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Laparoscopic Ureterolysis for Retroperitoneal Fibrosis in a Young Female

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Abstract

Background: Retroperitoneal fibrosis (RPF) is a rare condition characterized by fibroinflammatory tissue that can encase abdominal structures, most notably the ureters, leading to ureteral obstruction. The diagnosis is confirmed on imaging studies like CT or MRI due to the non-specific nature of symptoms. Surgical intervention, such as ureterolysis, is typically required when ureteral obstruction occurs. *Case Report*: We present the case of a 26-year-old female who was diagnosed with bilateral RPF following complaints of bilateral flank pain. She had previously undergone bilateral DJ stenting. MRI confirmed RPF with involvement of both the mid and lower ureters. A two-stage laparoscopic ureterolysis was performed due to dense desmoplastic reaction and ureteral medialization. A novel surgical technique was employed, where the ureter was mobilized anterior to the colon, with tacking sutures securing the colon to the peritoneal fold to prevent recurrence. Post-operative recovery was uneventful. *Conclusion*: This case demonstrates the successful use of a staged laparoscopic ureterolysis for bilateral RPF in a young female, with a novel surgical approach aimed at reducing the risk of recurrence. While long-term follow-up is essential, this technique may offer a valuable addition to the surgical management of RPF with ureteral involvement.

Keywords: Hydronephrosis, MRI, Renal Failure, Stents, Ureter.

Introduction

Retroperitoneal fibrosis (RPF) is a rare disorder characterized by the proliferation of fibroinflammatory tissue in the retroperitoneum, which can encase structures such as the ureters and other abdominal organs, including the inferior vena cava. Idiopathic RPF (IRPF) constitutes approximately two-thirds of cases, while the remaining third are attributed to secondary causes, including medications, infections, neoplasms, radiotherapy, surgery, and malignancies [1,2]. This fibrotic process can lead to significant complications, particularly ureteral obstruction, resulting in hydronephrosis and subsequent renal dysfunction if not managed promptly.

The estimated incidence of RPF varies between 1 in 200,000 to 500,000 individuals annually [3,4]. Though the exact etiology remains unclear, the association of RPF with other connective tissue diseases and occasional familial clustering suggests a possible genetic predisposition [5]. Diagnosis can be challenging due to the non-specific nature of the presenting symptoms, which often include flank pain, back pain, or non-specific abdominal discomfort. Advanced imaging modalities like CT and MRI play a critical role in assessing the extent of the disease and guiding management.

In this case report, we present the case report of a 26-year-old female diagnosed with bilateral RPF. She underwent successful laparoscopic ureterolysis, with a staged approach to address the dense desmoplastic reaction encasing both ureters. The case also demonstrates the importance of long-term follow-up to prevent recurrence and monitor renal function.

Case Report

A 26-year-old female presented with bilateral flank pain and features of bilateral pyelonephritis. She had undergone bilateral DJ stenting at an outside hospital in February 2022. An MRI scan from March 2022 indicated retroperitoneal fibrosis (RPF) involving the mid and lower ureters bilaterally. Upon presenting to our outpatient department in March 2022, the patient was asymptomatic, with normal vital parameters and an unremarkable abdominal examination. There were no palpable masses or flank tenderness, and the rest of the systemic examination was normal. Blood investigations, including complete blood count (CBC) and renal function tests (RFTs), were within normal limits. The MRI was reviewed and confirmed the diagnosis of RPF.

