

Case Report

External ureteral involvement as a result of ovarian cancer initially suspected as endometriosis leading to the diagnosis of squamous cell carcinoma

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Abstract: Ovarian squamous cell carcinoma [SCC] is a rare and aggressive malignancy that can mimic benign gynecological disorders, often leading to diagnostic delays and suboptimal management. Ureteral obstruction and subsequent hydronephrosis due to extrinsic compression are atypical initial presentations of ovarian SCC. A 39-year-old female presented with nausea, vomiting, anuria, and bilateral hydronephrosis, initially suspected to be endometriosis. Given the severity of acute kidney injury, emergent hemodialysis was initiated. Imaging demonstrated bilateral distal ureteral obstruction, necessitating percutaneous nephrostomy and subsequent referral for definitive management. Intraoperative findings revealed extensive fibrosis and adhesions, warranting left salpingo-oophorectomy and bilateral ureteroneocystostomy with double-J stent placement. Histopathological analysis confirmed ovarian SCC with direct ureteral invasion and hepatic metastases. Despite surgical intervention and palliative systemic therapy, the disease exhibited rapid progression, ultimately culminating in patient mortality. This case underscores the diagnostic complexities of ovarian SCC presenting with obstructive uropathy and highlights the necessity of maintaining a high index of suspicion for malignancy in patients with bilateral hydronephrosis of unclear etiology. A timely, multidisciplinary approach integrating urological and oncological expertise is paramount in optimizing clinical outcomes.

Keywords: Hydronephrosis, ovarian squamous cell carcinoma, ureteral obstruction, multidisciplinary management

Introduction

Hydronephrosis, defined as the dilation of the ureter and renal pelvis, is commonly attributed to urinary tract obstruction. The underlying etiologies range from benign conditions, such as nephrolithiasis and strictures, to malignant neoplasms causing extrinsic compression or direct invasion of the urinary system. If left untreated, severe bilateral obstruction can lead to progressive renal impairment and acute kidney injury [AKI], necessitating early diagnosis and intervention to prevent irreversible damage [1, 2, 11].

This case report describes a diagnostically challenging presentation of a 39-year-old female with bilateral hydronephrosis and

liver metastases, ultimately diagnosed with ovarian squamous cell carcinoma [SCC]. Initially presumed to have endometriosis, the diagnosis evolved following the detection of elevated creatinine levels and progressive obstructive uropathy, underscoring the importance of continuous reassessment in patients with complex clinical presentations [6].

Ovarian SCC is a rare and aggressive malignancy that frequently mimics benign gynecological conditions, such as endometriosis, leading to delayed diagnosis [6]. The extrinsic ureteral compression caused by ovarian SCC further complicates the clinical picture, often resulting in obstructive nephropathy that may go unrecognized in the absence of typical malignancy-associated symptoms [7, 13]. A meticulous



Figure 1. Pelvic CT scan demonstrating hydroureteronephrosis. *Description:* Preoperative CT scan showing the pressure effect on the ureters, contributing to bilateral hydroureteronephrosis.

diagnostic approach, integrating advanced imaging, histopathological evaluation, and multidisciplinary collaboration, is crucial for distinguishing between benign and malignant causes of ureteral obstruction.

Hydroureteronephrosis may result from various conditions, including congenital anomalies, neoplasms, and extrinsic compression due to retroperitoneal fibrosis or metastatic disease. When bilateral, it often indicates an extensive pathological process that requires urgent evaluation to preserve renal function and prevent complications [2, 12]. The initial misdiagnosis of endometriosis in this case highlights the diagnostic overlap between benign and malignant gynecological disorders, emphasizing the necessity of heightened clinical vigilance and comprehensive evaluation in similar presentations [7].

Case presentation

Patient information

A 39-year-old female presented with uremic syndrome, characterized by nausea, vomiting, anuria, and a critically elevated serum creatinine level [~ 10 mg/dL]. Given the severity of acute kidney injury [AKI], the patient underwent emergent hemodialysis, which temporarily stabilized her renal function. Subsequent ultrasonography revealed severe bilateral hydroureteronephrosis, prompting further evaluation (**Figure 1**).

