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Management of chronic urinary retention in glanular penile calciphylaxis

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ABSTRACT

Urinary retention in penile calciphylaxis is a rare phenomenon due to its association with end-stage renal failure.

A 48 year-old male was noted to have a lesion with necrotic appearances overlying his urethral meatus with increasing bladder volumes. He is on haemodialysis for end-stage renal failure and was being treated for infected calciphylaxis ulcers on his thigh.

The current literature provides little guidance on managing urinary retention in this cohort of patients.

We recommend that ultrasound-guided aspiration of the bladder should be performed in patients with glanular penile calciphylaxis who develop urinary retention as it offers a high safety profile.

1. Introduction

Calciphylaxis-related ulcers are strongly associated with end stage renal disease and typically occur across the trunk and limbs. Involvement of the penile glans is unusual[1] and the development of urinary retention is these patients is rarer still due to the poor renal function with minimal urine output.

Patients with calciphylaxis have limited physiological reserves[2] and are at higher risk of developing complications from catheter-associated urinary tract infections [UTIs]. In our literature review, two patients underwent suprapubic catheterisation for urinary retention with meatal obstruction, however their outcomes were not well-documented.[1,3]

2. Case presentation

We present the case of a 48-year-old male who was referred to urology by the renal physicians as possible Fournier's gangrene due to a necrotic lesion on his glans penis. The patient was on broad spectrum antibiotics for sepsis attributed to an infected calciphylaxis-related ulcer on his thigh. Despite no suprapubic pain and clinical anuria, he had incidentally been noted to have increasing bladder volumes on bedside ultrasound scanning, with UTI posited as an alternative source of sepsis. Prior to admission, he described his voiding pattern as having infrequent episodes of urinary incontinence.

His past medical history included end-stage renal failure [ESRF], transitioning from peritoneal dialysis to haemodialysis four months previously, after developing calciphylaxis. Other co-morbidities included type 2 diabetes and previous cerebrovascular accident due to atrial fibrillation (AF).

On examination, the patient had a palpable bladder and a tender necrotic lesion over his glans tip involving the urethral meatus (Fig. 1). An ultrasound scan two weeks prior had shown 400mls of urine inside his bladder with no hydronephrosis. At the time of review, a bladder scan showed 600mls.

After consideration, ultrasound guided aspiration of his bladder was performed in the first instance due to the poor prognosis associated with the presentation of calciphylaxis and very slow increase in bladder volumes. This was performed in the ultrasound department without complication. We did not omit his apixaban for the procedure as it would have increased his risk of developing a stroke. Thereafter, he continued his medical treatment for infected ulcers.

After the initial ultrasound guided aspiration of his bladder, our patient had a protracted admission due to slow resolution of his infected ulcer and physical deconditioning. He underwent a further aspiration of his bladder three months after the initial intervention which drained 1300 mL of urine. The lesion on his glans remained stable at 3 months (Fig. 2) and at 5 months (Fig. 3) following the initial review. He has not voided any urine urethrally since and has been discharged to a nursing home due to his increasing physical care needs.

Due to our patient's co-morbidities and the very slow production of urine, we felt that urinary diversion via an indwelling suprapubic catheter posed a significant risk of complications, particularly UTIs and blockages, and he is anticipated to require aspiration less frequently than he would routine catheter changes. We will review him again in four months.

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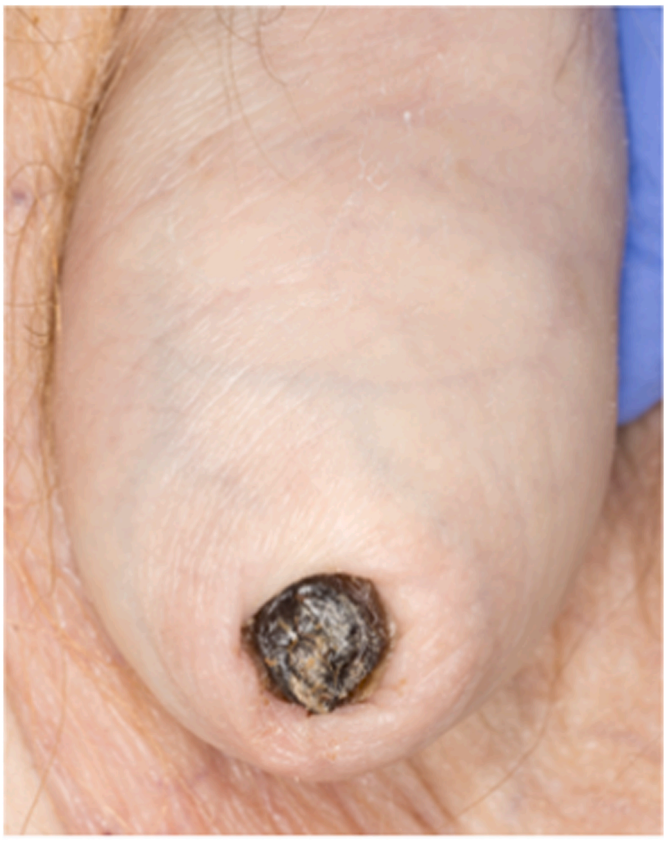