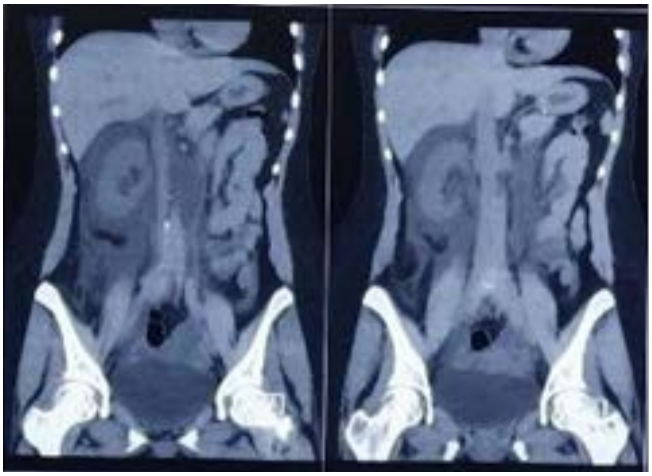

Fig.1: *MRI showing retroperitoneal fibrosis.*

A bilateral retrograde pyelogram (RGP) was performed, which showed medialization of both ureters and narrowing at the L5-S1 level. Based on these findings, it was decided to proceed with ureterolysis, starting with the left side. During the left ureterolysis, the ureter was difficult to identify due to a dense desmoplastic reaction. The left ureter was successfully mobilized anterior to the colon, with tacking sutures taken on the colon with the peritoneal fold. The post-operative period was uneventful, and the patient was discharged on post-operative day three. Due to the dense fibrosis, the procedure was staged, and right ureterolysis was performed three months later. The right-side procedure was similar to the left, and bilateral DJ stents were removed two months after the right ureterolysis.

The patient underwent regular follow-up with complete blood count, renal function tests, and ultrasound of the kidneys, ureters, and bladder (USG KUB) at 3 and 6-months post-surgery. All results were normal, with no evidence of hydroureteronephrosis. At the one-year follow-up in October 2023, repeat blood tests and USG KUB also showed normal findings.

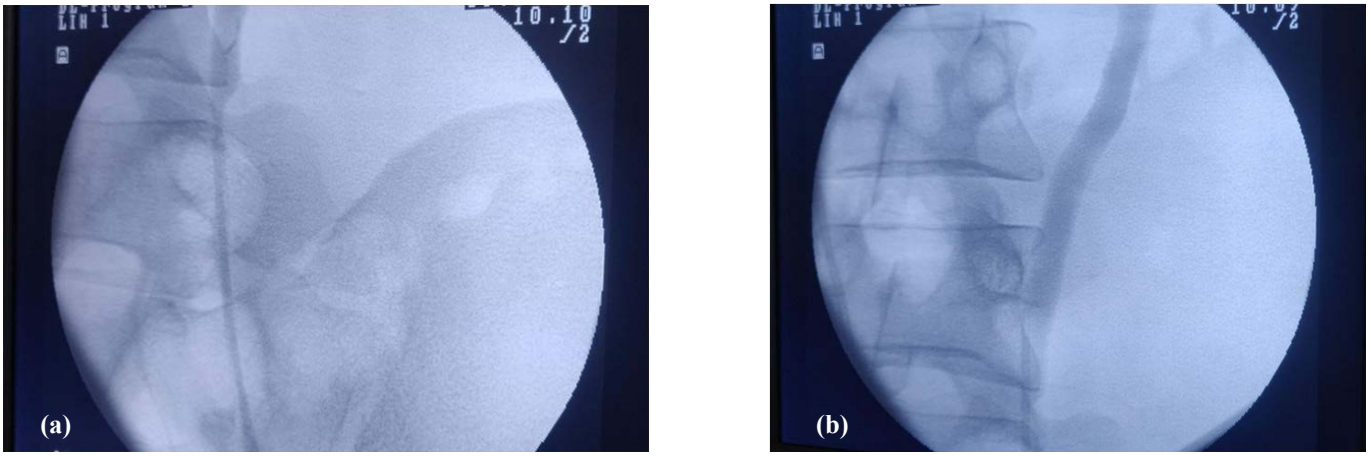

Fig.2 (a): *Left ureteric orifice cannulated with ureteric catheter; RGP shows medialization and mid-ureter narrowing due to ureteral encasement from RPF;* **(b):** *Left RGP reveals proximal hydroureteronephrosis.*

