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A CASE REPORT OF EARLY DETECTION OF RARE FEMORAL SHAFT BONE METASTASIS IN A PENIS CANCER PATIENT

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Abstract

Background. Bone metastasis is very common in the advanced stage of numerous carcinomas. In penile carcinoma, lymph nodes metastasis is somehow common but it is very rare reported to be secondary from penile cancer. Till the date, there are only few cases of penis carcinoma reported bone metastasis in literature worldwide. **Case Presentation.** Herein, We presented a 51-year-old Nepalese male with squamous cell carcinoma of penis. Computed Tomography (CT) scan of the patient revealed that there was carcinoma involving glans penis and precure with bilateral external & internal inguinal Lymphadenopathies. After then, the patient was under gone for partial penectomy and bilateral inguinal lymphadenectomy and complete 6-cycle chemotherapy. After one year of treatment, patient developed thigh pain and headache and he advised to have Magnetic Resonance Imaging (MRI) of brain, ^{99m}Tc-MDP whole body bone scan and CT scan of Pelvis and Thigh. The examination report reveals that there was a sclerotic change in vertex of skull bone and moderate ^{99m}Tc-MDP uptake in right proximal shaft of femur just below the neck D/D metastasis. The histopathological examination of the true cut biopsy taken from the lesion of the femur showed metastatic keratinizing squamous cell carcinoma which is rare case of femoral shaft bone metastasis secondary from penile carcinoma. Then patient was sent for surgical reconstruction of femur. Based on the case studies review femur shaft bone metastasis from penile cancer is extremely rare. **Conclusion.** The best of our knowledge; this is the first early detected bone metastases to shaft of the femur in a patient with penile cancer. Early diagnosis helps to radical treatment as well as palliative treatment. Surgery is the preferred option of the treatments, especially for metastatic foci in the long bones.

Key words: skeletal metastasis, penis cancer, femoral shaft, comprehensive management.

СЛУЧАЙ РАННЕГО ВЫЯВЛЕНИЯ МЕТАСТАЗОВ В БЕДРЕННОЙ КОСТИ У БОЛЬНОГО РАКОМ ПОЛОВОГО ЧЛЕНА

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Аннотация

Метастазы в кости часто встречаются на поздних стадиях разных злокачественных новообразований. Для рака полового члена характерно лимфогенное метастазирование, костные метастазы встречаются очень редко. На данный момент в мировой литературе зарегистрировано лишь несколько случаев рака полового члена с метастазами в кости. **Описание клинического случая.** Мы представляем описание клинического случая плоскоклеточного рака полового члена у 51-летнего мужчины из Непала. Компьютерная томография (КТ) выявила рак полового члена, локализованный на головке и крайней плоти с двусторонней паховой лимфаденопатией. Пациенту выполнена частичная пенэктомия, двусторонняя паховая лимфаденэктомия, проведено 6 курсов адъювантной химиотерапии. Через один год после завершения лечения у пациента появились боли в бедре и головная боль, рекомендована МРТ головного мозга, сканирование костей скелета с ^{99m}Tc -MDP и КТ таза и бедра. Обследование показало наличие склеротических изменений в теменной кости черепа и умеренное накопление ^{99m}Tc -MDP в проксимальном отделе правой бедренной кости ниже шейки. Гистологическое исследование биоптата, взятого из очага в бедренной кости, выявило метастаз ороговевающего плоскоклеточного рака, что является редким случаем метастазирования рака полового члена в диафиз бедренной кости. Пациент был направлен на хирургическую реконструкцию бедренной кости. Согласно обзору клинических исследований, метастазы в диафизе бедренной кости при раке полового члена встречаются крайне редко. **Заключение.** Представлен первый случай раннего выявления костных метастазов в диафизе бедренной кости у пациента с раком полового члена. Ранняя диагностика помогает как радикальному, так и паллиативному лечению. Хирургическое вмешательство является предпочтительным вариантом лечения, особенно при метастатических очагах в длинных костях.

Ключевые слова: костные метастазы, рак полового члена, бедренная кость, комбинированное лечение.

