Case Report

Psoas muscle metastasis in cervical cancer: A case study and literature review

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ABSTRACT

Cervical cancer is the second most common cancer in India. Despite having long disease-free survival post-treatment, patients do present with local recurrence or distant metastasis post-treatment. The usual sites of metastasis are lymph nodes, lung, bone, liver, and peritoneum. Skeletal muscle metastasis in a known case of carcinoma cervix is a rare entity. Less than 1% of cases have skeletal muscle metastasis and the differential diagnoses include sarcoma, hematoma, and abscess. Among the patients with skeletal metastasis, psoas muscle involvement is more common. Here, we report the case of a 60-year-old female who was diagnosed with carcinoma cervix FIGO stage IIIc1 based on clinical, radiological, and pathological findings. Post-radiation treatment (External Radiation with concurrent chemotherapy followed by Brachytherapy), the patient was on follow-up and then after 1 year presented with left lower backache. On positron emission tomography-computed tomography, a malignant mass was seen involving the left psoas major muscle. Pathological examination showed metastatic squamous cell carcinoma with a known primary in the cervix. She is now on Palliative Chemotherapy.

Key words: Cervical cancer, Metastasis, Skeletal muscle

Cervical cancer is the second most common cancer in India and the eighth most common cancer worldwide, with 1,27,526 new cases diagnosed in India alone (Globocon 2022 data) [1]. Usually, these patients present in the later stages of the disease. Radiation therapy with concurrent chemotherapy followed by brachytherapy is the usual line of treatment [2]. These patients usually have a long disease-free survival [3]. However, some patients do present with local recurrence or distant metastasis post-treatment. The usual sites of metastasis are lymph nodes, lung, bone, liver, and peritoneum. Skeletal muscle metastasis in a known case of carcinoma cervix is a rare entity [4,5]. <1% of cases have skeletal muscle metastasis and the differential diagnoses include sarcoma, hematoma, and abscess [6]. Among these cases, metastasis to the psoas muscle is most common.

Here, we present a case of carcinoma cervix post-treatment with pathologically proven metastasis to the psoas major muscle.

CASE REPORT

A 60-year female presented with a complaint of vaginal bleeding for 2 months which was associated with per-vaginal discharge for 2 months in 2022.

Access this article online	
Received - 04 August 2024 Initial Review - 30 September 2024 Accepted - 15 November 2024	Quick Response code
DOI: 10.32677/ijcr.v10i12.4764	

On examination, there was 6 × 6 cm ulcero-proliferative growth involving the cervix, extending to the upper one-third of the vagina. Bilateral parametrium was involved up to the lateral pelvic wall. Pathological examination of the cervical specimen showed moderately differentiated squamous cell carcinoma (Fig. 1). The microphotograph shows papillae of malignant squamous epithelial cells with individual cell keratinization and focal keratin formation, infiltrating into the cervical stroma. (H and E, 40×).

The patient underwent 18F-fluorodeoxyglucose PET (Positron emission tomography)/computed tomography (CT) for staging and metastatic workup. It showed a fluorodeoxyglucose (FDG) avid lesion in the cervix (SUV-11.6) extending to the lower body of the uterus, upper vagina without paracervical extension with bilateral common iliac, and external iliac lymph nodes (SUV-6.2) (Fig. 2) which were labeled metastatic. Hence, based on clinical and radiological investigations the patient was staged IIIc1.

The patient was then treated with external beam Radiotherapy by VMAT technique, the dose delivered was 50.4 Gy in 28# along with 5 cycles of concurrent cisplatin (55 mg). Post-external beam radiotherapy, the patient was examined after 1 week for brachytherapy under anesthesia. Since cervical os was not negotiable, the patient was planned for a High dose rate-brachytherapy, 21Gy in 3# was delivered. The patient was on regular follow-up with negative PET-CT reports till May 2023.

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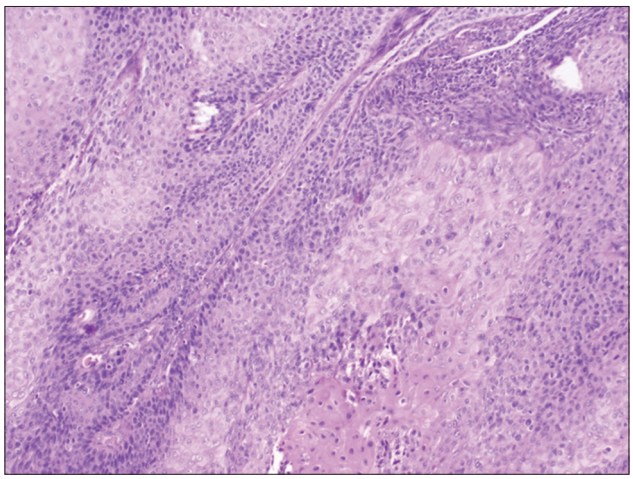

