CASE REPORT

Metastatic Calcinosis Cutis Penis and Scrotum with Preserved Erectile Function Post Surgery in an ESRD Patient on Hemodialysis with Secondary Hyperparathyroidism

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Metastatic calcinosis cutis of the penis and scrotum seen in a patient with End Stage Renal Disease (ESRD) on hemodialysis is a case not usually encounter in urology clinics. Review of the available literature mostly showed compromised erectile function of patients with metastatic calcinosis cutis of the penis. Presented is a case of a patient with ESRD on hemodialysis for five years who developed metastatic calcinosis of the penis and scrotum causing dysmorphic changes, however maintaining full erectile function. Preserving the erectile function after successful excision of the penile and scrotal calcification is imperative to maintain good quality of life.

Key words: metastatic calcinosis cutis penis, erectile dysfunction, secondary hyperparathyroidism

Introduction

Metastatic calcinosis cutis, presents as nodular calcium deposits in the skin, and has an incidence rate of 0.5 - 3%, a rare complication among ESRD patients undergoing hemodialysis as a result of secondary hyperparathyroidism.[1,2] In a small group of hemodialysis patients, it was observed that patients with metastatic calcinosis cutis of the penis had erectile dysfunction, thus implicating penile calcification as one of the possible causes of erectile dysfunction in CKD patients.[3] The most common site affected are the pre-articular area, usually at the superior and lateral shoulder, posterior elbows, and lateral hip and gluteal regions.[4] Presently, limited local data on penile metastatic calcinosis cutis is available and this is the first reported case in this institution.

Presented in this paper is a case of ESRD patient on hemodialysis who developed metastatic calcinosis cutis of the penis and scrotum causing dysmorphic changes and occasional pain from extensive calcium phosphate crystal deposition. Moreover, the patient maintains full erectile function but is unable to perform sexual intercourse due to dysmorphic changes and pain. The challenge to the surgeon to preserve the erectile function after surgery cannot be overemphasized to maintain good quality of life.

The Case

This is a case of a 28 year old male diagnosed with chronic kidney disease secondary to chronic glomerulonephritis on hemodialysis for 5 years

who consulted due to a gradually enlarging nodule on his penile and scrotal area accompanied with occasional pain for 2 years. Patient had the same lesion at his upper lip and back, wherein biopsy of one of the nodules on his back revealed calcium deposits with inflammatory giant cells consistent with metastatic calcinosis cutis (Figure 1). Patient claimed to have good erectile function and was able to maintain sexual activity. The patient was advised to observe the lesion on his penis and scrotum, and pain medications were prescribed. Continuous growth of the penile and scrotal nodule with noted deformation of the penis resulted to inability to perform sexual intercourse which prompted follow up. Patient was referred to the Genito-Urinary Service with the physical examination findings of multiple scrotal nodules with aggregate measurements of about 6 cm closely related to the right testis, hard, movable, non-tender with no ulceration. There were at least three (3) hard, movable, nodules noted at the penile shaft extending circumferentially (Figures 2 & 3). Patients had elevated serum phosphorous and normal calcium level. PTH was also elevated. Scrotal ultrasound was done showing multiple calcified hyperechoic lesions diffusely scattered on the soft tissues of the scrotum and penile shaft (Figure 4). Patient underwent excision of the penile and scrotal calcifications under spinal anesthesia. Great care was done to achieve a normal looking penis as possible. Specimen was sent for histopathology (Figures 5 & 6). Patient followed up every month with good wound healing (Figures 7 & 8). Patient was able to resume sexual activity 2 months post-surgery Limitation of food rich in phosphorous was advised. Parathyroidectomy was also offered to the patient.

