Prostatic Leiomyosarcoma –A Rare Case Report With Review Of Literature

A Dubey, G Sivananthan, T Bradel, R Koul

Citation

A Dubey, G Sivananthan, T Bradel, R Koul. *Prostatic Leiomyosarcoma –A Rare Case Report With Review Of Literature*. The Internet Journal of Oncology. 2010 Volume 8 Number 1.

Abstract

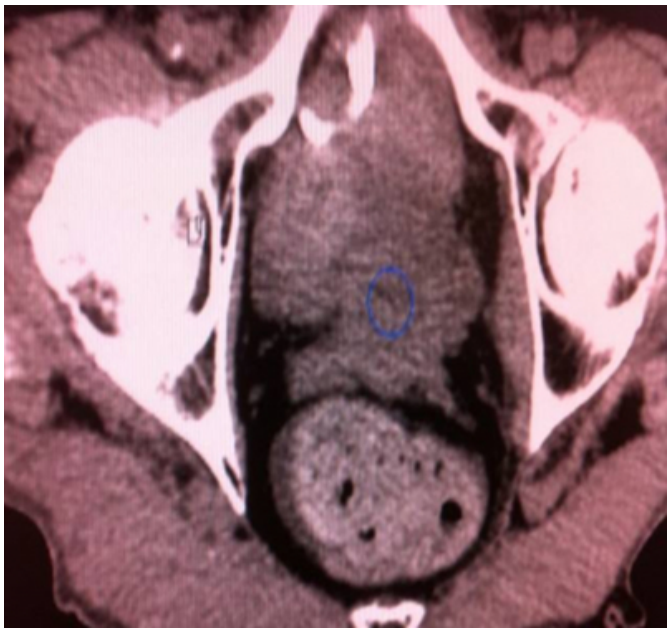
Majority of the prostate malignancies are adenocarcinoma in nature. Prostate leiomyosarcoma is an extremely rare and highly aggressive neoplasm that accounts for less than 0.1% -3.7% of primary prostate malignancies[1]. Prostate sarcomas are diagnostically and therapeutically very challenging. This neoplasm is a mesenchymal tumor that originates from smooth muscles of prostate and periprostatic tissue[2]. We present a patient with primary leiomyosarcoma of the prostate and review of literature. The factors predictive of long-term survival are negative surgical margins and absence of metastatic disease at presentation. A multidisciplinary approach is necessary for appropriate management of this rare entity. The most effective treatment, if feasible, is radical surgery. The role of adjuvant treatments and their effects in terms of increasing local control, over all survival or disease free survival is not clearly defined in literature[3].

CASE REPORT

A seventy three year old pleasant gentleman reported to local emergency in mid December 2010 with memory loss for the past one year. It had been getting progressively worse for the past few weeks. His wife thought that he had COPD and because of the decreased oxygen supply he was acting weird or he might have Alzheimer's disease. Around the same time he had been having a problem with his bowel movements and at times he had episodes of severe rectal burning. His wife thought he also had frequent micturition, dysuria, poor urinary stream and nocturia off and on for the last 3 months duration. The family denied any constitutional symptoms. There was no family history of genitourinary cancer. He was a non smoker, drank alcohol socially, and reported no exposure to hazardous chemicals in the past. Colonoscopy was normal with a benign polyp in colon at 35 cm. Base line blood work showed severe hyponatremia which possibly caused the confusion. Prostate specific antigen (PSA) at presentation was 2. 7 ng/mL, and his creatinine/urea was normal. Rest of blood work was normal. His last PSA, obtained 3 years earlier by his primary care physician as part of routine annual physical examination, was the same at 2.7uG/l. CT scan of the brain was normal .A CT scan of abdomen and pelvis showed a very large nodular prostate around 6 cm in size which was projecting into left posterior inferior aspect of the bladder and indenting into rectal lumen almost obstructing it near dentate line (Figure 1).

Figure 1

Figure 1 CT scan showing bulky prostate with indentation of bladder posterior wall.