Figure 1: Histopathological examination showing moderately differentiated squamous cell carcinoma

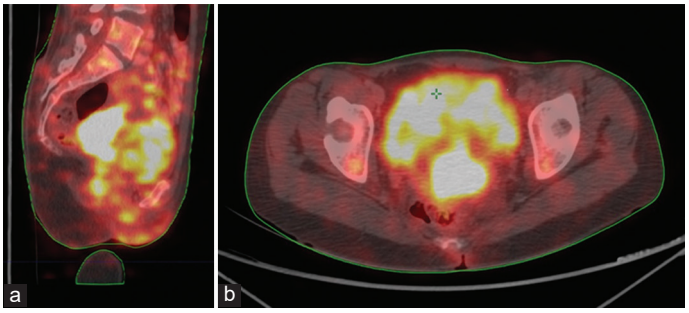

Figure 2: Initial positron emission tomography-computed tomography images showing fludeoxyglucose-avid lesion in the cervix (SUV-11.6) with bilateral common iliac and external iliac nodes (SUV-6.2) (a) sagittal view, (b) axial view

The patient presented to the Outpatient department with a complaint of left lower backache and abdominal discomfort for a few weeks. The patient was conscious, oriented, and appeared well-nourished. She had no signs of pallor, edema, cyanosis, or icterus on general examination. Tenderness was present over the lower lumbar region. She was given symptomatic treatment for the relief of pain and underwent PET-CT. It revealed an FDG avid soft tissue lesion in the left psoas major at the L4 level (size-2.3 × 1.4 cm SUV-8.6) (Fig. 3) which was described as infective, however, the clinicopathological correlation was advised. In addition, there were FDG avid subcentimetric portocaval, gastro-hepatic, paraaortic (size-7 mm, SUV-7), aortocaval, right common iliac, and right internal iliac lymph nodes.

A CT-guided biopsy from the left psoas muscle was advised to rule out malignant lesions. On pathological examination, the section showed pleomorphic squamous epithelial cells infiltrating the muscles in sheets, the cells were round to oval, having hyperchromatic nuclei with a moderate amount of eosinophilic cytoplasm and the adjacent fibromuscular stroma contained lymphoplasmacytic inflammatory infiltrate with areas of hemorrhage (Fig. 4). Based on these findings, the lesion was deduced to be metastatic squamous cell carcinoma with a known primary in the cervix. The patient was then planned for palliative chemotherapy and received 2 cycles of Paclitaxel (240 mg) + Carboplatin (300 mg) till April 8, 2024. Response PET-CT scan

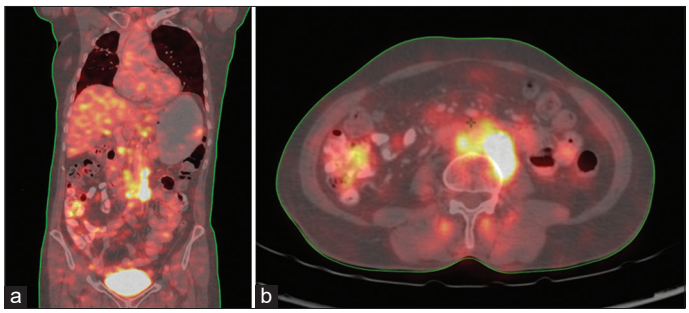

Figure 3: Positron emission tomography-computed tomography images showing fludeoxyglucose-avid soft tissue lesion in left psoas major at L4 level (size-2.3×1.4 cm SUV-8.6) (a) coronal plane, (b) axial view

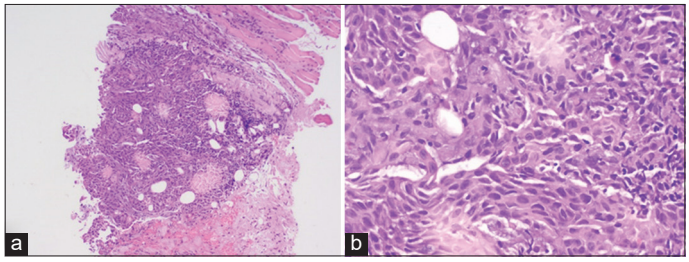

Figure 4: Moderately pleomorphic squamous epithelial cells infiltrating the muscles in the sheet. The cells are round to oval, having hyperchromatic nuclei with a moderate amount of eosinophilic cytoplasm. Occasional mitosis is seen. The adjacent fibromuscular stroma contains lymphoplasmacytic inflammatory infiltrate with areas of hemorrhage. (a) 10×magnification, (b) 40×magnification

was taken and metabolic as well as morphological regression was seen in the lesion in the Psoas muscle.