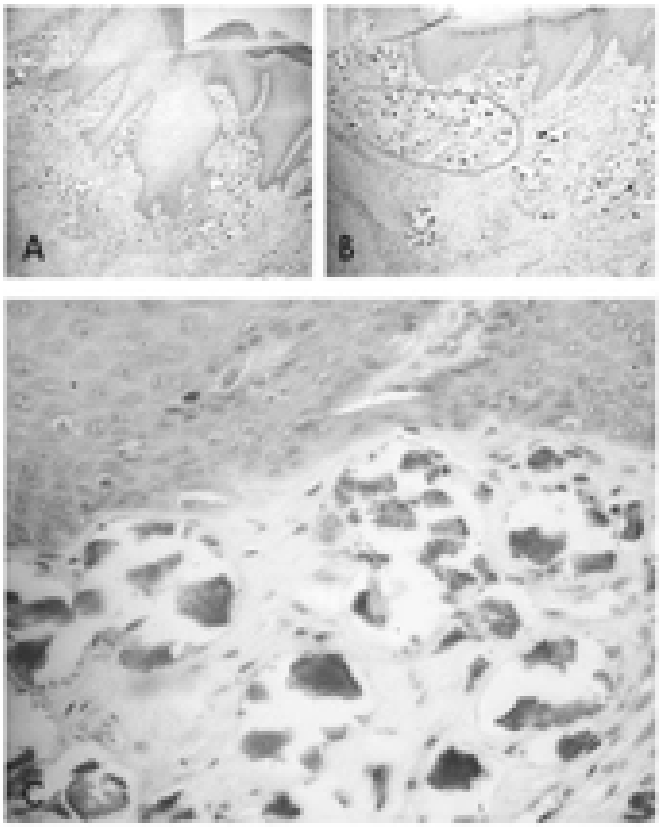

Figure 1. Soft Tissue mass, Back. A. Scanner magnification. B. Lower magnification. C. High power magnification. Presence of amorphous calcium deposits with foreign body giant cells - consistent with metastatic calcinosis cutis.

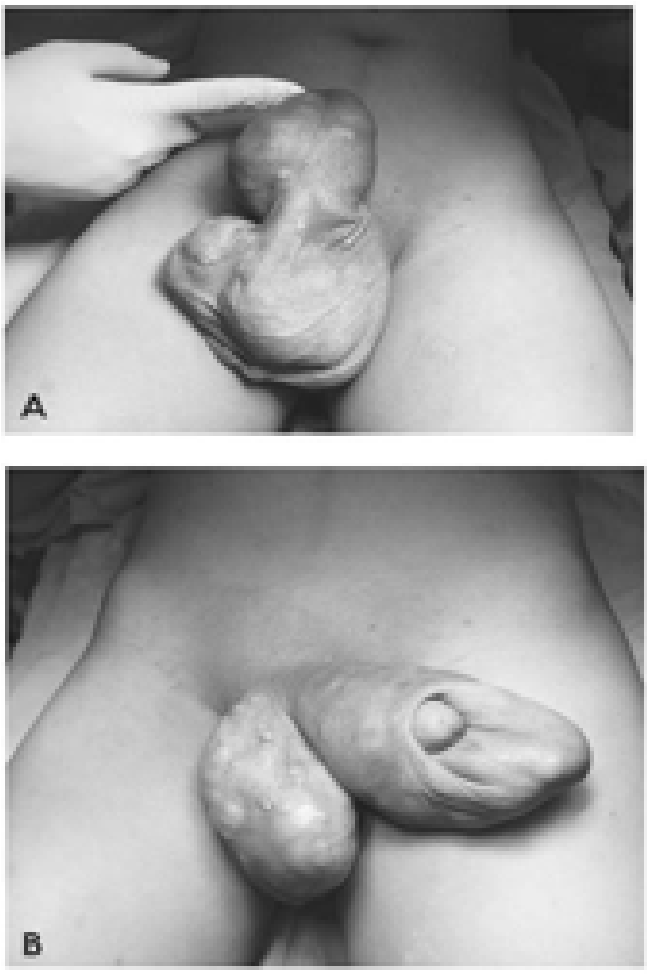

Figure 2. A. Ventral aspect of the penis and the scrotum. B. Doral aspect of the penis and right testicle. Extensive penile and scrotal nodular calcification causing dysmorphic changes noted.