Background

Bone metastasis might be secondary from numerous sorts of cancers. On the opposite hand, penis cancer could be a fairly uncommon and localized malignancy. It always spreads via lymphatic routes, and hematogenous dissemination seldom occurs even within the advanced stage because of the natural barrier functions of Buck's fascia [1]. Metastatic bone disease secondary from penile carcinoma is extremely rare, with only few cases reported in literature worldwide thus far. Based on the case study and more importantly, the literature review, both skull vertex and femur shaft bone metastasis from penile cancer is extremely rare, to the best of our knowledge; this is the first report of a patient with penile cancer spread to the femur as well as skull bone from primary squamous cell carcinoma of the penis.

Case Presentation

A 51 year old male was referred to with an ulcerated lesion over the glans of the penis for one-year duration. A true cut histological biopsy finding was squamous cell carcinoma (SCC). The finding of Chest, abdomen and pelvis Computed Tomography (CT) scan of the patient was carcinoma involving glans penis and precure with bilateral external & internal inguinal lymphadenopathies. There was linear fibrosis in apical segments of both lungs. After then, the patient was under gone for partial penectomy and bilateral inguinal lymphadenectomy. In the resected specimen of the patient, microscopically findings showed full thickness dysplasia of lining epithelium and tumor cell infiltration in underlying stroma. Tumor cells are seen arranged in nests and islands with individual cell shows keratinizations intervening stroma showed

desmoplasia. Histopathological impression was moderately differentiated squamous cell carcinoma. According to the European Association of Urology (EAU) guidelines, he was diagnosed with penile carcinoma (pT3N3M0, stage II). Adjuvant TP chemotherapy regimen scheduled as 1 time per month after operation (paclitaxel 250mg continuous intravenous infusion 24 hours d, and cisplatin 40 mg d1-3, q3w).

Penile cancer usually occurs in the sixth decades of life, with SCC representing the most common pathological type. Penile cancer usually occurs in the sixth decades of life, with SCC representing the most common pathological type. For the diagnosis of metastatic bone disease, serological examinations are usually of low efficiency. Although hyper-calcemia is often presumed to be associated with bone metastasis because of osteolysis, it may be a hallmark of paraneoplastic syndrome but not of skeletal metastasis in penile cancer [2]. In most of these cases, the diagnosis was made through imaging and histopathological examinations. Of the 10 cases, histological biopsy of the metastatic foci was performed in 5 cases, including the present case. The results of biopsy are mostly well-differentiated SCC, and consistent with final pathological results.

After 18 months later, patient developed pain in right thigh and headache. Patient was undergone for ^{99m}Tc whole body bone scan, Computed Tomography (CT) of pelvis & thigh, Magnetic Resonance Imaging (MRI) of brain. There is moderate ^{99m}Tc -MDP uptake in right proximal shaft of femur just below the neck and vertex of skull in ^{99m}Tc -MDP whole body scan and static images of their respective (Fig. 1) mostly recommended as femoral bone metastasis followed with histopathology.

