

Initial clinical presentation of prostate adenocarcinoma with hernial sac metastasis: A review of literature

Sir,

Prostate cancer with metastasis to hernial sac is a rarely described entity, and asymptomatic isolated involvement is even rarer. Here, we report two cases of prostate cancer with initial diagnosis during hernia repair and will review the prior case reports.

The most common metastatic sites were the bone (84%), distant lymph nodes (10.6%), liver (10.2%), and thorax (9.1%).^[1] Prostate cancer has predilection for the skeleton as a primary site of metastasis, suggesting that the bone microenvironment is conducive to its growth. Prostate cancer metastasis proceeds through a complex series of molecular events that include angiogenesis at the site of the original tumor, local migration within the primary site, intravasation into the bloodstream, survival within the circulation, extravasation of the tumor cells to the target organ, and colonization of those cells within the new site.

CASE 1

A previously healthy 56-year-old African American male presented with right-sided inguinal hernia of several months duration, for which he was scheduled for an elective inguinal hernia repair. On gross visualization, the surgeon did not note any abnormalities of the hernia sac at the time of operation; however, the biopsy from hernial sac was sent for pathology which showed metastatic adenocarcinoma of prostatic origin, based on immunohistochemistry [Figures 1-3]. The patient denied experiencing any recent change in weight, loss of appetite, fatigue, urinary retention, hematuria, urinary hesitancy, or bone pain. Laboratory work showed elevated total prostate-specific antigen (PSA): 669 and free PSA: 36, with normal testosterone and normal alkaline phosphatase levels. To stage the tumor, the patient was sent for imaging; bone scan did not show any evidence of skeletal metastasis. Computed tomography (CT) chest/abdomen/pelvis with contrast revealed enlargement of the prostate gland measuring 6.3 cm mediolaterally × 5.8 cm in AP dimension × proximally 6.1 cm craniocaudally. No lymph

node involvement was seen. The patient was evaluated by urologist and was no biopsy was performed, as the patient

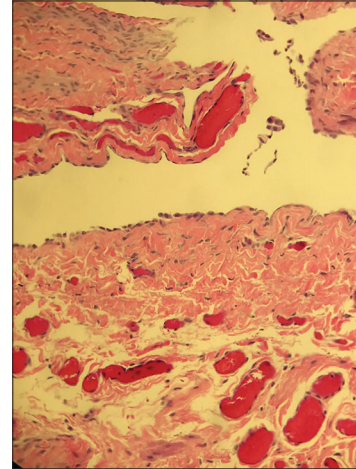


Figure 1: Prostate cancer in hernia sac (high power)

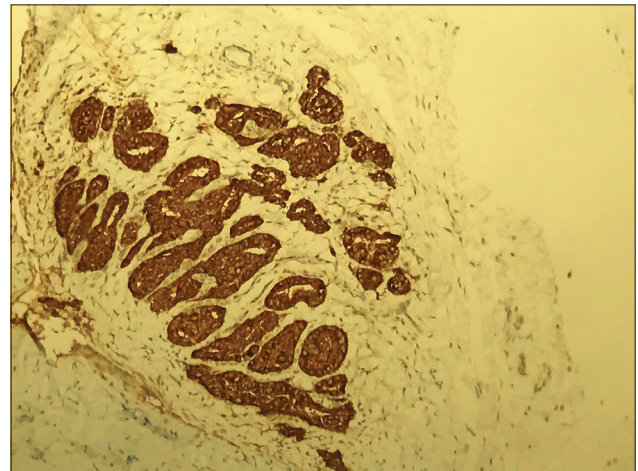


Figure 2: Prostate-specific antigen staining

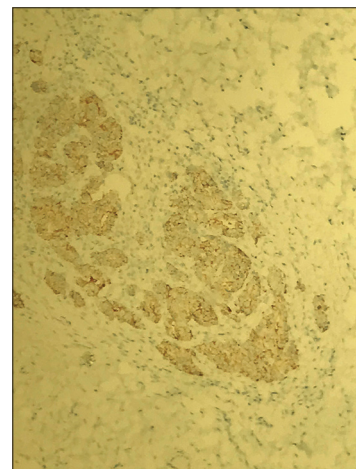


Figure 3: Acid phosphatase staining

already was proven to have metastatic disease. The patient was started on bicalutamide and leuprolide with good response in PSA level.

