

Milk of Calcium in a Pyelocalyceal Diverticula-Endoscopic Management and Review of Literature

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Abstract

Milk of Calcium (MOC) refers to a colloidal suspension of calcium salts. The occurrence is rare and it has been reported to occur most commonly in pyelocalyceal diverticula of Kidneys. Cases of MOC in gall bladder and breast has also been reported. MOC has distinct features on X-Ray, Ultrasonography and Computed Tomogram (CT). The MOC cysts of kidneys are frequently mistaken for renal stones on X-rays and could arise suspicion of a complex renal cyst on CT. In this report, we describe the endoscopic management (Flexible Ureteroscopy with laser) of a case of MOC in a pyelocalyceal diverticulum, presenting with loin pain, with its review of literature.

Keywords: Milk of calcium; Renal cysts; Milk of calcium cysts; Calyceal diverticula

Introduction

Milk of Calcium (MOC) refers to a colloidal suspension of calcium salts. The occurrence is rare and it has been reported to occur most commonly in pyelocalyceal diverticula of Kidneys. Cases of MOC in gall bladder and breast has also been reported. MOC has distinct features on X-Ray, Ultrasonography and Computed Tomogram (CT). The MOC cysts of kidneys are frequently mistaken for renal stones on X-rays and could arise suspicion of a complex renal cyst on CT. In this report, we describe the endoscopic management (Flexible Ureteroscopy with laser) of a case of MOC in a pyelocalyceal diverticulum, presenting with loin pain, with its review of literature.

Case Report

29 year old lady, with no comorbidities, presented with intermittent right sided renal colic of one year duration. Her biochemical and hematological investigations were within normal limits. Ultrasonogram was done which showed 1.5 cm right interpolar region cyst with calcification. Contrast Enhanced CT was done, which revealed tiny right renal calculi and a 1.6 cm middle calyceal diverticulum with characteristic calcium and fluid interface with layering, in addition to a few small calculi with the cyst. Patient underwent a flexible ureteroscopy, a middle pelvicalyceal diverticulum with a narrow isthmus was present, closed by a thin web. Web was incised, mouth widened and cyst marsupialised using Holmium LASER (20 Watt Lumenis VersaPulse PowerSuite p20). The diverticulum was found to have calcium coagulum with numerous minute calculi. The contents were washed out completely and a Double J stent was placed in the collecting system. Patient became symptom free and stent was removed after two weeks.

Review of Literature

Pyelocalyceal diverticula also known as calyceal diverticula (CD) or pericalyceal cysts, refers to a congenital cavity in kidney parenchyma

lined by nonsecretory urothelium communicating with calyx [1]. It was first described by Ralen in 1841. It proposed that, occurrence of a CD is because of failure of degeneration of the third or fourth division of ureteral buds of the Wolffian Duct [2-4].

CD do not usually cause any symptoms, they measure less than 1 cm in diameter and incidentally found on an Intra Venous Pyelogram. Pyelocalyceal diverticula may be associated with urinary tract infections, renal calculi, flank pain, pyuria, micro and macroscopic hematuria, and hypertension. They can present as a renal mass and sometimes may contain MOC [5,6].

MOC in renal cysts was first described by Ludin and Howald in 1940. The initial radiological descriptions were made in 1948, by Holm and demonstrated layering in such cysts [7].

The content of the MOC is a viscous colloidal material consisting of calcium carbonate, calcium phosphate, calcium oxalate and sometimes ammonium phosphate [8]. The presentation can be varied. Commonly patient presents with MOC in a calyceal diverticulum or occasionally patient can present with MOC in dilated calyces in a hydronephrotic kidney [9].

Obstruction and repeated inflammation seem to play a key role in development of MOC, the exact cause is not known. [10,11]. Obstruction and stagnation of urine leads to super-saturation of calcium salts and formation of microliths of calcium [9].

The decision on the type of intervention is crucial in cases of MOC cysts, as many do not require treatment. The modalities that have been attempted for managing are PCNL [12] and ESWLs [11,12].

X-Ray can give a clue about the MOC cyst. Erect or lateral decubitus film may show a half moon shaped calcification that changes with patients position. A calcified MOC cyst might not show this finding, however [13]. It can be easily mistaken for renal calculus.