Due to the critical nature of the findings, the patient was transferred to a specialized urology

center for further assessment. Cystoscopic examination revealed bilateral distal ureteral obstruction, raising suspicion of an intrinsic or extrinsic ureteral pathology. The initial differential diagnosis included endometriosis-associated ureteral obstruction, a known cause of ureteral strictures in premenopausal women. To relieve the obstruction, a bilateral percutaneous nephrostomy was performed, and the patient was referred for further gynecological evaluation.

Gynecological assessment did not indicate an immediate need for intervention, and the patient was subsequently referred to our center under the supervision of Dr. Kazemi for further evaluation. A contrast-enhanced CT scan, focusing on the obstructive uropathy, did not initially reveal hepatic metastases. Given the progressive nature of bilateral ureteral involvement, the patient was scheduled for surgical ureteral reimplantation.

Intraoperative findings and surgical management

During exploratory surgery, extensive fibrosis and dense adhesions were identified, findings suggestive of endometriosis-related tissue involvement. Due to the severity of ureteral compression and the dense nature of the adhesions, the surgical team proceeded with a left salpingo-oophorectomy. Given the uncertainty regarding the patient's marital status, only the left ovary and fallopian tube were resected. Additionally, bilateral ureteroneocystostomy was performed with double-J stent placement to restore urinary drainage and prevent recurrent obstruction. Tissue samples were obtained from the distal ureters for histopathological evaluation.

Postoperative course and histopathological diagnosis

Histopathological examination confirmed a diagnosis of moderately differentiated squamous cell carcinoma [SCC] of the left ovary with direct ureteral invasion. Subsequent oncological workup revealed hepatic metastases, which had been previously undetectable on initial imaging. Despite multimodal management, including surgical intervention and palliative chemotherapy, the patient's condition deteriorated progressively, ultimately culminating in multi-organ failure and mortality.

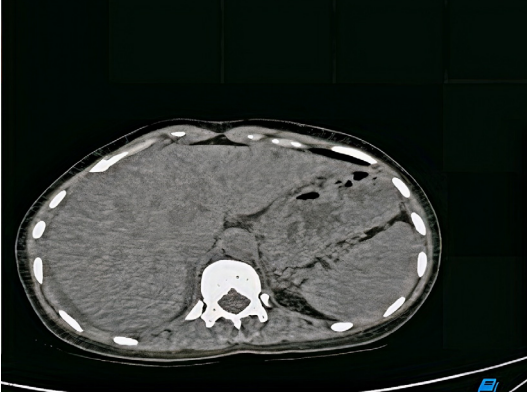


Figure 2. CT scan showing hypodense liver lesions consistent with metastatic involvement. *Description:* CT scan highlighting hypodense liver lesions, which are indicative of metastatic spread.

Clinical findings

Imaging studies, including ultrasound and CT scans, have revealed a hypodense lesion in the liver along with hydronephrosis, moderate on the right side, and severe on the left side [3] (**Figure 2**). The patient had previously undergone a left oophorectomy, which further complicates the clinical picture. Imaging findings prompted surgical intervention, leading to the placement of bilateral double-J stents to address ureteral obstruction [5].

Ultrasound findings were crucial in identifying dilation of the ureters and renal pelvis, consistent with obstructive uropathy. Subsequent CT urography revealed a hypodense liver lesion and confirmed severe hydronephrosis on the left side, suggesting a high likelihood of ureteral obstruction due to a malignant process. These findings set the stage for a multidisciplinary management approach that includes both surgical and oncological intervention.

The imaging results, along with clinical signs, play a key role in determining the treatment strategy, which includes the decision to place nephrostomies, perform ureteral reimplantation, and manage potential malignancy-related complications.