No lymphadenopathy was seen. No other visceral disease was seen. Ct scan of chest did not show any metastatic disease. He was referred to an urologist. On digital rectal examination the prostate was very large, hard, nodular and bulging into rectal lumen almost obstructing lower

gastrointestinal tract. He was referred for an urgent transrectal ultrasound based biopsy of prostate but the procedure was abandoned as it was quite painful despite use of local anesthesia. The urosurgeon performed a trocar needle biopsy of the prostate in the operation room under sedation. During the procedure the doctor felt that the disease was much more advanced than what imaging showed. The biopsy was reported as malignant spindle cell tumor favoring leiomyosarcoma. Immunohistochemistry confirmed spindle cell proliferation was negative for PSA, S100, pancytokeratin, CD117 and CD34. The lesion was strongly positive for smooth muscle actin, calponin, CD 44 and focally for desmin (Figure 2 and 3).

Figure 2

Figure 2 Needle biopsy shows high grade leiomyosarcoma of prostate showing fascicular pattern with marked atypia and hypercellularity.

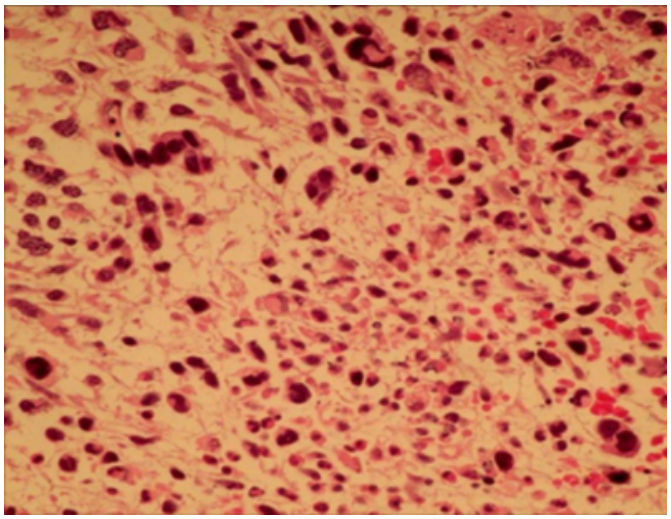
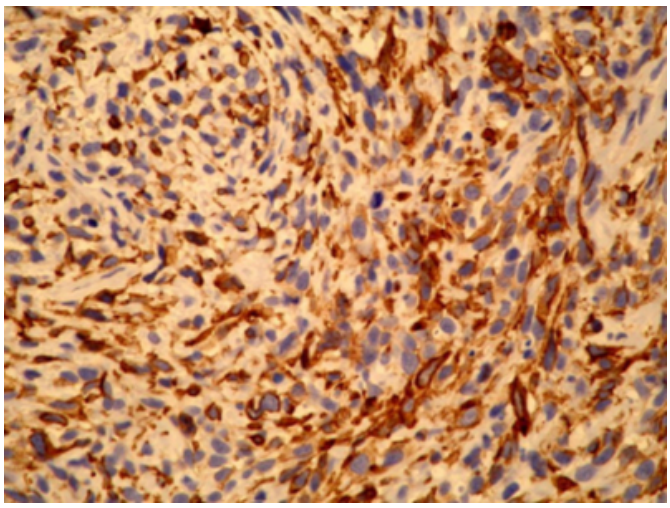


Figure 3

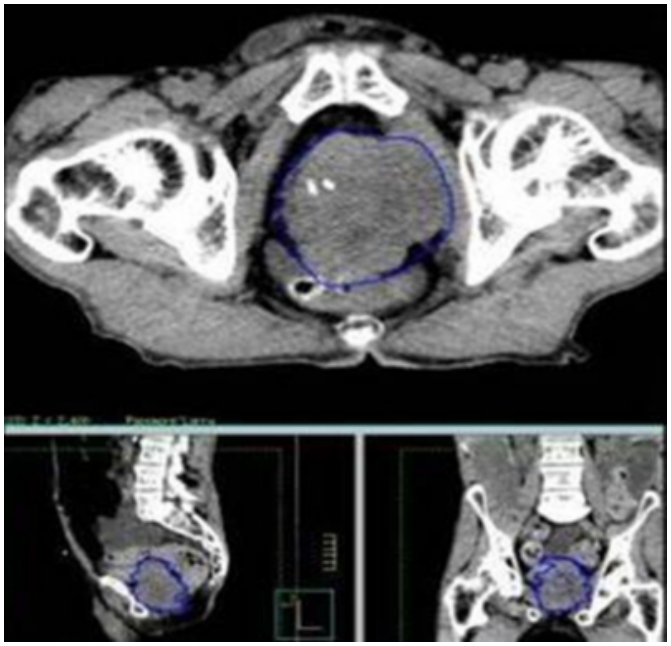
Figure 3 Immunohistochemistry demonstrates that tumor cells express smooth muscle actin and vimentin.