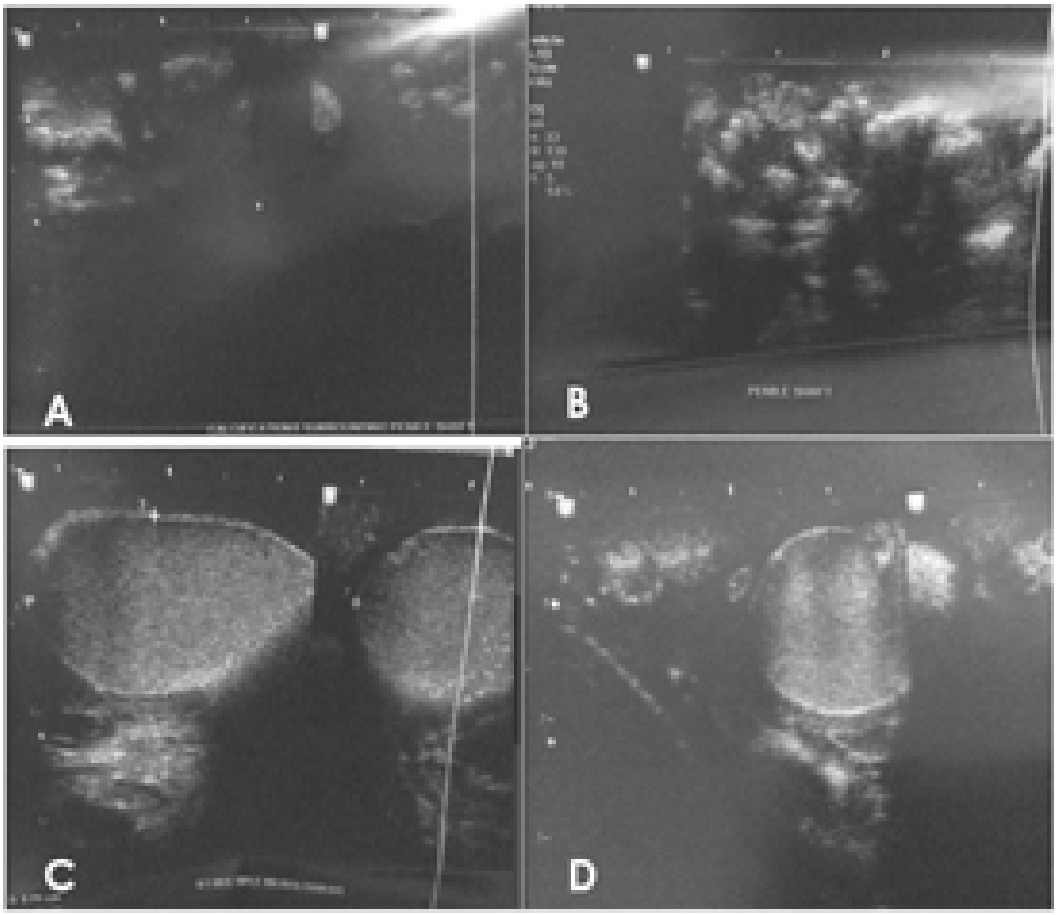

Figure 4. Ultrasound of penis (A,B) and scrotum (C,D) showing dystrophic soft tissue calcifications.

