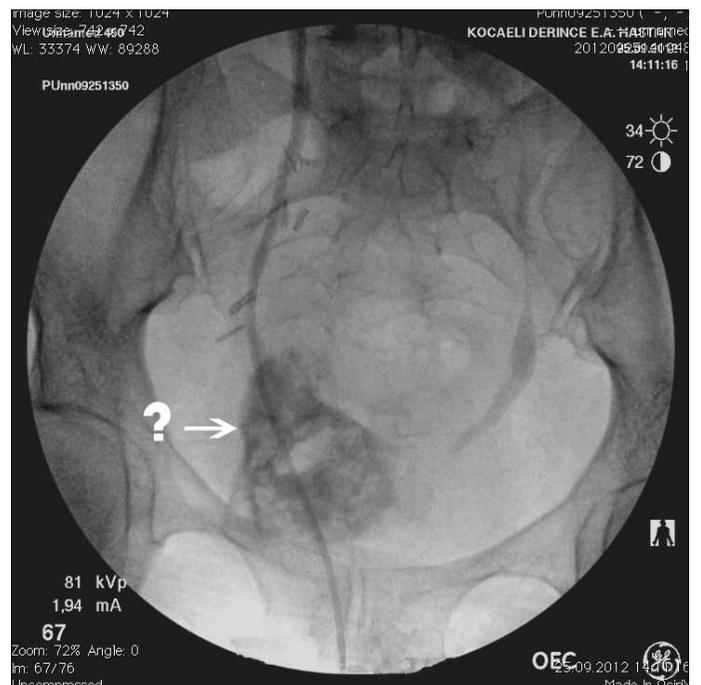
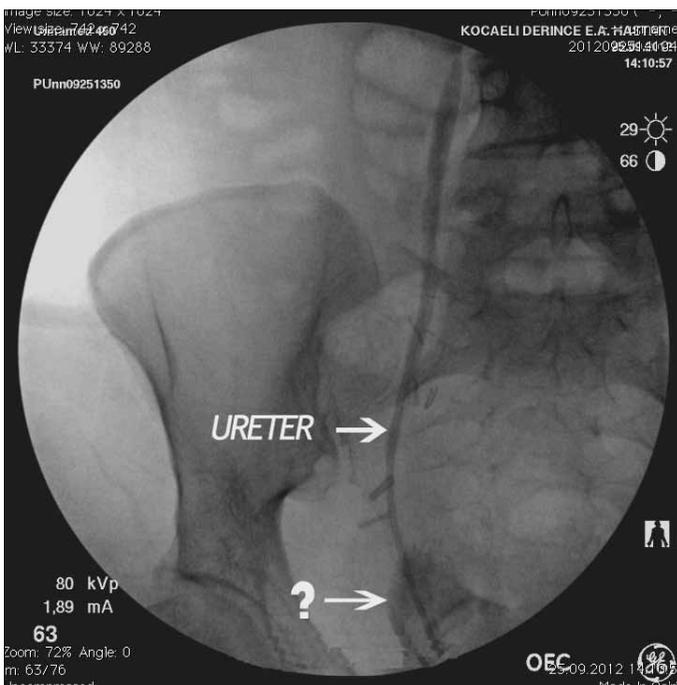
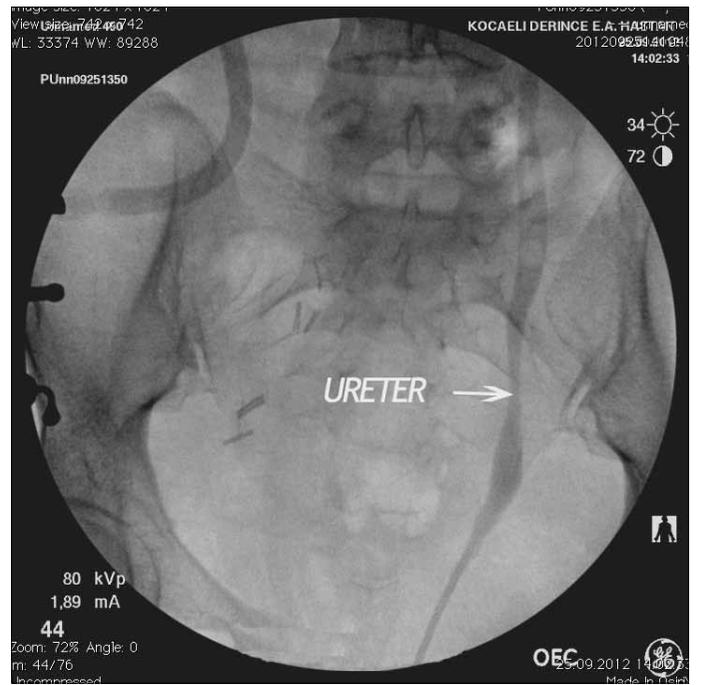
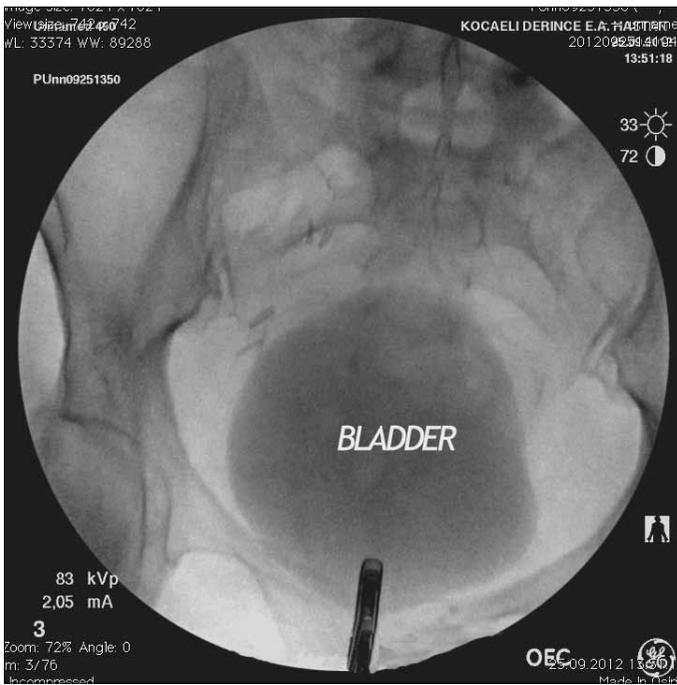