The incidence of finding a pelicalyceal diverticula is 2.1-4.5 per 1000 Intra Venous Urogram (IVU) examinations. Their appearance in IVU depends on whether there is a patent communication with the collecting system as most calyceal diverticula tend to opacify better in delayed films [6]. On Ultrasonography, gravity dependent acoustic

shadows may be seen, which helps differentiate it from a renal stone or a neoplasm [13].

A non - contrast CT scan can reveal the layering in the MOC cyst and the characteristic changes with change in position [6]. Other pathologies like calculi, tumors, cysts of kidneys can be made out using CT.

MRI has been reported to be very sensitive in the diagnosis of MOC cysts. The appearance on MRI is said to be pathognomonic. Calcium emits a weak signal with the remainder of the cyst gives an intense signal on the T1 and T2 weighted images, and demonstrates layering of calcium (Figures 1 and 2).

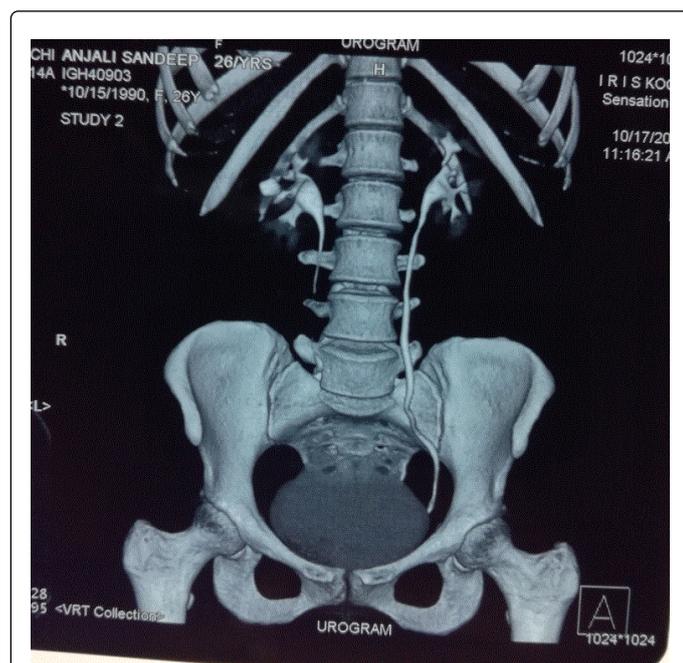


Figure 1: Demonstrates layering of calcium 1.

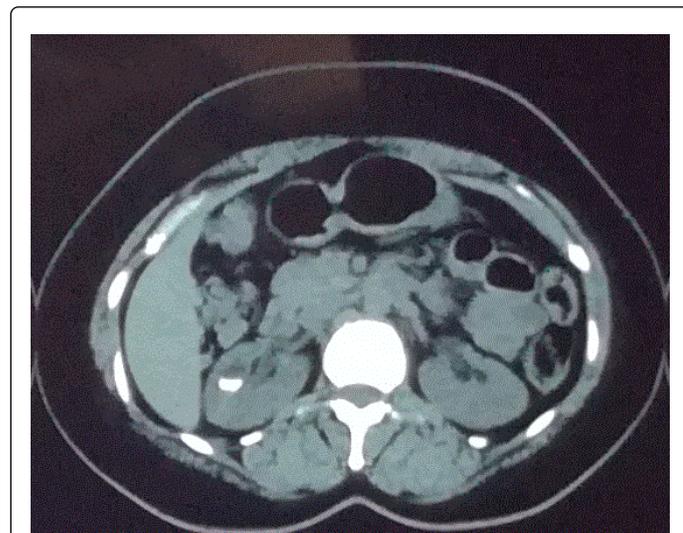


Figure 2: Demonstrates layering of calcium 2.

Calyceal diverticula are usually asymptomatic and do not warrant any treatment. There is a probability of it becoming symptomatic or getting complicated (infections, stone formation, MOC) which might require surgical intervention. The various surgical options available are PCNL, ESWL, Endoscopic manipulations, nephrectomy, hemi or partial nephrectomy (Figures 3 and 4).