Fig. 1. Penile shaft oedema with necrotic lesion over the distal glans.

Fig. 2. Minimal progression 3 months later.

3. Discussion

Calciphylaxis is a complication of ESRF that classically presents with painful necrotic lesions, usually distributed across the lower limbs or abdomen, but also reported to affect the penis and bowel.[1] The disease process involves progressive occlusion of blood vessels due to calcification of the tunica media resulting in infarction. Risk factors include ESRF, hyperphosphataemia, hypercalcaemia, hyperparathyroidism, vitamin K deficiency and diabetes mellitus.[4] The diagnosis of calciphylaxis carries a poor prognosis with a yearly mortality of 70%.[2]

Fig. 3. Stable appearance 5 months later.

Although the gold standard for diagnosis is punch biopsy, it is recommended to routinely avoid this due to the risk of progression to wet gangrene.[2,4] Therefore, in the majority of cases, histopathology is performed with samples from debridement or penectomy, typically showing features of necrosis with calcification within the vascular walls, and thrombosis formation.[4] Radiological investigations, including ultrasound, CT and MRI, have also been suggested in diagnosing and management planning for penile calciphylaxis.[3]

Medical management comprises of wound care and analgesia, alongside infection prevention and treatment. Regulation of serum vitamin D, calcium and phosphate via diet modification and the use of calcium and phosphate chelating agents (as well as Cinacalcet in hyperparathyroidism) has been recommended.[4] In particular, sodium thiosulfate alongside haemodialysis has been shown to improve mortality through its mechanism of chelating calcium.[2,4]

Surgical intervention for penile calciphylaxis can be considered in patients with intractable pain, unresolving infection and progressive gangrene.[3] Options include debridement, partial penectomy and total penectomy with urinary diversion. A parathyroidectomy may be considered in patients with hyperparathyroidism with poor response to cinacalcet.[4]

Urinary retention is a rare development in the context of penile calciphylaxis primarily due to its association with dialysis-dependent renal failure. In our literature review, only three out of forty cases mentioned the presence of retention with meatal obstruction. Two patients underwent suprapubic catheter insertion to divert urine but outcomes were poorly recorded with only one mentioning patient satisfaction.[1,3] Patients without retention who underwent surgical debridement were routinely managed with temporary urethral catheters and those undergoing total penectomy had perineal urethrostomy formation.[2]

In cases of painless retention (as in this case), the risk of nosocomial, catheter-associated UTI is important to consider, particularly in the

context of patients who are not dependent on their urinary tract for maintenance of renal function and the occurrence of UTIs in up to a quarter of acute admissions requiring catheterisation. The risks of catheterisation routinely are recognised as outweighing the benefits, and suprapubic catheterisation is no less a risk than urethral catheterisation.[5] Sepsis due to UTI carries a 25–60% mortality risk, with catheterisation a particular risk factor in the intensive care setting. In this context, aspiration on a triannual basis offers a relatively low risk management option for the obstructed urinary tract.

4. Conclusion

Calciphylaxis is a diagnosis associated with a life expectancy of less than one year. The population with calciphylaxis have reduced physiological reserves, and sepsis secondary to catheter associated UTI is therefore more likely to prove fatal. In cases where urinary retention is present, routine interval sterile ultrasound guided aspiration should be considered a safer method of bladder management.

Consent

Full informed patient consent was obtained prior to the submission of this report.

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Author contributions

Syed Rahman: Writing – original draft; Writing – review & editing.

Neil Harvey: Conceptualisation; Funding acquisition; Supervision; Writing – review & editing.

Katie Moore: Writing – review & editing.

Declaration of competing interest

The authors are employees of the organisation that has provided funding for the case report. There are no other conflicts of interest.

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