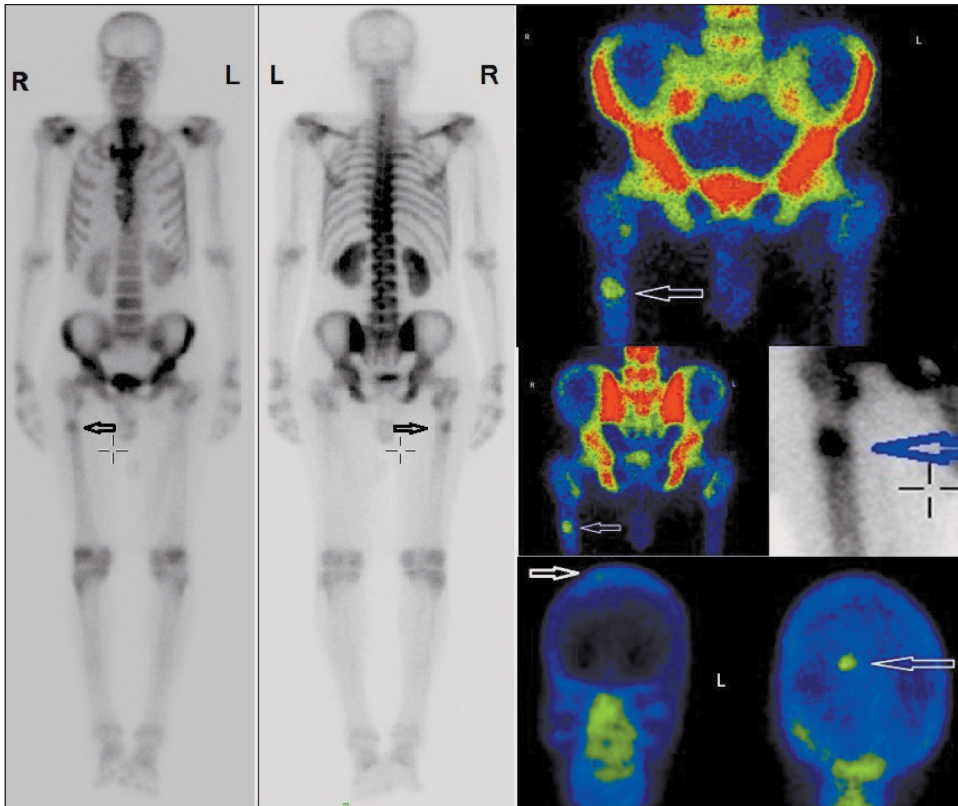


Fig. 1. There is moderate ^{99m}Tc-MDP uptake in right proximal shaft of femur just below the neck and vertex of skull in ^{99m}Tc-MDP whole body scan and static images of their respective. Note: created by the authors

Рис. 1. При сканировании всего тела с ^{99m}Tc-MDP наблюдается умеренное накопление радиофармпрепарата в проксимальной части правой бедренной кости ниже шейки, а также в теменной области черепа. Примечание: снимок выполнен авторами

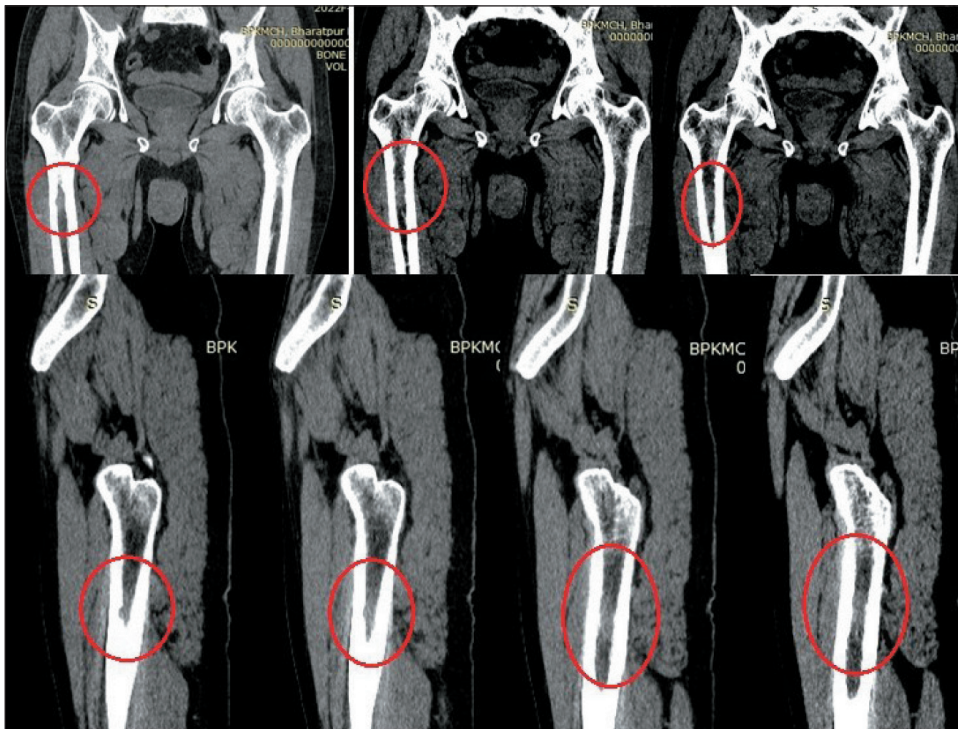


Fig. 2. There is metastatic like lesion in right proximal shaft of femur just below the neck in CT scan of Pelvis & Thigh and there are also bilateral inguinal lymph nodes metastases. Note: created by the authors