Diagnostic assessment

To evaluate the cause of hydronephrosis. Initial ultrasound confirmed bilateral dilation of the ureters and renal pelvis, which was

consistent with obstructive uropathy. Given the severity of the findings, further evaluation with CT urography revealed a hypodense lesion in the liver and severe hydronephrosis, particularly on the left side, suggesting a high likelihood of malignancy-related ureteral obstruction [3].

In addition to imaging, biopsy was performed to confirm the underlying cause of the obstruction. Pathological analysis revealed moderately differentiated squamous cell carcinoma [SCC] in the left ovary with metastasis to the liver [6]. The confirmation of malignancy was further supported by tumor marker testing, with P63 showing strong positivity in the tumor cells, consistent with SCC [7].

The comprehensive approach, involving a combination of imaging and pathology, enabled the timely identification of both renal obstruction and underlying malignancy. This allowed the medical team to initiate appropriate interventions aimed at relieving the obstruction and managing the oncological aspects of the disease.

Therapeutic interventions

The patient underwent a complex surgical procedure that included bilateral ureteroneocystostomy using the modified Lich-Gregoir technique, bilateral double-J stent placement, and a left salpingo-oophorectomy. The primary goals were to alleviate urinary obstruction, prevent further renal damage, and address oncological concerns by removing the left ovary and fallopian tube affected by SCC. The procedure lasted 3.5 hours and was completed with minimal intraoperative blood loss [4, 5].

Double-J stents were left in place postoperatively to maintain ureteral patency and to prevent recurrent obstruction (**Figure 3**). Renal function was closely monitored, and follow-up imaging revealed an improvement in the degree of hydronephrosis. The stents were removed after 70 days, once renal function had stabilized [5].

Despite successful surgical intervention to relieve the urinary obstruction, the patient's overall condition deteriorated because of metastatic SCC progression. Palliative chemotherapy was administered to manage the liver metas-



Figure 3. Postoperative X-ray with ureteral stent placement. *Description:* An X-ray showing the placement of a ureteral stent following nephrostomy to relieve ureteral obstruction.

tasis and slow disease progression. However, despite these interventions, the patient's condition continued to worsen, ultimately leading to death from the metastatic cancer [9].

Postoperative care

After bilateral placement of double-J stents and ureteral reimplantation, the patient showed a marked improvement in renal function. The creatinine levels, which had been critically elevated, decreased to approximately 0.9 mg/dL, indicating successful alleviation of the urinary obstruction. Postoperative management focused on monitoring the patient's recovery and ensuring the effectiveness of surgical interventions [9, 10].

Regular monitoring of renal function and electrolyte levels was performed to assess the recovery of kidney function and to detect any potential complications early. Follow-up imaging studies were scheduled to ensure patency of the urinary tract and the effectiveness of stent placement. A multidisciplinary team including urology, nephrology, and oncology specialists coordinated closely to provide compre-

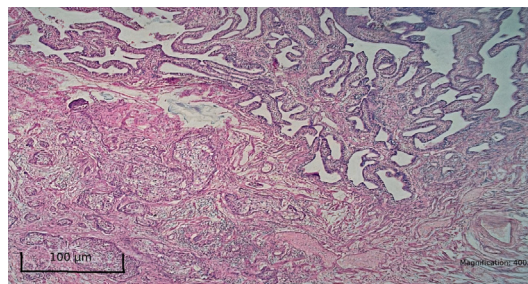


Figure 4. Histopathological slide showing tubal involvement by tumoral cells, consistent with moderately differentiated squamous cell carcinoma [SCC]. *Description:* A histopathological slide highlighting the involvement of fallopian tubes by tumoral cells, indicating moderately differentiated SCC.

hensive care and support throughout the postoperative period.

Pathological findings

A 4 cm moderately differentiated SCC was observed in the left ovary and fallopian tube surface [pT1c2] (**Figure 5**).

Tumor markers showed P63 strongly positive in tumoral cells, whereas PAX8, NAPSIN, and CD30 were negative [7] (**Figures 4, 6, 7**).