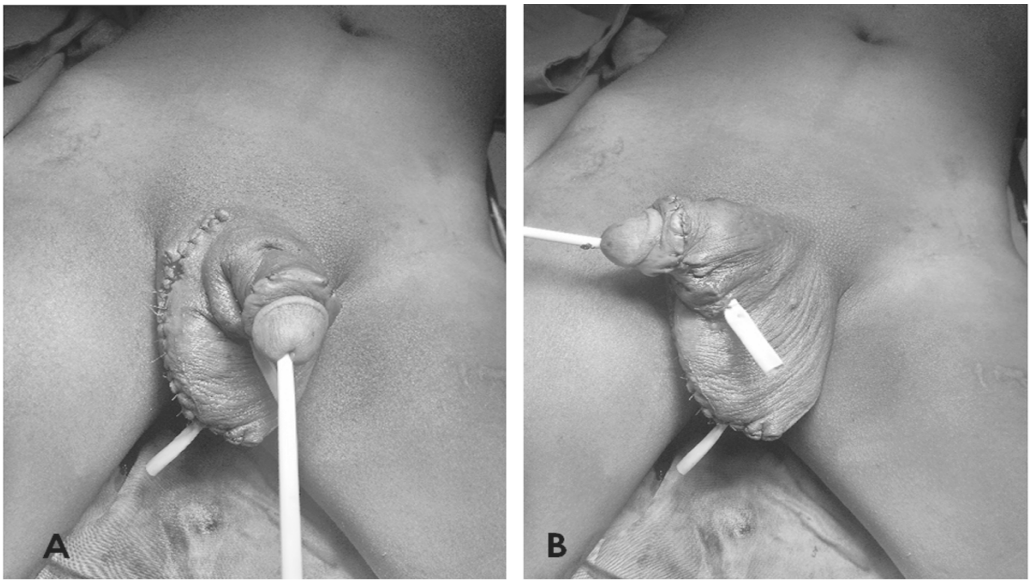

Figure 5. Tension free wound closure of penis scrotum with penrose drain.

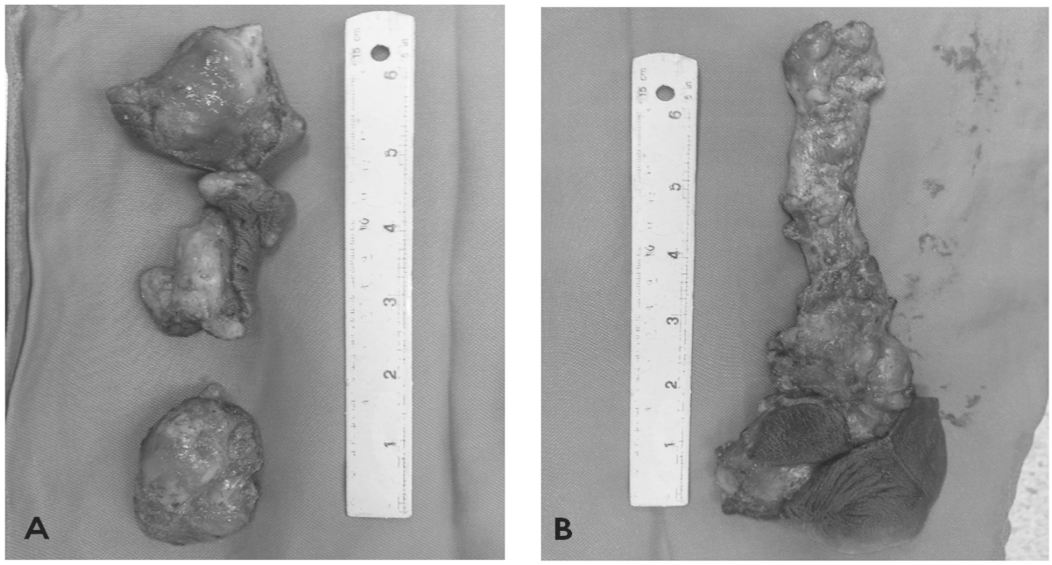

Figure 6. Excised penile (A) and scrotal (B) calcifications.

