Concurrent preputial calculi and penile carcinoma – a rare association

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Summary: A case of concurrent preputial calculi and carcinoma of the penis is reported. The causal relationship of both the lesions is still controversial and the possible common aetiopathogenesis of the entity is discussed.

Introduction

Preputial calculi and carcinoma of the penis in the adult are not uncommon clinical entities, but their association has not previously been reported in English language publications.

Case report

A 65 year old male presented with progressive difficulty in voiding and foul smelling penile discharge of 8 months' duration. Physical examination revealed a tight phimosis, a hard preputial mass and significant bilateral inguinal lymphadenopathy. Soft tissue X-ray of the penis showed a radio-opaque shadow in the preputial area, and circumcision exposed three faceted preputial calculi (Figure 1), with an underlying balanic malignant ulcer. The shaft of the penis and urethral meatus were free from the disease. Aspiration cytology of bilateral inguinal nodes showed carcinoma. The pre-operative serum calcium level was raised at up to 3 mmol/l. Plain X-ray of the kidneys, ureter and bladder was normal. Stone analysis revealed 60% calcium-ammonium-magnesium-phosphate and 40% magnesium-calcium-urate. Preputial culture yielded a growth of *Escherichia coli* on 3 occasions. The patient was treated with partial penectomy and bilateral inguinal block dissection. The post-operative serum calcium level was 2.75 mmol/l.

Discussion

Though preputial calculi and cancer of the penis have many common possible predisposing factors such as

Figure 1 X-ray of penis showing radio-opaque shadow in sub-preputial space. Inset shows the position of the stones.

the carcinogenic and calculogenic effect of smegma, the presence of phimosis, and poor genital hygiene, the exact causes have not been well defined. Squamous cell carcinoma as a result of chronic irritation by stone is known to occur in the renal pelvis¹ and urinary

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bladder,² but this phenomenon has not been observed before in the sub-preputial space. In our case, multiple, faceted stones composed principally of ammonium-magnesium-phosphate favours urinary stasis as one of the pre-disposing factors. Inspissated smegma acts as a calculogenic nidus and induces inflammatory sub-preputial adhesion, resulting in obstruction with urinary stasis. It has been reported that a high level of beta-glucuronidase content of *E. coli*³ potentiates the production of carcinogenic nitrosamines from inactive nitrates in urine.⁴ Persistent infection of the sub-preputial space and stasis of urine favours the infective theory of carcinogenesis and calculogenesis simultaneously in this case.

Hypercalcaemia has been noted in 94% of cases of cancer of the penis with inguinal metastasis,⁵ but secondary preputial calculus formation has never been

reported in these circumstances. Hypercalciuria definitely favours encrustation in the preputial space when associated with stasis.⁶ Preputial calculi have been classified by their composition: (1) inspissated smegma; (2) smegma and urinary salts; (3) urinary salts alone.⁷ In hypercalciuric persons, rapid crystallization can occur, if it is associated with aggregation, stasis in urinary system and presence of foreign body.⁶ In the presence of phimosis the sub-preputial space acts as a reservoir (secondary bladder), which promotes urinary stasis, infection and mineral crystallization, similar to pathogenesis of vaginal calculi.⁸⁻¹⁰ The simultaneous process of calculogenesis and carcinogenesis could have been initiated and enhanced by long standing sub-preputial urinary stasis by phimosis, persistent sub-preputial infection and secondary hypercalcaemia.

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