CASE 2

A 77-year-old African American male with no significant past medical history (PMH) presented noticed a lump in his right inguinal region, however, did not seek attention initially. The patient subsequently had difficulty voiding in a few weeks and was admitted to hospital with emergent Foley placement; he was discharged with outpatient follow-up with urologist. The patient subsequently had hernia surgery done which showed prostate cancer involving hernial sac. He subsequently had a transurethral resection of the prostate which also showed enlarged prostate of 11.5 cm × 8.5 cm × 3.5 cm prostate with prostate adenocarcinoma Gleason score of 3 + 4 = 7. He had chronic difficulty in urination for 3–4 years on further query. He denied bone pain, however, had some weightless of 20 pounds and hematuria's at the time of diagnosis was 190, with normal alkaline phosphatase and testosterone. His bone scan was negative, however, a subsequent positron emission tomography-CT showed hypermetabolic sclerotic lesion in the right ilium consistent with metastasis. The patient was started on bicalutamide and leuprolide with good symptom good response in PSA and he is being followed up.

DISCUSSION

Metastasis within hernia sac contents is an infrequent clinical finding, with a reported incidence of 0.5%–0.07%, most were gastrointestinal in origin.

Hernia sac tumors can be classified into one of the three groups: intrasaccular, in which an organ bearing the tumor is incarcerated within the sac; saccular, in which the tumor encompasses the sac or spermatic cord structures; or extrasaccular, in which the tumor protrudes through the hernia defect but is located outside the sac.

A literature search was performed in PubMed for previous case reports and series of prostate cancer in hernial sac [Table 1] which revealed nine prior cases.

Case reports of prostate cancer metastasis in literature.

Prostate cancer with hernial sac metastasis was first described by Lowenfels *et al.* in a series of five patients with occult malignancy detected during surgery or histopathological examination of hernial sac.^[2] The patient was a 73-year-old male with known diagnosis of prostate

cancer who had hernia surgery and was found to have abnormal hernial sac and histopathologically confirmed prostate cancer. The patient expired 3 months late; cause was not described.

Nicholson *et al.* described two cases of prostate cancer detected during hernia repair in a retrospective analysis of pathology reports from 1950 to 1988 in a single institution.^[3] The first case was a 74-year-old who had hematuria in addition to hernia symptoms and was alive 72 months after surgery. The second case was a 66-year-old male who had only hernia symptoms and was alive at 34 months follow-up. Interestingly, in their series, both tumors were extrasaccular and were the only malignancies which presented as extrasaccular tumors. Both patients had palpable or visible abnormalities in the hernial sac during surgery.

A case report by Houghton *et al.* describes a case of cancer deposits detected in the peritoneum when the patient presented with incarcerated inguinal hernia and was taken for hernia repair.^[4] The patient had prior weight loss and altered bowel habits and initial diagnosis of colon cancer was made. However, the patient was noted to have a hard lump in the prostate on subsequent physical examination and a review with immunohistochemical confirmed prostate adenocarcinoma. The patient subsequently was found to have bone metastasis; however, he responded well to androgen deprivation therapy. PSA levels were not reported in the study.

Chung *et al.* described a case of prostate cancer metastasis to hernial sac in a patient with prior history to prostate cancer.^[5] The patient presented with hematuria and was found to have early prostate cancer and underwent radical prostatectomy. Five years later, the patient was found to have hernial sac metastasis during right inguinal hernia surgery. No other evidence of metastasis was found at that time, and surprisingly, PSA was undetectable at the time of metastasis. Grossly, no abnormality was described by the surgeon regarding the hernia sac.

