Case Report

A Rare Case of Carcinoma Base of Penis : Evaluation on Ultrasound Color Doppler, Computed Tomography and Magnetic Resonance Imaging

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Carcinoma base of penis is an extremely uncommon condition. Usually glans penis is the most commonly affected site. A 55-year-old male presented with a mass at the base of penis. High frequency ultrasound and Doppler showed an ill-defined, heterogeneous, predominantly hyperechoic mass at the base of penis. No calcification was present within the mass, Moderate vascularity was present. Computed tomography showed a relatively well-defined, lobulated, soft tissue attenuation mass with heterogeneous enhancement on post-contrast study. On Magnetic Resonance Imaging, the mass was hypointense on T1WI, hyperintense on T2WI and STIR with restricted diffusion on DWI and heterogeneous post gadolinium enhancement. Histopathological examination findings were consistent with Squamous Cell Carcinoma of base of penis.

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Key words **: Carcinoma Penile Base, Penile Doppler, Circumcision, Penile Tumor Imaging.**

Penile Carcinoma can develop in at any age but is mostly seen in men at the age of 50-70 years. Patient classically presents with palpable penile mass with pain, foul smelling pus discharge and bleeding. The mass may be nodular, ulcerative or lobulated. Patients can develop physical and psychological consequences. The frequently involved site for penile carcinoma is the glans, prepuce and shaft in descending order of prevalence[1]. Involvement of base of penis is uncommon .Presence of foreskin is the significant predisposing factor for penile Carcinoma. Non-circumcised people have higher incidence of developing Carcinoma. Other predisposing factors include chronic inflammatory conditions, smoking, psoralen treatment, poor hygiene, ultraviolet photochemotherapy and human papillomavirus infection. Physical examination aids in determining the size and extent of mass. Ultrasound (US), Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) are useful for staging penile Carcinoma. MRI is the most sensitive imaging modality for evaluation and staging. Squamous Cell Carcinoma is the most common histopathological type in penile malignancy[2]. In our case report, we have described US, CT and MRI features in a 55-year patient who presentedwith mass over the base of penis.

Case Report

Patient Information — A 55-year old patient presented with a mass at the base of penis for 2 months.

Editor's Comment :

- Carcinoma base of the penis is an extremely uncommon malignancy.
- Physical examination fails to determine the exact depth of invasion.
- MRI is the most sensitive & accurate modality for evaluation, staging & follow up.

Clinical Examination — Relatively well-defined, non-mobile, firm, non-tender mass at the base of penis. No local skin discoloration or raised local temperature.

Diagnostic Assessment — High Frequency Ultrasound demonstrated an ill-defined, heterogeneous but, predominantly hyperechoic mass of size 3.94 x 3.8 x 3.49 cm at the base of penis. The mass was thick-walled with multiple echogenic foci within it. There was no calcification within the mass (Fig 1). Moderate vascularity was seen on Color Doppler (Fig 1). Contrast Enhanced Computed Tomography (CECT) showed relatively well-defined, lobulated, soft tissue density mass lesion of size 3.9 x 3.87 x 3.4 cm at the base of penis and extending upto shaft. The mass was also involving the distal corpus spongiosum, both corpora cavernosa and overlying fascia. Mass showed heterogeneous enhancement on postcontrast study. Few sub centimetric lymph nodes with maintained fatty hilum. were also present in bilateral deep inguinal region. On MRI, the mass was well-defined, lobulated. It was hypointense on T1 weighted image and hyperintense on T2 weighted image and STIR along with restricted diffusion on DWI. The lesion had encased the distal corpus spongiosum, both corpora cavernosa and overlying fascia with proximal infiltration. It had also involved small length of penile urethra (Figs 2-4). Post gadolinium contrast study showed heterogeneous enhancement.

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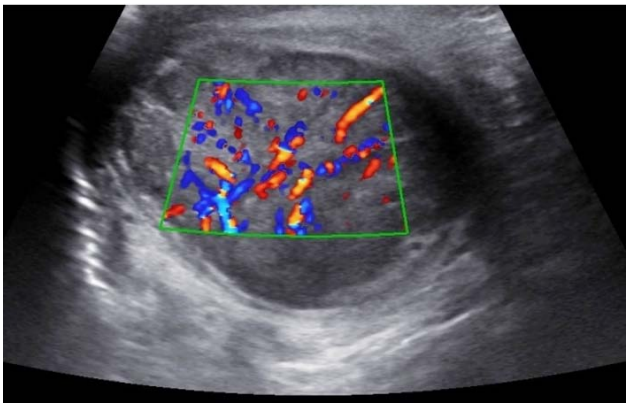

Fig 1 — Colour Doppler showing moderate-high vascularity within the mas

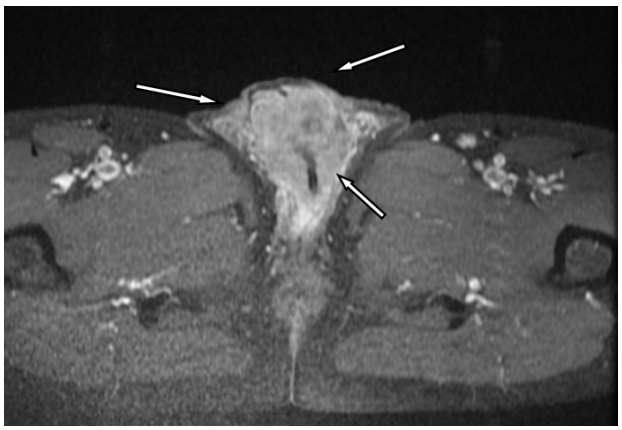

Fig 2 — Contrast enhanced MRI showing moderate heterogeneous enhancement of mass

Diagnosis — Histopathological examination findings were consistent with Squamous Cell Carcinoma of base of penis, stage T4N2M0.