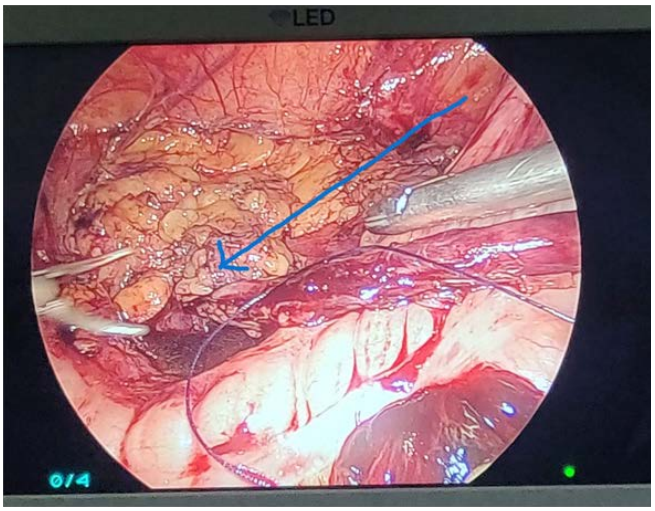

Fig.3: *Dense ureteric adhesions due to fibrosis – difficult ureterolysis.*

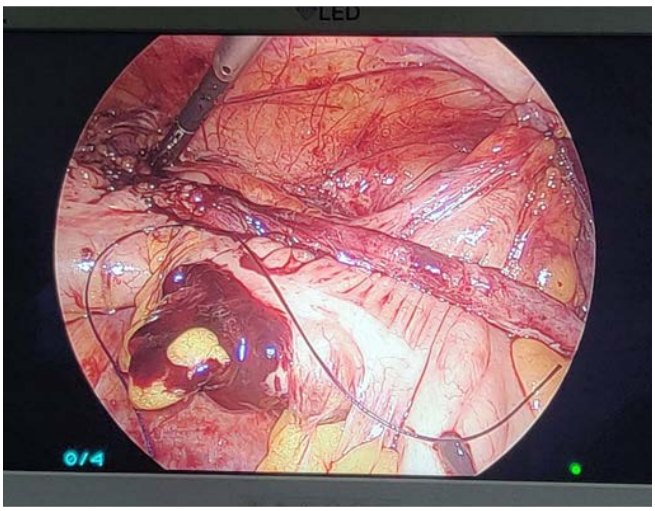

Fig.4: *Lap ureterolysis done – ureter mobilised anterior to the colon and colon tacked to lateral peritoneal fold.*

Discussion

Retroperitoneal fibrosis (RPF) is a rare disorder, often idiopathic, characterized by the development of fibrotic tissue in the retroperitoneum, which can encase and obstruct structures like the ureters. The exact mechanism is not well understood, but ceroid, a lipid-protein complex found in atherosclerotic plaques, has been proposed as a potential antigen that triggers the inflammatory response, leading to fibrosis [6,7]. Although RPF typically affects males in their 40s to 60s, the patient in this case report a 26-year-old female represents a less common demographic for the disease [8].

The challenge in managing RPF lies in its non-specific symptoms and its potential to cause complications like ureteral obstruction. While early symptoms such as back or abdominal pain are common, more severe outcomes like renal failure arise if the ureters are obstructed. Diagnosis is heavily reliant on imaging, with CT or MRI providing a clear view of the extent of fibrotic involvement and organ encasement. In our case, MRI confirmed bilateral RPF with ureteral involvement, necessitating surgical intervention. The decision to proceed with laparoscopic ureterolysis was based on the extent of ureteral narrowing and medial displacement. The procedure posed significant challenges due to the dense desmoplastic reaction, which made it difficult to identify and mobilize the ureters. However, utilizing the DJ stents placed earlier, we were able to successfully perform ureterolysis. The unique aspect of our surgical approach involved mobilizing the ureters anterior to the colon and using tacking sutures to secure the colon to the peritoneal fold, a method not widely described in the literature. This technique may help prevent recurrence by minimizing the chance of re-encasement of the ureters by fibrotic tissue.

While glucocorticoids are commonly used in treating RPF, we opted for surgical management in this young female to avoid the long-term side effects associated with steroids. Our decision aligns with current practices in cases where the primary concern is mechanical ureteral obstruction rather than systemic inflammation.

Conclusion

This case illustrates the successful use of laparoscopic ureterolysis in a young female with bilateral retroperitoneal fibrosis. Despite the technical difficulties posed by dense fibrosis, we

were able to achieve satisfactory outcomes using a staged surgical approach and a novel technique involving ureteral mobilization and tacking sutures to prevent recurrence. Long-term follow-up is essential to monitor for any recurrence of fibrosis and ensure the maintenance of renal function. Our innovative surgical method could serve as a useful addition to the existing strategies for managing ureteral involvement in RPF, although further studies and long-term data are required to validate its effectiveness.

Contributors: IM: manuscript writing, patient management; AI: manuscript editing, patient management; HP: critical inputs into the manuscript. IM will act as a study guarantor. All authors approved the final version of this manuscript and are responsible for all aspects of this study.
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