Liu *et al.* published a case report of prostate adenocarcinoma diagnosed using PSA screening.^[6] A 65-year-old male was found to elevated PSA of 300 and physical examination revealed a hard prostate and 3.5 cm right inguinal hernia which was irreducible. CT scan done for staging purpose revealed thickening of hernial sac and bone scan was negative for metastasis. During surgery, a nodule was noted in posterior wall of hernial sac which was consistent with adenocarcinoma on microscopic examination. PSA decreased drastically following hernia surgery, and the

Table 1: Case reports of prostate cancer metastasis in literature

Patient age	Type of hernia	PSA	Clinical presentation	Reference
74	Inguinal	NA	Hematuria	Nicholson <i>et al.</i>
66	Inguinal	NA	Groin pain, LE edema	Nicholson <i>et al.</i>
64	Inguinal	<0.01	Hernia only	Chung <i>et al.</i>
65	Inguinal	321	Elevated PSA	Liu <i>et al.</i>
69	Inguinal	Not reported	Left inguinal pain	Houghton <i>et al.</i>
73	Inguinal	NA	Hernia only (history of prostate CA)	Lowenfels <i>et al.</i>
54	Inguinal	Not reported	Incarcerated hernia	Lin <i>et al.</i>
73	Inguinal	716	NA	Rodríguez Alonso <i>et al.</i>
54	Paraumbilical hernia	Not reported	Hernia	Roberts <i>et al.</i>

NA: Not available, PSA: Prostate-specific antigen

patient was subsequently treated with androgen deprivation therapy.

A further report of two cases of prostate cancer with hernial sac is available in a review by Roberts *et al.* in a retrospective study of 3117 hernial sacs examined following surgery.^[7] They have reported the only case of paraumbilical hernia with prostate cancer metastasis in a 54-year-old and another case of right inguinal hernia which presented as incarcerated hernia. Both cases PSA was not reported and hernial sac was grossly normal.

Finally, Rodríguez *et al.* describe a case of prostate cancer incidentally discovered during right inguinal herniorrhaphy. The patient was found to have elevated PSA of 716, with nodule in prostate and subsequent CT scan and bone scan showing bone metastasis. The patient died 15 days later due to worsening of preexisting heart failure.^[8]

The age at the time of prostate cancer with hernial sac varied from 54 to 77. Four cases were detected in the pre-PSA era and level of PSA is not available. PSA was not reported in three studies, and there was one case with undetectable PSA levels. PSA in other cases varied from 100 to 700. Except two patients, all had some urological symptoms suggestive of prostate cancer before hernia surgery was performed; one of them in fact had diagnosis of prostate cancer before the actual surgery. There has been only one reported case of prostate cancer in paraumbilical hernia, rest were all inguinal hernia. Of the reported cases (including ours), three had synchronous metastasis of bone at time of diagnosis; no evidence of other metastasis was found in two reports, status of metastasis was not reported in the rest of studies. Gross abnormality of hernial sac was noticed by surgeon in 3 out of the 11 reported cases, rest of them were diagnosed at the time of histopathological evaluation. Both the patients we reported have excellent disease control; in the literature, there is one case with death 15 days following the diagnosis of hernial sac metastasis (due to heart failure); most cases patients were alive at the time of reporting with longest survival of 34 months. Of all the cases reported, only one

case was left-sided hernia; the rest were either right sided or not reported.

The paucity of literature on hernial sac metastasis limits any generalizations; however, from the review of earlier case reports, it seems safe to assume that most patients who were initially diagnosed as having incidental prostate cancer metastasis had some urological or constitutional symptoms on further elaboration of history. Prior literature is conflicting regarding recommendation to do routine histopathological examination of the hernial sac. In our review of literature, we found that majority of hernial sac metastasis were missed on gross examination by surgeon, and there might be some utility in routine microscopic examination. Some authors in the past have suggested that acute incarceration of long-standing hernia might suggest underlying malignancies found only one such case in our review.

The route of metastasis of prostate to hernia is unclear. Inguinal lymph node involvement without other lymph node involvement is not common in prostate cancer, so lymphatic spread is unlikely. Presumably, the tumor might have metastasized to the hernia sac via hematogenous dissemination, which would suggest that other sites of metastases might also have existed but remained occult.^[9] The other interesting possibility is that this might be a local spread of the tumor through spermatic cord or arising out of ectopic prostate tissue. This would mean that cancer could probably be treated as locally advanced, although we found no prior cases treated as such.

In conclusion, we suggest that in patients who present with hernia, a careful history should be obtained to look for urological or constitutional symptoms. Furthermore, in such cases, microscopic examination of the hernial sac might give valuable clue to the presence of an underlying cancer which might be otherwise missed.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have

given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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