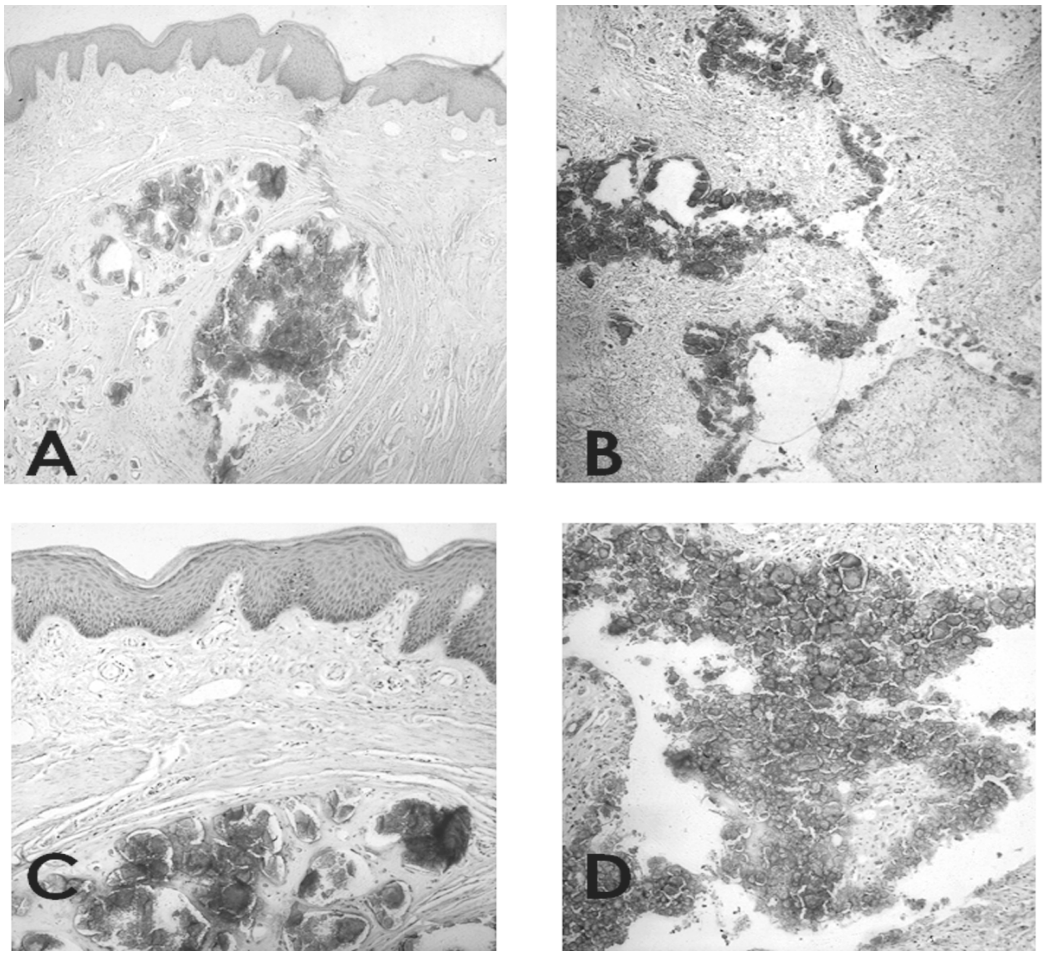

Figure 7. Scanner magnification of scrotal (A) and penile (B) specimen. Low magnification of scrotal (C) and penile (D) specimen. Presence of calcium deposits and foreign body giant cells seen - consistent with calcinosis cutis.

Figure 8. Post operative pictures. Lateral (A) Ventral (B) Dorsal (C) aspects.

Discussion

Calcinosis Cutis

Calcinosis cutis is defined as insoluble calcium deposits in the skin and subcutaneous tissue and has been classified into idiopathic, metastatic, dystrophic and iatrogenic.[5] These conditions are based on presence of metabolic abnormalities, presence of skin injury and medical intervention, and has distinct topographical distributions.