Follow-up and outcomes

Seventy days postoperatively, bilateral double-J stents were removed using ureteroscopy. The initial reduction in creatinine levels to approximately 0.9 mg/dL postoperatively suggested a temporary improvement in renal function. Despite this early positive response, the patient's condition eventually deteriorated and, required palliative chemotherapy. Following chemotherapy, the creatinine level increased again, necessitating another nephrostomy. Unfortunately, the patient's overall condition continued to worsen, ultimately leading to multi-organ failure, and she eventually died due to the disease.

Discussion

Management of urological and oncological complications

The management of patients presenting with concurrent urological and oncological complications is inherently challenging, particularly when malignancy-induced obstructive uropathy is involved. In this case, the patient developed

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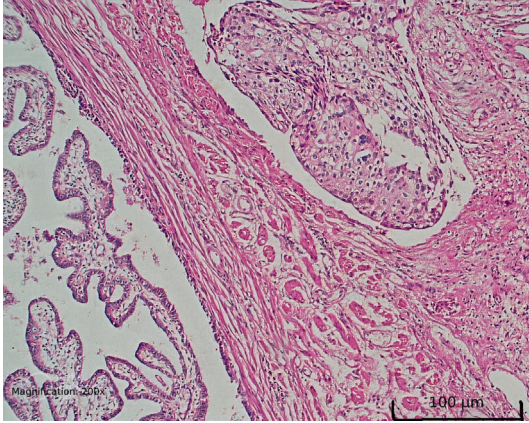


Figure 5. Pathological section of ovarian tissue showing malignant squamous cells. *Description:* Pathological examination of ovarian tissue demonstrating the presence of malignant squamous cells consistent with squamous cell carcinoma.

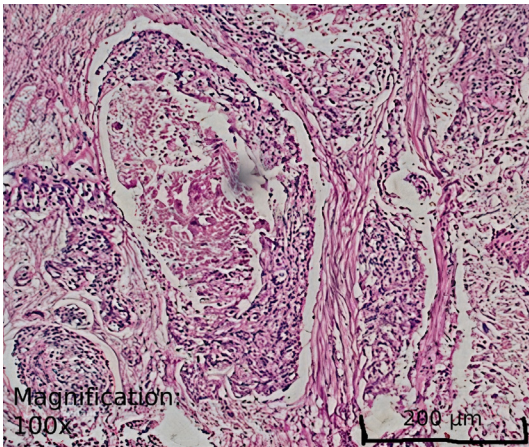


Figure 6. Histopathological slide showing the ovarian mass with squamous cell carcinoma [SCC], highlighting the cellular architecture and differentiation of the tumor. *Description:* Histopathological slide of the ovarian mass showing squamous cell carcinoma, with emphasis on cellular architecture and tumor differentiation.

bilateral hydronephrosis, a condition that, if left untreated, can lead to progressive renal failure. The diagnostic complexity was further heightened by the presence of ovarian squamous cell carcinoma [SCC], an exceedingly rare malignancy with aggressive behavior and delayed recognition.

Mechanisms of ureteral compression

In this case, external ureteral compression was caused by a pelvic mass exerting extrinsic pres-

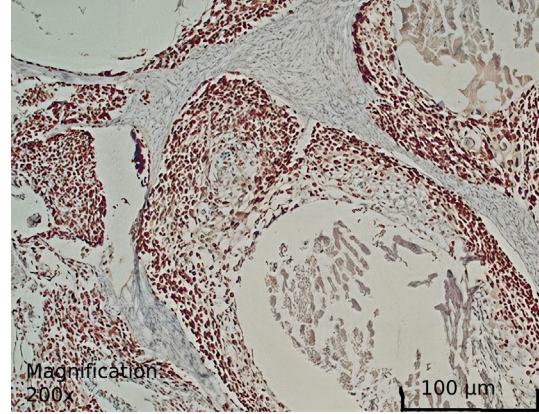


Figure 7. Pathological section showing tumoral invasion of the fallopian tube. *Description:* A slide showing tumoral invasion of the fallopian tube, indicative of aggressive squamous cell carcinoma involvement.

sure on the ureters, leading to progressive obstruction. Additionally, fibrosis and inflammatory changes contributed to retroperitoneal involvement, further exacerbating ureteral narrowing. Imaging findings demonstrated medial displacement of the ureters, a hallmark of extramural ureteral stenosis [10, 13].