The patient continued to deteriorate in hospital and his perineal pain was getting worst. He subsequently developed urinary obstruction. Suprapubic cystostomy was performed as staff was not able to put the catheter in his penis due to severe pain. The patient was very agitated during his course of hospitalization. This case was discussed with the local multidisciplinary team and the group felt that the patient had a very rare tumor for which radical treatment is surgery which involves total exenteration of pelvis (removing bladder, rectum and prostate) or if tumor is bulky neoadjuvant chemotherapy with or without radiation followed by surgery would be necessary. With his low performance status the patient was deemed unsuitable for surgery. The medical Oncologist also felt his overall condition will not allow them to give any systemic treatment either. In the mean time his hyponatremia was resolved and his mentation got better. He had persisting hematuria. He opted for palliative radiation at least to stop the bleeding. On radiation marking CT images (Figure 4) his disease had progressed and was invading left pelvic wall near levator ani.

Figure 4

Figure 4 Planning CT scan showing progression of disease with invasion of side pelvic wall on left.



He was planned for 30Gy/10 fractions but due to agitation delivery was impossible so he received only single high dose 8 gray in single fraction which he tolerated quite well. The patient was transferred to palliative care unit as pelvic pain was not responding to regular narcotics'. He was switched to methadone. In few weeks post radiation bleeding was controlled. The patient however succumbed to disease and died in two weeks time.

DISCUSSION

Leiomyosarcoma is a mesenchymal tumor originating from smooth muscles of prostate and accounts for less than 0.1% of prostate malignancies. Leiomyosarcoma of the prostate is extremely rare, affecting men between the ages of 40–78 years and most frequently presents with urinary symptoms such as obstruction, frequency, hematuria, constipation and perineal/pelvic pain.[4] Lesions on trans ultrasound may range from 1 to 25 cm and are often infiltrative in nature. About 25% of new patients present with metastatic diseases at the time of diagnosis .The common sites of distant metastases are lungs, liver and bones.[5] The disease tends to travel via lymphatics and blood vessels, causing widespread regional and distant metastases[6].

Diagnosis is commonly obtained by transrectal ultrasound guided biopsy[7]. The light microscopic picture often show hypercellularity .They are composed of intersecting bundles of spindled cells with atypia ranging from moderate to severe. The vast majority of leiomyosarcomas in the literature have been high grade with frequent mitoses and necrosis, although there are few low-grade prostatic leiomyosarcoma reported as well[8]. Low-grade leiomyosarcomas are distinguished from leiomyomas by moderate amount of atypia, focal areas of increased cellular content, scattered mitotic figures, and a focally infiltrative growth pattern around benign prostate glands at the perimeter[9]. As opposed to some stromal sarcomas, leiomyosarcomas lack normal glands, except entrapped glands at the periphery. Similarly, sarcomatoid carcinomas differ from leiomyosarcomas in that they often contain admixed malignant prostatic glands[10]. A subset of these lesions is specific to the prostate and includes stromal tumors of uncertain malignant potential (STUMP), stromal sarcoma and sarcomatoid carcinoma (carcinosarcoma) of the prostate. Additional lesions that may involve the prostate with some frequency, in addition to other anatomic sites, include inflammatory myofibroblastic tumor (IMT), solitary fibrous tumor (SFT), smooth muscle tumors, and rhabdomyosarcoma[11]. Sclerosing adenosis may occasionally mimic a spindle cell neoplasm. Morphologic assessment of the benign or malignant nature of the spindle cell component, the admixture of benign or malignant glands, and the presence of heterologous elements are all useful features in distinguishing these lesions from one another[12]. Immunohistochemical results often show strong vimentin reactivity and positivity for CD34 and progesterone receptor. Pancytokeratin and CAM5.2 could be negative in some specimens[13]. Sometimes to differentiate between leiomyomas and common benign hyperplasia is difficult as small leiomyomas may be incidental findings on prostatic sampling that morphologically mimic a stromal nodule. Both leiomyomas and stromal nodules may contain abundant smooth muscle, although leiomyomas typically demonstrate well-organized fascicles that are not commonly seen in stromal nodules. Large single leiomyomas that are symptomatic are rare[14]. Leiomyomas demonstrate virtually no mitotic activity and minimal to no nuclear atypia, with the exception of occasional scattered degenerative nuclei in a normocellular background. In support of the term 'sarcomatoid carcinoma' it has been demonstrated that both the malignant epithelial and spindle cell components are clonally related[15].

