

## Introduction

Chyluria is a rare medical condition in which chyle, a lymphatic fluid with a milky appearance, enters the urinary tract.

In developing countries, chyluria is mostly secondary to lymphatic stasis or obstruction caused by parasitic roundworms of the genera *Wuchereria*, *Brugia* and *Onchocerca*. Chyluria in the Western world is often caused by tuberculosis, pregnancy, infection or iatrogenic due to surgical trauma. [1][2]

Chyluria will often resolve spontaneously but persisting chyluria can cause nutritional deficiency and immunosuppression.

## Case Report

A 67 year old, asymptomatic patient presented at the follow-up consultation 4 years after partial nephrectomy by lumbotomy for a pT1 clear-cell renal carcinoma, Fuhrmann grade 2.

Follow-up CT scan of the abdomen and thorax showed no signs of tumor recurrence or metastasis but showed an intravesical fatty substance, suggestive for chyluria. Blood work was normal and showed a normal renal function and no signs of immunosuppression, hypoalbuminemia or hypolipidemia.



Figure 1 and 2: intravesical fatty substance, very suggestive for chyluria,

A conservative management consisting of a high-protein diet with addition of medium-chain triglycerides was enhanced with disappearance of the chyluria after 6 months.

## Discussion

Iatrogenic chyluria after partial nephrectomy is rare and only reported in a few case reports. A high amount of lymphatics surround the renal capsula and surgical trauma can create fistulas between the lymphatic vessels and the urinary tract. These fistulas give proteins, lipids and other large molecules access to the urinary tract and can cause hypoalbuminemia, hypoproteinemia, hypolipidemia or immunosuppression. [1, 2]

Partial nephrectomy is the standard operative procedure for treating small renal cell carcinomas in order to preserve maximal renal function. Chyluria after radical nephrectomy has not been reported in medical literature. [4] [5] A history of milky urinary appearance is very suggestive but chyluria is mostly asymptomatic and often only diagnosed during oncologic follow-up imaging. Chyluria can be detected on CT-scan when contrast agent is present in the perinephric space or when intravesical fatty substance is diagnosed. [2]

An urinary chyle test using the Sudan stain method can be used if in doubt.

A conservative approach is preferred in mild cases of chyluria.[6] Conservative therapy includes a high-protein-diet, restriction of long-chain fatty acids, additional medium-chain fatty acids and sufficient amount of fluid. [7] A successful conservative approach with resolution of the chyluria was performed in our patient.

Sclerotherapy of the lymphatic vessels is recommended when chyluria persists after 12 months or when malnutrition or immunosuppression occurs.

Sclerosant agents like silver nitrate, N-butyl-2-cyanoacrylate [8], povidone iodine and some contrast agents like potassium bromide have shown to be effective in treating chyluria. Sclerotherapy using silver nitrate has a success rate of 96,5% after three installations and a recurrence rate of 31.7%. [8] Side effect of silver nitrate sclerotherapy include flank pain, nausea, vomiting, interstitial nephritis, chemical cystitis, papillary necrosis, arterial hemorrhage and pelvicalyceal cast formation. In addition, physicians should be careful when using silver nitrate as there has been cases reported in which silver nitrate caused acute renal failure followed by formation of long ureteric stricture and even decease. [9] These side effect has not been reported when using povidone iodine installation while povidone iodine has similar efficacy (98%) and recurrence rates (22%) as silver nitrate showing that povidone iodine proves to be a safe and effective alternative for silver nitrate installation. Dextrose 50% has a poor success ratio (5%) and should therefore not be used as an sclerosant agent. [9]

Surgical interventions are required in patients with severe anemia, weight loss, hypoalbuminemia and failure of sclerotherapy. Surgery includes nephrolympholysis, ureterolympholysis, hilar vessel stripping and fasciectomy to obtain a complete disconnection of perirenal lymphatic tissue from the urinary tract. Laparoscopic interventions have several advantages compared to open surgery like shorter hospital stay, better visualisation of the lymphatic vessels, less blood-loss and rapid recovery. Tang et al described a modified technique of renal pedicle lymphatic disconnection in 15 patients which does not require complete disconnection of perirenal fat tissue and fasciectomy, reducing the possibility of nephropoptosis. [10]

## Conclusions

Chyluria after partial nephrectomy is a rare complications which needs close surveillance due to the risk of malnutrition and immunosuppression. A conservative treatment consisting of a high-protein diet and addition of medium-chain triglycerides can be performed in asymptomatic patients but a more invasive treatment is recommend when nutritional deficiency or immunosuppression occurs. Sclerosant agents can be used as first-line therapy, followed by surgical therapy after failure of the sclerosant agents or in case of severe malnutrition or immunosuppression.

## Bibliography

1. Parthasarathy, S., F.H. Miller, and D.D. Casalino, Chyluria. *J Urol*, 2012. 187(5): p. 1856-7.
2. Miller, F.H., et al., CT diagnosis of chyluria after partial nephrectomy. *AJR Am J Roentgenol*, 2007. 188(1): p. W25-8.
3. Ghahremani, G.G., Editorial Comment to chyluria after partial nephrectomy: a rare but considerable complication. *Int J Urol*, 2013. 20(2): p. 245-6.
4. Goyal, N.K., et al., Factors affecting response to medical management in patients of filarial chyluria: A prospective study. *Indian J Urol*, 2014. 30(1): p. 23-7.
5. Tuck, J., I. Pearce, and M. Pantelides, Chyluria after radical nephrectomy treated with N-butyl-2-cyanoacrylate. *J Urol*, 2000. 164(3 Pt 1): p. 778-9.
6. Dhabalia, J.V., et al., Silver nitrate sclerotherapy for chyluria: evaluation for the optimal instillation regime. *Urol Int*, 2010. 85(1): p. 56-9.
7. Dalela, D., et al., Silver nitrate sclerotherapy for 'clinically significant' chyluria: a prospective evaluation of duration of therapy. *Urol Int*, 2004. 72(4): p. 335-40.
8. Garg, M., D. Dalela, and A. Goel, Devastating complication of silver nitrate instillation for the treatment of chyluria. *BMJ Case Rep*, 2013. 2013.
9. Goel, S., et al., Is povidone iodine an alternative to silver nitrate for renal pelvic instillation sclerotherapy in chyluria? *BJU Int*, 2004. 94(7): p. 1082-5.
10. Tang, L., et al., Modified technique of renal pedicle lymphatic disconnection for chyluria through the laparoscopic surgery. *Int J Clin Exp Med*, 2014. 7(9): p. 2916-20.