Рис. 2. КТ таза и бедра. Метастатическое поражение проксимального отдела правой бедренной кости ниже шейки, двусторонние метастазы в паховых лимфатических узлах. Примечание: снимок выполнен авторами

There was metastatic like lesion in right proximal shaft of femur just below the femoral neck in CT scan of pelvis & thigh and there were also bilateral inguinal lymph nodes metastases (Fig. 2). The Hounsfield unit (HU) of the metastatic lesion in femoral shaft was average 76.2 HU (Max^{im} 112 - Min^{im} 42 HU with SD ± 12) that is not normal. The HU of bone marrow should

be in minus figure. Confirmation for bone metastasis was followed with true cut biopsy. None Contrast and Contrast Enhanced CT scan of brain was also performed and showed there was a sclerotic change like lesion on the vertex of skull bone (Fig. 3).

Plain and Gadolinium contrast media enhanced MRI brain scan was performed. T1-TSE-Tra, T2-TSE-

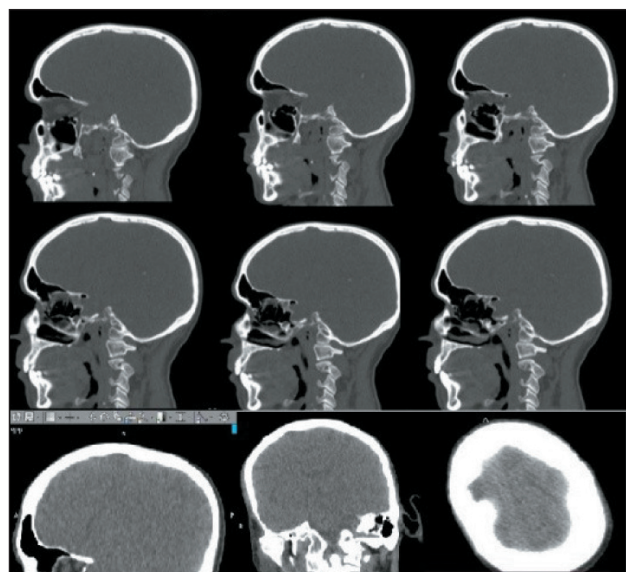


Fig. 3. There is sclerotic changes like lesion on vertex of skull bone of CT scan of brain. Note: created by the authors
 Рис. 3. КТ головного мозга и костей черепа. Склеротические изменения в теменной кости. Примечание: снимок выполнен авторами

Tra, T2-FLAIR-Tra, T1-TSE-Cor, T2-TSE-Sag, DWI-epi3trace-Tra, Contrast Enhanced T1-TSE-Tra and Contrast Enhanced T1-TSE-Cor series were performed. MRI scan concluded there was a sclerotic change like lesion on the vertex of skull bone (Fig. 4).

After that a histopathological examination of the true cut biopsy taken from the lesion of the femur showed metastatic keratinizing squamous cell carcinoma and patient sent for orthopedic surgery department for further treatment and follow up.

After that, the patient was undergone for surgery. Normally, in long bone shaft metastasis, an intramedullary rod has been placed down the center of the femur. The goals of bone stabilization in the lower extremity include preventing a pathologic fracture, relieving pain, and improving mobility and quality of life. But in our case, total proximal femur replaced to prevent the chance of new metastases in head and neck of femur and to decrease the chance of any other fracture. After 6 month of surgery, the patient felt better in walking and had a radiograph which is shown in Fig. 5.