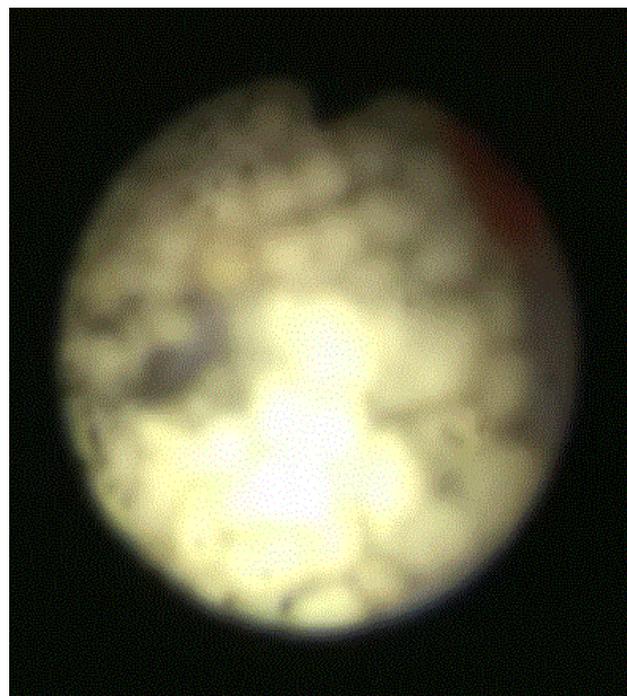


Figure 3: Endoscopic manipulations, hemi nephrectomy.

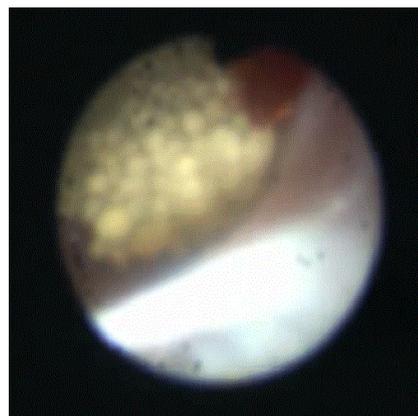


Figure 4: Endoscopic manipulations, partial nephrectomy.

Conclusion

MOC Cysts should be kept in mind when dealing with non-classical radio opacities in the kidney and before initiating treatment. Radiological investigations aid in clinching the diagnosis, and management should be tailored for the patient based on the

symptomatology as most people do not require intervention of any sort. Minimally invasive endoscopic techniques can be used for treatment, like in our case, if indicated.

References

1. Rayer PP (1870) *Treatments of Kidney Diseases* 3: 507.
2. Middleton AW, Pfister RC (1974) Stone-containing pyelocaliceal diverticulum: embryogenic, anatomic, radiologic and clinical characteristics. *J Urol* 111:2-6.
3. Estrada CR, Datta S, Schneck FX, Bauer SB, et al. (2009) Caliceal diverticula in children: Natural history and management. *J Urol* 181: 1306-1311.
4. Stunell H, McNeill G, Browne RF, Grainger R, Torreggiani WC (2010) The imaging appearances of calyceal diverticula complicated by urolithiasis. *Br J Radiol* 83: 888-894.
5. Wulfsohn MA (1980) Pyelocaliceal diverticula. *J Urol* 123: 1-8.
6. Gayer G, Apter S, Heyman Z, Morag B (1998) Pyelocalyceal diverticula containing milk of calcium--CT diagnosis. *Clinical Radiology* 53: 369-371.
7. Holm H (1948) On pyelogenic renal cyst. *ACTA* 29: 87-89.
8. Wulfsohn MA (1980) Pyelocaliceal diverticula. *J Urol* 123: 1-8.
9. McCorkell SJ, Hefty TR, Dowling AD (1985) Bilateral milk-of-calcium urine and hydronephrosis. *J Urol* 133: 77-78.
10. Kikuchi E, Sumitomo M, Hatakeyama N, et al. (1998) Percutaneous endoscopic marsupialization of a pyelocalyceal diverticulum with milk of calcium stones. *Urol Int* 60: 62-65.
11. Biyani CS, Bhatia V (1992) Renal milk of calcium--a new contraindication to extracorporeal shock wave lithotripsy? *Br J Urol* 70: 447-448.
12. Vandeursen H, Baert L (1990) An intrarenal opacity resisting extracorporeal shock wave lithotripsy. *J Urol* 144: 961-962.
13. Langer W, Theiss M, Hofmockel G, Frohmüller H (1996) Atypical findings in a patient with a renal milk-of-calcium cyst. *Urology* 48: 135-138.