Discussion

Penile Carcinoma is third most common male specific cancer, after testicular cancer and prostate cancer, affecting approximately 1/100,000 male population. Accurate demonstration of penile Anatomy is important for correct diagnosis and management of penile carcinoma. The penis is comprised of a base,present in the superficial perineal pouch, body consists of three tubular structures, ie, paired corpora cavernosa on the dorsolateral aspect and corpora spongiosum in the midline on ventral aspect, which also extends anteriorly as the glans penis. There are three connective tissue layers (tunica albuginea, buck fascia and dartos fascia) which cover the corpora of the penis[3]. When Penile Carcinoma is diagnosed in its localized form, the survival rate is quiet high at approximately 85%. In presence of regional lymphadenopathy, it drops down to 57%, and in distal metastases, the rate further drops to 11%[4]. Physical examination fails to determine depth or extent of tumor infiltration[5]. Lymph node involvement is

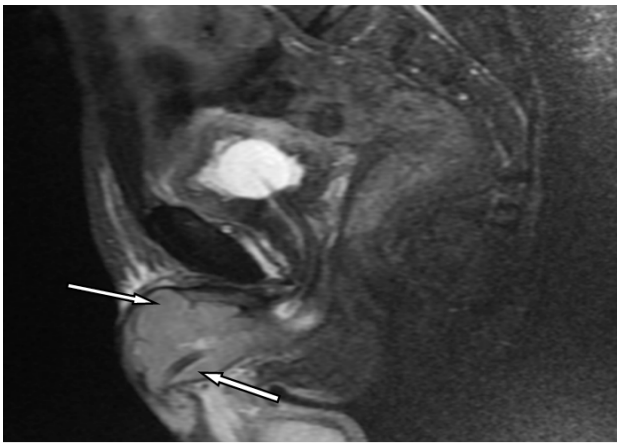

Fig 3 — Sagittal T2 weighted MRI showing iso-hyperintense mass at the base of penis with loss of fat plane

Fig 4 — Sagittal T1 weighted MRI showing hypointense mass at the base of penis with loss of fat plane

crucial in determining the prognosis of Penile Carcinoma. The spread via lymphatics is influenced by primary tumor location. Specifically, superficial inguinal nodes drain skin of penis and prepuce, while glans of penis drains into deep inguinal lymph node. Internal iliac lymph nodes drain erectile tissue, penile urethra[4]. Staging of Penile Carcinoma is done by TNM classification system as per AJCC 8th edition. The T indicates Tumor extent, TX- Tumor assessment not possible, T0- Primary tumor not demonstrable, Tis- Carcinoma in situ, T1a- Invasion of subepithelial connective tissue without lymph nodal involvement andT1b- Lymph nodal involvement. T2 - Corpus spongiosum invasion, T3- Corpus cavernosum invasion and T4- Invasion into other adjacent structures. The N stage gives idea about the spread to regional lymph nodes and ranges from NX- Assessment of regional lymph nodes not possible, N1- Less than 2 unilateral lymph nodes involvement,N2- More than 3 unilateral or bilateral lymph node involvement and N3- Extra nodal extension of any lymph nodal involvement like metastasis

in pelvic lymph nodes. The M indicates spread to distant organs or tissues, MX-Assessment of distant metastasis not possible, M1- distant metastasis[3]. High Frequency Ultrasound Doppler is the first line imaging modality for a Penile Carcinoma. It provides information about tumor extent and invasion into corpora. Superficial Inguinal lymphadenopathy can be detected, but Ultrasound is less sensitive in detecting deep inguinal and pelvic lymph nodes.Non contrast CT shows hypoattenuating mass. Post contrast CT provides contrast-enhanced images of soft tissue involvement, tumor characterization and also depth of lesion. CT is the imaging modality of choice for detecting metastasis. It also shows bony involvement. Lymph nodes in deep inguinal and pelvic region are also detected on CT[2]. On CT penile mass is usually iso-hypodense with moderate heterogeneous post contrast enhancement. On MRI, Penile Carcinoma is usually seen presenting as solitary, infiltrating mass and appear hypointense on T1WI and T2WI. MRI is a reliable method for accurately evaluating the local extension of the Penile Carcinoma, depth of tumor invasion,involvement of tunica albuginea, involvement of other surrounding structures. Moreover, MRI enables better visualization of adjacent soft tissues structures like urethra. Small and deep situated lymph nodes are also better demonstrated on MRI. Due to its superior ability to characterize soft tissues and multiplanar assessment of superficial structures, MRI is generally preferred over CT in evaluating and staging Penile Carconoma[3]. Diffusion-weighted imaging (DWI) is another MRI technique that does not rely on contrast administration. On DWI if the lesion shows restriction, it is indicative of malignant etiology[6].

Conclusion

Carcinoma of the base of penis is an extremely uncommon condition, affecting approximately 1/100,000 male population. Accurate demonstration Penile Anatomy and characterization of mass is important for correct diagnosis and management of Penile Carcinoma. High Frequency Ultrasound Doppler, CT and MRI are crucial modalities in diagnosis, staging, management and follow up.

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