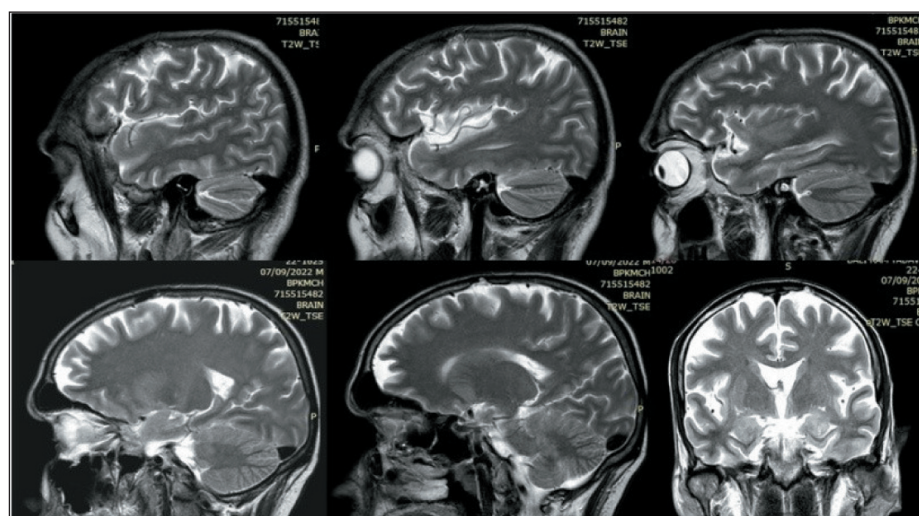


Fig. 4. There is sclerotic changes like lesion on vertex of skull bone of MRI scan of brain. Note: created by the authors
 Рис. 4. МРТ головного мозга и костей черепа. Склеротические изменения в теменной кости. Примечание: снимок выполнен авторами

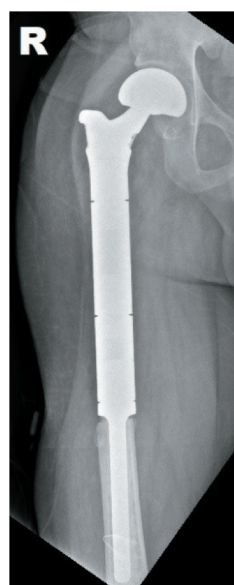


Fig. 5. Radiograph of post right proximal femur replacement of patient. Note: created by the authors
 Рис. 5. Рентгенограмма проксимального отдела правой бедренной кости после протезирования. Примечание: снимок выполнен авторами

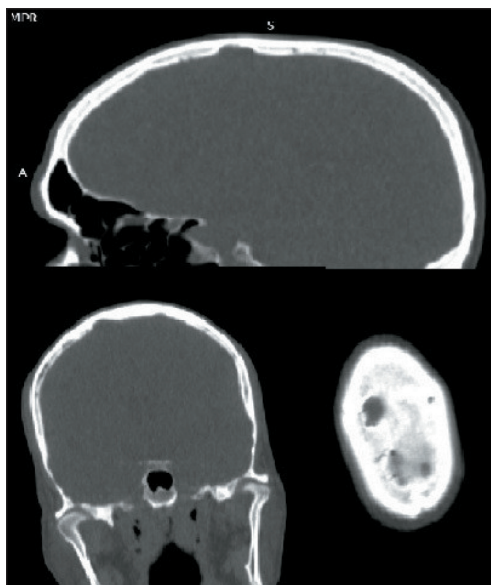


Fig. 6. There is sclerotic changes like lesion on vertex of skull bone of CT scan of brain. Note: created by the authors
 Рис. 6. Контрольная КТ головного мозга и костей черепа. Склеротические изменения в теменной кости. Примечание: снимок выполнен авторами

The patient was also undergone for CT scan of brain to evaluate the sclerotic changes in brain bone which was seen 6 months before. There was nothing changes in sclerotic lesion of skull bone after 6 month follow up (Fig. 6). Patient still felt dizziness and headache.

Discussion

Patients with penile cancer are a common in developing countries as well as in Nepal. In Nepal, the majority of the penile cancer patients reach to referral hospital very late. Early detection and timely treatment management are required to get better the overall result [3].

