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## Case report

# Forgotten stone in a ureteral stump increased the risk of an ureterocutaneous fistula

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## ABSTRACT

Here we report a female patient with diabetes who underwent right nephrectomy 18 years ago for pyonephrosis and renal stone formation. Before she was performed the right nephrectomy, a ureteral calculus impacted in the right ureteral stump was diagnosed. However, after 18 years, a right ureterocutaneous fistula was diagnosed, and the calculus was still found in the ureteral stump of the patient. As a result, a fistula caused by the ureter-impacted calculus was highly suspected. We successfully performed a right ureterectomy, fistulectomy, and debridement on the patient. From our experience in this case, we strongly recommend that a calculus impacted in the ureteral stump should be removed to prevent the occurrence of postoperative complications such as ureterocutaneous fistula.

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## 1. Introduction

A urocutaneous fistula is defined as abnormal communication between the urinary tract and the skin. It may arise from the kidney, ureter, bladder, or urethra. Renocutaneous fistulas may occur as a result of chronic infection, especially during the setting of a calculus disease.<sup>1</sup> In men, urethrocutaneous fistula mostly results from the complications of hypospadias repair or from the hypospadias itself. Vesicocutaneous and ureterocutaneous fistulas are mostly spontaneous or secondary to surgery and trauma. Here, we report the diagnosis of a ureterocutaneous fistula after a nephrectomy that was performed 18 years ago.

## 2. Case report

A 46-year-old female patient presented with a medical history of diabetes for more than 20 years and end-stage renal disease under hemodialysis for 8 years. Eighteen years before this admission, she had undergone a right nephrectomy because of severe pyonephrosis and renal stone formation. An impacted calculus within the upper third of the ureter was identified by preoperative computed tomography (CT) scan. A reno-colonic fistula was incidentally found during the operation. A general surgeon was consulted, and primary repair of the colon was performed. After being

discharged from our hospital, the upper-third stone was still noted on a kidney, ureter, and bladder (KUB) image during follow-up. This stone was not managed and was ignored. The patient was lost to follow-up 2 months later.

Recently, two swelling and painful masses near the previous operational wound (right subcostal region) were discovered by the patient herself (Fig. 1). Therefore, she visited the general surgery department of our hospital, and an incisional hernia resulting from the nephrectomy was assumed. However, the medial one was found to have a purulent discharge after admission. An abdominal CT scan revealed a ureterocutaneous fistula and stone impacted in the right ureteral stump (Fig. 2). The patient was therefore transferred to our urological service for an operation.

A fistulectomy, right ureterectomy, and debridement were successfully performed. Much pus within the fistula and upper ureter was identified and removed during the operation. The pus culture of the latter showed the presence of *Proteus mirabilis*. The stone which impacted the upper third of the ureter was identified from the pathological specimen (Fig. 3). The course of postoperative care was uneventful, and she was discharged from our hospital on postoperative day 10. The pathology report revealed abscess formation with a demarcated lesion composed of necrotic debris and a tract-like lesion connected to the skin compatible with the fistula.

## 3. Discussion

Ureterocutaneous fistulas are defined as abnormal communication between the ureter and skin. According to *Campbell-Walsh*

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**Fig. 1.** Fistula located in the right subcostal region near the middle axillary line (black arrow).



**Fig. 3.** Calculus impacted in the upper-third ureter immediately below the fistula.



**Fig. 2.** Calculus impacted within the right ureter near the ureteropelvic junction (white arrow).

*Urology* 9<sup>th</sup> edition, most ureterocutaneous fistulas are iatrogenic or otherwise purposefully surgically made to facilitate urinary drainage. Other uncommon causes include external penetrating trauma, malignant disease, and chronic infection. Rare causes such as aortic surgery with an infected aortic prosthesis were also reported.<sup>2</sup> A ureterocutaneous fistula after a nephrectomy is a very rare complication, and so far only a few cases have been reported.<sup>3–5</sup> A diagnosis can be made through fistulography that shows the communication between the skin and the ureteral stump, and through CT (as in this case). Management of such a fistula involves surgical excision, retrograde endoscopic injection

of fibrin glue,<sup>6</sup> urostomic exclusion using a covered Wallstent,<sup>7</sup> and saline rinse.<sup>4</sup> We chose surgical excision because of severe infection.

The pathogenesis in our case is very interesting. A foreign body of silk suture within the ureteral stump of a ureterocutaneous fistula was described in one report.<sup>3</sup> Eighteen years ago, one upper-third ureteral calculus was noted on a KUB image. Now an abdominal CT scan revealed an impacted upper-third ureteral calculus immediately below the fistulous orifice. We therefore concluded that the forgotten stone may have been the cause of the ureterocutaneous fistula, especially the infected stone in our case. Because of the above reasons, we suggest that an impacted stone, especially an infected stone, within the ureteral stump should be treated to prevent the occurrence of postoperative complications such as a ureterocutaneous fistula.

To our knowledge, this is the first case of a ureterocutaneous fistula secondary to urinary calculus occurring 18 years after a nephrectomy.

#### Conflicts of interest statement

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

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