Hydronephrosis can result from benign or malignant conditions, with treatment decisions dependent on the degree of obstruction and overall prognosis. In this patient, bilateral ureteroneocystostomy with double-J stent placement was performed to alleviate obstruction and preserve renal function. The modified Lich-Gregoir technique, widely used for ureteral reimplantation, is well-documented for its efficacy in minimizing postoperative stricture formation [4]. The successful execution of the procedure with minimal blood loss and a short operative time highlights the viability of this approach in carefully selected cases.

Differentiation of ureteral stenosis types

Ureteral stenosis is classified into intramural and extramural types, with distinct pathophysiological characteristics [10]: Intramural stenosis arises from pathologies within the ureteral wall, such as calculi, intrinsic tumors, or fibrosis. These cases often present with flank pain, hematuria, or progressive obstructive uropathy. Extramural stenosis, as observed in this case, results from external compression due to an adjacent mass. Common causes include retroperitoneal fibrosis, metastatic tumors, or gynec-

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colonic malignancies, leading to ureteral displacement and obstruction.

Advanced imaging techniques are essential in differentiating these conditions. While intramural obstructions appear as luminal irregularities on contrast-enhanced studies, extramural compression typically presents with smooth medial displacement of the ureters without an intraluminal mass [12]. In this case, CT urography findings were consistent with extramural ureteral involvement, necessitating surgical decompression.

Early diagnosis and management of hydronephrosis

Early detection of hydronephrosis is critical for preventing irreversible renal dysfunction. This case underscores the importance of routine surveillance in patients with risk factors for urinary obstruction, particularly those with non-specific symptoms such as progressive renal impairment. The unexpected elevation in serum creatinine levels warranted further imaging, ultimately leading to the identification of malignancy-induced obstruction [9, 11].

While nephrostomy placement is effective for short-term relief, it is not a curative approach. In this patient, bilateral nephrostomy tubes were placed due to the severity of obstruction, with a subsequent transition to surgical reimplantation following histopathologic confirmation of malignancy [2]. This underscores the necessity of a stepwise approach, balancing temporary urinary diversion with definitive surgical management.

The decision to proceed with left salpingo-oophorectomy was based on oncologic considerations, given the invasive nature of ovarian SCC. This malignancy is often diagnosed at an advanced stage, as observed in this case. Despite aggressive surgical intervention and palliative chemotherapy, the prognosis remained poor, primarily due to hepatic metastases at initial presentation [6, 7]. This case emphasizes the urgent need for earlier detection strategies, as conventional therapies demonstrate limited efficacy in advanced disease.

Initial diagnostic impressions and reevaluation

The initial misdiagnosis of endometriosis was due to overlapping clinical features, including

pelvic pain and fibrosis-associated adhesions. However, the unexpected rise in creatinine levels prompted further investigation, ultimately leading to the correct diagnosis of ovarian SCC. This highlights the critical role of continuous diagnostic vigilance, particularly in cases where the clinical progression deviates from the expected course [10].

A key challenge in this case was the balance between renal preservation and oncologic disease control. While ureteral reimplantation effectively relieved the obstruction, the patient's long-term prognosis remained guarded due to the aggressive nature of SCC and its resistance to conventional chemotherapy [9]. The development of targeted therapies and novel early detection techniques remains a priority in improving outcomes for rare and aggressive gynecologic malignancies [7].