Patients with leiomyosarcoma commonly have a poor outcome, with majority (50–75%) of patients dying within 2–5 years. The remaining patients frequently develop metastatic disease to the lungs in few years time since

diagnosis[16]. In one study, the information on the 54 cases compiled using the Pubmed and Medline databases for articles published in the last 20 years until March 1, 2008. The search terms used were prostate, sarcoma, leiomyosarcoma, and malignancy. A sizeable proportion of patients (23.5%) had metastatic disease at the time of diagnosis. Lungs were the most common sites of metastatic disease accounting for 17.6% of the cases, followed by liver (11.7%), and bone (5.8%). Only two patients had metastatic disease in the brain (3.6%).[17]

In the literature the prognosis for leiomyosarcoma of the prostate, depends on complete surgical resection with microscopically negative margins[18].Optimal treatment requires a multimodal approach rather than surgery alone. The best treatment program has not been defined yet, but combined modality treatment seems to yield the best result[19]. Surgical procedure with curative intent usually involves radical retro pubic prostatectomy, radical cystoprostatectomy, suprapubic prostatectomy, and pelvic exenteration[20]. Neoadjuvant treatments including chemotherapy or chemo-radiation should be considered if preoperative staging shows locally advanced disease. In such cases situation protocols like preoperative chemo-radiation followed by surgery and intra operative radiotherapy have been advised[21]. Chemotherapy regimens should consist of agents with activity against sarcomas like anthracyclins, ifosfamide, cyclophosphamide, dacarbazine[22]. Anecdotal reports exist, using combinations like cisplatinum, methotrexate and etoposide with acceptable efficacy[23]. There is no agreement on radiation dose but it seems at least 60 -66 Gray is required to achieve local control[24]. Local as well as distant relapse is quite common so lose follow up after definitive therapy using careful physical examination and imaging of thorax, abdomen and pelvis is recommended[25].

CONCLUSION

It is very important to correctly identify this rare entity and report its occurrence so that we can improve our understanding of the natural history of this neoplasm. The prognosis of leio¬myosarcoma is encouraging with aggressive combination treatment involving radical surgery and radiation therapy in carefully selective patients.