DISCUSSION

As stated earlier, according to Global Cancer Observatory data, cervical cancers are the eighth most common cancers worldwide and second most common cancer in females in India with 1,27,526 new cases registered in India in the year 2022 (Globocon 2022 data) [1]. Usually, these patients present in the later stages of the disease. Radiation and chemotherapy are the mainstays of treatment in the later stages of carcinoma cervix with 5-year DFS reaching 52.3% post-treatment [2,3]. Some patients progress to the development of metastasis. The commoner sites of metastasis in these patients are lymph nodes, bone, liver, lung, and peritoneum [4,5]. This pattern of metastatic cervical cancer has been studied historically based on large-scale autopsy studies [5]. However, with the advancement of imaging modalities including FDG PET-CT, distant metastasis is diagnosed more easily. It has been shown that as compared to CT and magnetic resonance imaging (MRI), PET-CT has more sensitivity and specificity for the diagnosis of distant metastasis. In spite of the imaging advances, it has been seen that metastasis to skeletal muscles is rare and difficult to diagnose [6-8].

Table 1 shows the review of the literature of 24 cases [6-18]. In 2017, a literature review was done by Skenderi *et al*., which described 19 cases of skeletal muscle metastasis in patients with cervical cancer [12]. Among skeletal muscle metastasis, the most

Table 1: Literature review over the years

Study	Year	No. of primary cases as the cervix	No. of cases	References
Smith and Gooneratne	1978	1	Case report	[11]
Schwartz *et al*.	1991	1	Case report	[17]
Singh *et al*.	1994	1	Case report	[18]
Bar-Dayan *et al*.	1997	1	Case report	[10]
Devendra *et al*.	2003	1	Case report	[9]
Saadi *et al*.	2003	1	Case report	[20]
Agar *et al*.	2004	3	Case report	[21]
Plaza *et al*.	2008	2	118	[13]
Stevens *et al*	2010	4	Case report	[15]
Hong *et al*.	2011	1	Case report	[6]
Kalra *et al*.	2012	1	Case report	[8]
Basu and Mahajan	2014	1	Case report	[16]
Kamal *et al*.	2014	1	Case report	[7]
Skenderi *et al*.	2017	2	Case report	[12]
Takamatsu *et al*.	2018	3	Case report	[14]

Total cases reported 24

common site is the psoas major muscle. Another large institutional review was done by Plaza *et al*., which reviewed 118 cases of skeletal metastasis over a period of 30 years. However, only 2 of those cases had cervical cancer as primary [13]. In another publication by Takamatsu *et al*., in 2018, they reviewed English literature on 39 cases of malignant psoas syndrome, and they stated that in patients of malignant psoas syndrome, female genital tract malignancies were the commonest site for the development of malignant psoas syndrome [14]. Out of a total of 39 cases, 7 cases had primary in uterine cervix [15,19].

Malignant Psoas syndrome was first described by Stevens in 1990 as a unique cancer-related syndrome consisting of symptoms due to ipsilateral proximal plexopathy and painful hip flexion which usually occurs due to pathologically or radiologically proven abscess of the psoas muscle. The pain involves both nociceptive and neuropathic components leading to being refractory to common pain management methods [16].

It has been shown that multiple factors contribute to the rarity of skeletal muscle metastasis in carcinoma cervix patients which include 1-contractibility of muscles leading to turbulent blood flow 2-unfavorable PH 3-presence of protease inhibitors [7]. A variety of imaging modalities have been used in the past for its diagnosis. Ultrasound usually shows heterogenous echotexture, whereas MRI shows subtle altered signal intensity, CT scan showed a well hypodense lesion with peripheral enhancement mimicking psoas abscess. FDG-PET usually shows intense FDG uptake. T1 and T2 W images of MRI showed altered signal intensity and diffusion-weighted imaging (DWI) showed restricted diffusion in the muscle. However, all these findings are usually non-specific and due to the rarity of the disease, confirmatory radiological findings haven't been explored yet. In addition, it should be noted that newer non-invasive modalities, such as PET-CT and DWI-MRI can serve as valuable adjunct parameters in diagnosing this entity [16].

As per our research, only 24 cases of Psoas muscle metastasis with primary in the cervix have been reported and published till date (Table 1) [9,17,18]. We have written this case report so as to add to the existing literature which would further help in defining the management of the patients.

CONCLUSION

Due to the rarity of literature on psoas muscle metastasis in carcinoma cervix patients, a definitive consensus on management has not been established yet. However, newer imaging modalities will help in the early diagnosis of such lesions and eventually lead to proper treatment in such cases.

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Funding: Nil; Conflicts of interest: Nil.

How to cite this article: Jain H, Bagri PK, Tripathy A, Chaudhary KG, Joshi H. Psoas muscle metastasis in cervical cancer: A case study and literature review. Indian J Case Reports. 2024;10(12):428-431.