Bilateral inguinal lymph nodes metastasis is very common in patients with penile carcinoma but bone metastasis is very rare. The beginning of bone metastasis in patients with penile carcinoma mostly occurs after 18 months after conformal diagnosis of carcinoma. Radiological examinations and histopathological confirmation are important tools for the diagnosis of this rare individual. With aims of palliative treatment of patients with penile carcinoma, surgery is the preferred alternative of the treatments, particularly for metastatic foci in the long skeletons [4].

Patients with primary penis carcinoma with positive histological findings and no lymph nodes involvement have little risk for tumor metastasis. These types of patients are also most excellent well-matched for organ-sparing or glans-sparing treatment. Distant metastasis of patients with penile carcinoma is rare, and metastasis to the bones is even rarer.

This patient had developed femur as well as asymptomatic lung metastasis. Distant metastasis to the lung, liver, bone, or brain is uncommon [1] in the range of 1 to 10 %. A series of 380 patients with penile carcinoma analyzed by Prem Raj Sigdel [3], were included in the study. In that study, 78.5 % had clinically node-positive

disease. The most common treatment for the primary tumor was partial amputation of the penis (74.2 %). Bilateral inguinal lymph node dissections were done in 370 cases. The most common histology was the usual SCC in 94.2 % of cases and 69 % were well differentiated. T3 was the most common staging in 49.4 % cases. Pathologically nodal negative status was found in 58 % cases. In univariate analysis, factors like duration of symptoms (≥ 6 months), high-risk histopathology (basaloid/sarcomatoid variant), increased T-stage, poorly differentiated tumor, and the presence of PNI or LVI were significantly associated with lymph node metastasis.

This is the early detected case of femoral shaft bone metastases in patient with penile cancer which is rarer, to the best of our knowledge. Written informed permission was taken from the patient regarding publication of this case report. He had given consent to use his all reports for publication.

Fairly uncommon, penile cancer is a localized malignancy. The invasion pattern of penile cancer has been commonly described as lymphatic route spread, because the penis has a rich lymphatic network. We searched various medical websites for cases of osseous metastasis from penile cancer. We found very few cases of bone metastases, early detected femoral shaft bone metastases is most probably first one.

Conclusion

The onset of bone metastatic symptoms mostly occurs within two years after the diagnosis of penile carcinoma. ^{99m}Tc -MDP whole body bone scan, Radiologic imaging and histopathological examinations are valuable tools for early diagnosis of this rare entity. Early diagnosis helps to radical treatment as well as palliative treatment. Surgery is the preferred option of the treatments, especially for metastatic foci in the long bones.

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AUTHOR CONTRIBUTIONS

Ajay Kumar Yadav: study conception, study analysis, design, manuscript preparation and critical revision with the introduction of valuable intellectual content.

Sandip Kumar Mandal: literature search, critical revision with the introduction of valuable intellectual content.

Suman Gnawali: manuscript editing with valuable intellectual content.

Ganga Dutta Adhikari: manuscript review, clinical studies, data acquisition study analysis.

Nitu Sharma: clinical studies, data acquisition study analysis.

Pandey Shailesh Kumar: manuscript review.

Dhakal Deepika: manuscript review.

Anil Pandit: clinical studies, data acquisition study analysis.

All authors approved the final version of the manuscript prior to publication and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

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Conflict of interests

The authors declare that they have no conflict of interest.

Compliance with Ethical Standards

The study was conducted in accordance with ethical principles outlined in the Declaration of Helsinki approved by Ethics Committee of BP Koirala Memorial Cancer Hospital (Nepal), registration number 0159/078/079 dated September 8, 2022.

Voluntary informed consent

Written informed voluntary consent was obtained from the patient for the publication of a case report and facial photographs in medical journals (date of signing 07/11/2022).

СВЕДЕНИЯ ОБ АВТОРАХ

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ВКЛАД АВТОРОВ

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Ganga Dutta Adhikari: обзор статьи, клинические исследования, анализ исследования по сбору данных.

Nitu Sharma: клинические исследования, анализ данных.

Pandey Shailesh Kumar: обзор статьи.

Dhakal Deepika: обзор статьи.

Anil Pandit: клинические исследования, анализ данных.

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