What is your diagnosis?



In laparoscopic hysterectomy procedures, typically the distal ureters are injured while ligation of the uterine arteries. Also dissection of the cardinal ligaments and division below the uterine vessels causes ureter injuries (1).

Such procedures are trouble some in the case of an abnormal anatomy. However preoperative intravenous pyelography (IVP) or other studies do not help to prevent these injuries (2).

Most of the patients are asymptomatic for a couple of days, however when an abdominal pain, a flank pain or a costovertebral angle tenderness exist this should alert the surgeon. Typically fistulization take place 3 days to 4 weeks if ureteral leak persists; the urine makes its way to the vaginal cuff (3).

In the case of vaginal leakage first step may be a double dye test for differential diagnosis of vesico-vaginal fistule (VVF) or uretero-vaginal fistule (UVF) (4, 5). Vagina is packed and intravenous methylene blue is administered, while intravesical carmine red instilled. Red stained vaginal pack indicates a VVF while blue indicates UVF. Next step is an IVU that may demonstrate hydronephrosis, location and severity of the leakage. If IVU is not helpful a retrograde ureterogram may be diagnostic and therapeutic at the same time with bypassing the fistulated segment of ureter. Also both MRI and multi-slice CT are valued imaging techniques for fistula detection (6).

Treatment options are internal drainage with ureteral double J (DJ) stent, external drainage with percutaneous nephrostomy, surgical repair, or even nephrectomy. If DJ stent bypass the fistula spontaneous healing is likely without a further surgical intervention (7). A close follow-up is mandatory, because of ureteral structuring seen in most cases.