The role of tumor markers was instrumental in guiding the diagnostic process. P63 positivity in tumor cells confirmed squamous differentiation, while negative expression of PAX8, NAPSIN, and CD30 helped exclude other histopathologic differentials [7]. This case underscores the importance of molecular diagnostics in accurate histopathological classification, allowing for more individualized treatment planning.

Finally, this case highlights the necessity of a multidisciplinary approach, integrating urologists, oncologists, nephrologists, and pathologists to ensure optimal patient outcomes [8]. Although the prognosis was ultimately poor, timely intervention provided temporary relief from obstructive uropathy, contributing to an improved quality of life during the disease course.

Prognostic implications and future directions

The prognosis of patients with ovarian SCC, particularly in the presence of metastatic disease, remains poor. Although surgical intervention provided temporary relief from the renal obstruction, the aggressive nature of the tumor significantly affected patient survival. Conventional chemotherapy has limited efficacy in such cases, which underscores the need for novel treatment approaches. Emerging therapies, such as targeted therapies and immunotherapies, hold promise in improving the outcomes of patients with SCC by addressing the

underlying molecular pathways involved in tumor growth and progression. Early detection using advanced imaging techniques and tumor markers, such as P63, is also critical for improving patient outcomes. Future research should focus on the development of more effective treatments for ovarian SCC as well as strategies for early diagnosis and prevention.

Literature review and context

This case aligns with previous findings regarding the challenges of diagnosing and managing patients with ovarian SCC. Studies have shown that ovarian SCC, although rare, is highly aggressive and typically diagnosed at an advanced stage with a high propensity for metastasis [7]. The occurrence of hydronephrosis in this case further complicated the clinical picture as urgent surgical intervention was required to prevent renal failure. The use of ureteroneocystostomy with double-J stent placement is supported by the existing literature as an effective method for resolving ureteral obstruction in the setting of malignancy [4, 5].

However, the literature also highlights the limitations of conventional chemotherapy for treating ovarian SCC, as observed in our patient's poor response to chemotherapy. This emphasizes the need for future studies to explore alternative treatment strategies such as personalized medicine, targeted therapies, and immunotherapy, which could offer more effective solutions for managing aggressive cancers.

Limitations

This case report had several limitations. First, the rarity of ovarian squamous cell carcinoma limits the generalizability of our findings. Second, the patient's medical history and presence of multiple comorbidities complicate the interpretation of the outcomes. Additionally, the inability to perform certain diagnostic procedures due to the patient's critical condition may have restricted a more comprehensive evaluation. Finally, the short follow-up period limits the assessment of long-term outcomes and effectiveness of therapeutic interventions. Future studies with larger cohorts and longer follow-up periods are necessary to provide more robust data and validate these findings.

Conclusion

This case highlights the complexities involved in managing bilateral hydronephrosis secondary to metastatic ovarian squamous cell carcinoma [SCC]. The patient's clinical presentation initially mimicked benign gynecological conditions, leading to a diagnostic delay. The progression to acute kidney injury [AKI] due to obstructive uropathy necessitated a multidisciplinary approach, integrating urological, gynecological, and oncological expertise. Advanced imaging and histopathological evaluation played a critical role in establishing the diagnosis and guiding surgical and palliative interventions.

Despite aggressive management, the presence of hepatic metastases at diagnosis significantly impacted prognosis. This case underscores the importance of early detection, as ovarian SCC is often diagnosed at an advanced stage with limited therapeutic options. The integration of molecular diagnostics, such as P63 tumor marker analysis, can enhance diagnostic accuracy and therapeutic decision-making in rare gynecologic malignancies.

Given the poor response of ovarian SCC to conventional chemotherapy, further research into targeted therapies and immunotherapeutic approaches is warranted. This case reinforces the critical role of a multidisciplinary strategy in optimizing outcomes and highlights the need for heightened clinical suspicion in patients presenting with bilateral ureteral obstruction of unclear etiology.

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Disclosure of conflict of interest

None.

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