References

1. Ahlering T.E, Weintraub .P, Skinner D.G, "Management of adult sarcomas of the bladder and prostate," The Journal of Urology, vol. 140, no. 6, pp. 1397–1399, 1988.
2. P. Russo, B. Demas, and V. Reuter, "Adult prostatic sarcoma," Abdominal Imaging, 1993; 18 (4): 399–401.
3. Sexton W. J., Lance R. E., Reye A.O., Pisters P.W., Pisters L. L. Adult prostate sarcoma, the M.D Anderson center's experience. J. Urol. 2001; 166: 521-525.
4. Hansel D.E, Herawi .M, Montgomery .E, Epstein J.I, "Spindle cell lesions of the adult prostate," Modern Pathology 2007; 20(1):148–158.
5. P. A. Dundore, J. C. Cheville, A. G. Nascimento, G. M. Farrow, and D. G. Bostwick, Carcinosarcoma of the prostate. Report of 21 cases. Cancer 1995; 76(6):1035–1042.
6. Perez C. Principles and practice of radiation oncology.1998; 1: 1605-6.
7. J. D. Miedler and G. T. MacLennan Leiomyosarcoma of the prostate. The Journal of Urology, 2007; 178 (2):668-669.
8. Tsuzuki T, Magi-Galluzzi C, Epstein JI. ALK-1 expression in inflammatory myofibroblastic tumor of the urinary bladder. Am J Surg Pathol 2004;28: 1609–1614.
9. Eble JN, Sauter G, Epstein JI, et al (eds). The World Health Organization Classification of Tumors of the Urinary System and Male Genital Organs. IARC Press: Lyon, France, 2004, pp 160, 209–211.
10. Herawi M, Epstein JI. Specialized stromal tumors of the prostate: A clinicopathologic study of 50 cases. Am J Surg Pathol 2006;30:694–704.
11. Gaudin PB, Rosai J, Epstein JI. Sarcomas and related proliferative lesions of specialized prostatic stroma: a clinicopathologic study of 22 cases. Am J Surg Pathol 1998; 22: 148–162.
12. Grignon DJ, Ro JY, Srigley JR, et al. Sclerosing adenosis of the prostate- A lesion showing myoepithelial differentiation. Am J Surg Pathol 1992; 16: 383–391
13. Mobbs BG, Liu Y. Immunohistochemical localization of progesterone receptor in benign and malignant human prostate. Prostate 1990;16: 245–251.
14. Cheville JC, Dundore PA, Nascimento AG, et al. Leiomyosarcoma of the prostate. Report of 23 cases. Cancer 1995; 76: 1422–1427.
15. Ray ME, Wojno KJ, Goldstein NS, et al. Clonality of sarcomatous and carcinomatous elements in sarcomatoid carcinoma of the prostate. Urology 2006;67: 423.e5–e8.
16. Martini N,McCormack M. Evolution of the surgical management of pulmonary metastases Chest Surgery Clinics of North America, 1009;8(1):13-27.
17. Gerasimos P. Vandoros, Theodoros Manolidis, Michalis V. Karamouzis, et al., "Leiomyosarcoma of the Prostate: Case Report and Review of 54 Previously Published Cases. Sarcoma 2008; Article ID 458709: 5 pages.
18. Sexton W.J, Lance R.E, Reyes A.O, etal, "Adult prostate sarcoma: the M. D. Anderson cancer center experience," The Journal of Urology, vol. 166, no. 2, pp. 521–525, 2001.
19. Kuroda H., Yasunaga Y., Takatera H., Fujioka H., Tsujimoto M. Leiomyosarcoma of the prostate accompanied by multiple hepatocellular carcinoma. Hinyokika Kiyo 1994; 40: 147-9.
20. Garcia O, Alfaro J.M, Ferredo L., Ruiz J.L etal C. Leiomyosarcoma of the prostate, Arch. Esp. Urol. 1993; 46: 831-833
21. Sakano Y., Yonese J., Okubo Y., Yoshimura K.,Maeda H., Yamauchi T., Fukui S.Leiomyosarcoma of the prostate: a case report of remission for 9 years by radiotherapy. Hinyokika Kiyo 1995; 41: 629-32.
22. Le Cesne.A, Judson.I, Crowther.D, "Randomized phase III study comparing conventional-dose doxorubicin plus ifosfamide versus high-dose doxorubicin plus ifosfamide plus recombinant human granulocyte-macrophage colonystimulating factor in advanced soft tissue sarcomas: a trial of the european organization for research and treatment of cancer/Soft Tissue and Bone Sarcoma Group," Journal of Clinical Oncology, vol. 18, no. 14, pp. 2676–2684, 2000.
23. Suppiah R, Wood. L , Elson .P and Budd G.T , "Phase

I/II study of docetaxel, ifosfamide, and doxorubicin in advanced, recurrent, or metastatic soft tissue sarcoma (STS)," Investigational New Drugs, 2006; 24(6):509–514.
24. Vakilha1.M, Dadgar F.N, Tirgari .T, Leiomyosarcoma of prostate; Report of a case Iran. J. Radiat. Res., 2004; 1(4): 229-231.
25. Hansel DE, Epstein JI. Sarcomatoid carcinoma of the prostate: a study of 42 cases. Am J Surg Pathol 2006; 30: 1316–1321 .

Author Information

Arbind Dubey, FRCPC
Astt Prof, Staff Radiation Oncologist, University of Saskatchewan, Allan Blair Cancer Centre

Gokulan Sivananthan
Medical student, All Saints Medical School

Theresa Bradel, FCFP
Clinical Associate, Department of Radiation Oncology, Allan Blair Cancer Centre

Rashmi Koul, FRCPC
Associate Prof , Staff Radiation Oncologist, University of Saskatchewan, Allan Blair Cancer Centre