If it is needed timing of surgical repair is controversial, either immediate or delayed ureteral repair are advised (8-10).

Depending on the location, degree and severity of the injury there are several surgical treatment options. Most of the cases successfully repaired with an ureteroneocystostomy further more uretero-ureterostomy, psoas hitch Boari flap, transureteroureterostomy techniques may be applied when it's indicated (9, 11).

Answer; patient who was diagnosed with early-stage cervical cancer ureterovaginal fistula which was developed after laparoscopic radical hysterectomy.

Hasan Terzi¹, Tayyar Alp Özkan², Ahmet Kale¹

¹Clinic of Gynecology and Obstetrics, Derince Training and Research Hospital, Kocaeli, Turkey

²Clinic of Urology, Derince Training and Research Hospital, Kocaeli, Turkey

References

1. Tamussino KF, Lang PF, Breinl E. Ureteral complications with operative gynecologic laparoscopy. *Am J Obstet Gynecol* 1998; 178: 967-70. [CrossRef]
2. Piscitelli JT, Simel DL, Addison WA. Who should have intravenous pyelograms before hysterectomy for benign disease? *Obstet Gynecol* 1987; 69: 541-5.
3. Loughlin KR. Complications of urologic surgery and practice: diagnosis, prevention, and management. New York: Informa Healthcare; 2007. p. xvi, 552 p.
4. O'Brien WM, Lynch JH. Simplification of double-dye test to diagnose various types of vaginal fistulas. *Urology* 1990; 36: 456. [CrossRef]
5. Raghavaiah NV. Double-dye test to diagnose various types of vaginal fistulas. *The J Urol* 1974; 112: 811-2.
6. Narayanan P, Nobbenhuis M, Reynolds KM, Sahdev A, Reznick RH, Rockall AG. Fistulas in malignant gynecologic disease: etiology, imaging, and management. *Radiographics* 2009; 29: 1073-83. [CrossRef]
7. Rajamaheswari N, Chhikara AB, Seethalakshmi K. Management of ureterovaginal fistulae: an audit. *Int Urogynecol J* 2012 Oct 24. [Epub ahead of print]
8. Badenoch DF, Tiptaft RC, Thakar DR, Fowler CG, Blandy JP. Early repair of accidental injury to the ureter or bladder following gynaecological surgery. *Br J Urol* 1987; 59: 516-8. [CrossRef]
9. Teber D, Egey A, Gozen AS, Rassweiler J. Ureteral injuries. Diagnostic and treatment algorithm. *Urologe A* 2005; 44: 870-7. [CrossRef]
10. Onuora VC, al-Mohalhal S, Youssef AM, Patil M. Iatrogenic urogenital fistulae. *Br J Urol* 1993; 71: 176-8. [CrossRef]
11. Selzman AA, Spirnak JP, Kursh ED. The changing management of ureterovaginal fistulas. *J Urol* 1995; 153: 626-8. [CrossRef]

ADVISORY BOARD OF THIS ISSUE (December 2012)

A. Akin Sivaslıoğlu	Emek Doger	Hüseyin Mete Tanır	Rukset Attar
Ahmet Gül	Emre Karasahin	Jing Liu	Salih Taşkın
Banu Dane	Enis Özkaya	Korhan Kahraman	Sefa Kelekci
Banu Kumbak Aygün	Eray Çalışkan	Kubilay Ertan	Sevtap Handemir Kılıç
Başar Tekin	Esra Esim Buyukbayrak	Levent Tütüncü	Tufan Öge
Begüm Yıldızhan	Esra Tonguc	Mehmet Tunc Canda	Yaprak Engin Üstün
Berna Haliloğlu	Gazi Yıldırım	Murat Ekin	Yılmaz Şahin
Çetin Çelik	Guler Sahin	Murat Özekinci	Yusuf Üstün
Ebru Çelik	Harika Bodur Öztürk	Mutlu Meydanlı	