Types of Calcinosis Cutis

Four types had been described focusing on its pathological basis and its topographical distribution, namely metastatic, dystrophic, iatrogenic and idiopathic. Metastatic calcinosis cutis had been described in end stage renal disease patients undergoing dialysis and primarily caused by metabolic imbalance, mainly hyperphos-phatemia and hypercalcemia.[6] Hypercalcemia and hyperphosphatemia promotes precipitation of calcium deposits to multiple parts of the body. Dystrophic calcinosis cutis however is seen in the setting of normal phosphate blood level however, history of infection, trauma, inflammation or injury as the primary pathology and the affected site is the area of injury.[6] Iatrogenic calcinosis cutis is seen in patients who underwent medical intervention involving introduction or use of calcium containing drugs or products.[6] Idiopathic calcinosis cutis, which can be variably distributed, is rare and described in patients with normal calcium and phosphate level with no identifiable cause.[6]

Penile Metastatic Calcinosis Cutis

Metastatic calcinosis cutis occurs in about 1% of patients with ESRD on hemodialysis annually.[1] Abnormality of calcium and phosphate metabolism causes precipitation of calcium salts on uninjured tissue. The most commonly involved areas are near the joints and flexural sites appearing as yellow-white papules, plaques or nodules with varying sizes with in the skin.[7] Histopathological studies shows homogenous blue material (calcium) in the dermis and subdermis surrounded by inflammatory cells.[7]

Secondary hyperparathyroidism results from hyperphosphatemia and hypocalcemia in patients CKD patients on hemodialysis. Impaired synthesis of the active form of vitamin D decreases intestinal absorption of dietary calcium, hence hypocalcemia, while decrease excretion of phosphorous results to hyperphosphatemia. In CKD patient on hemodialysis, hyperphospathemia and hypocalcemia trigger production of PTH.[8] Hyperparathyroidism promotes resorption of calcium and phosphorous in the bone, resulting in increased serum calcium and phosphorous.[8]

Secondary Hyperparathyroidism and Erectile Dysfunction

Sexual dysfunction in CKD patient progress from 9% seen in pre-dialysis patients to 70% in dialysis patients of either sex.[9] Various mechanisms of erectile dysfunction on ESRD patient had been studied which include vascular, endocrine, neurologic, pharmacologic, anemia and hyperparathyroidism. Historically, some degree metastatic penile calcification had been reported in about 6 out of 32 or 19% of patients with CKD on hemodialysis by soft tissue radiograph.[3] In this report, erectile dysfunction was present in all patient with penile calcification implicating that penile calcification as a possible cause of erectile dysfunction. Supporting study showed that parathyroid suppression by calcitriol or parathyroidectomy results in improved sexual function either by enhancing testosterone or reduction of PTH and prolactin.[10]

Treatment

Normalization of calcium and phosphorous levels is the main focus of the treatment which could be achieved by limiting dietary intake of foods rich in dietary phosphate (such as milk and milk products, salmon, broccoli, beer and nuts), and using phosphate binders.[11,12] Parathyroidectomy should be an option if medical management is unsuccessful.[13] Surgical excision remains the gold standard in the diagnosis and treatment of extensive calcinosis cutis even in the scrotal and penile area. Limiting the use of electrocautery prevents irreversible damage to erectile bodies and avoids post-operative infection.[14]

Conclusion

Although commonly reported for penile calcinosis cutis, and in CKD patients in general, ED was not evident or prevented probably due to early intervention, early stage and young age of patient. Having presented with a rare case of a patient with ESRD on hemodialysis who developed metastatic calcinosis cutis in the penis and scrotum with full erectile function, the challenge to preserved erectile function is paramount and as near normal architecture and form to maintain good quality of life. Surgical excision should aim to provide acceptable aesthetic and functional result. Normalization of serum calcium and phosphorous should be the main treatment goal. Parathyroidectomy offers a more absolute option to prevent recurrence of metastatic calcinosis cutis.

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