Sarcomatoid Carcinoma of Prostate: A Rare Entity

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Abstract:

Sarcomatoid carcinoma is an aggressive, rare malignancy of the prostate with less than 100 reported cases worldwide. A 60 year old male presented in our surgical outpatient department, with symptoms of bladder outlet obstruction and a prostate specific antigenof 0.94 ng/L. A clinical assessment of benign prostatic hypertrophy was made and prostatectomy was done. The specimen received in our laboratory consisted of two firm, grayish white nodular masses with variegated haemorrhagic surfaces. Histology revealed a biphasic tumor with a predominately spindle cell component (80%) as well as clusters and nests of small undifferentiated cells. Also seen were nests of a well differentiated keratinizing squamous cell carcinoma which were EMA positive. A few of the small undifferentiated cells and stromal cells were also EMA positive but negative for desmin. About 40% of cells in stained sections were positive for Ki67. A diagnosis of sarcomatoid carcinoma of the prostate with a Gleason score of 10 was made.

Key words: Prostatic hyperplasia, Prostate-Specific antigen, Carcinoma, Squamous cell, Desmin.

Introduction

Sarcomatoid carcinoma is a rare biphasic tumor which comprises of a malignant epithelial component and a mesenchymal like or mesenchymal component [1]. It is also called spindle cell carcinoma, carcinosarcoma, metaplastic carcinoma and malignant mixed mesodermal tumor. The cause of this biphasic malignancy is uncertain; it may represent a single malignant process i.e. all the cells develop from a single multipotent cell line or a mixture of two distinct malignancies developing from two different precursor cells [2]. This rare malignancy can occur in the prostate as well as other anatomical sites such as the kidney, lungs, head and neck [3]. In the prostate, it may occur spontaneously or after treatment of an adenocarcinoma usually of the acinar type. This transformation is said to be associated with over expression of p53 gene [4].

We report the case of a 60 year old man who presented clinically as a case of benign prostatic hyperplasia with normal serum prostatic specific antigen levels. Histopathologic findings however revealed a biphasic tumor having malignant epithelial and mesenchymal-like features.

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Case Report

In February 2012, a sixty year old man presented at the Lagos University Teaching Hospital (LUTH) having been referred from a General Hospital, where he had been diagnosed of bladder outlet obstruction with acute urinary retention (AUR). The AUR was relieved by urinary catheterization following which he was referred to our urology clinic for further management. At the urology clinic he gave a history of lower urinary tract symptoms (LUTS) of two years duration and recurrent hematuria of four months duration. There was no associated fever, purulent urethral discharge, weight loss, exposure to radiation or family history of similar illness. He took alcohol socially but stopped three years before presentation, he had no history of smoking.

Physical examination of the major systems was unremarkable. However, digital rectal examination (DRE) revealed an enlarged smooth firm prostate gland. A clinical assessment of benign prostatic hyperplasia was made. Investigations done included an ultrasound scan (USS) which showed an enlarged prostate gland. Serum prostate specific antigen was 0.964 ng/mL (normal: 0-4 ng/mL). Cystoscopy revealed a high bladder neck with a huge prominent median lobe of the prostate gland. Intravenous urogram revealed bilateral hydronephrosis.

A clinical diagnosis of benign prostatic enlargement (BPE) was made. The patient had an open prostatectomy and the prostate was sent to the histopathology department for examination. However, his post-operative period was stormy with continuous hematuria for over one week necessitating transfusion of up to 8 pints of blood. It also took over 5 weeks (instead of the usual 1 week) of continuous bladder drainage for the bladder/abdominal wound to heal. Seven weeks post operatively the patient was noticed to have chest symptoms. Chest X-ray confirmed pleural effusion necessitating insertion of a chest tube with drainage of serous fluid and improvement of chest symptoms. A clinical diagnosis of malignant pleural effusion was made and the pleura fluid aspirate was sent for cytology. The patient was reviewed by an oncologist and scheduled for chemotherapy. The patient however defaulted and has not been seen since then.

The sample from the prostatectomy was submitted in 10% buffered formalin to the histopathology department. The sample consisted of two grayish white multi-lobulated masses, together measuring 12×12×5 cm. Cut section through these masses showed alternating grayish white and hemorrhagic areas. Samples were routinely processed and embedded in paraffin. The paraffin blocks produced were sectioned and prepared into slides. The slides were stained with Haemotoxylin and Eosin.

Microscopy of these sections revealed prostatic tissue effaced by a biphasic tumor composed of an epithelial and a mesenchymal like, spindle cell component which made up 80% of the tumor population. The epithelial component varied from clusters of small undifferentiated cells to nests of well differentiated squamous carcinoma forming keratin. The proliferating spindle shaped cells with hyperchromatic, vesicular and pleomorphic nuclei, some of which were multi-nucleated and contained prominent nucleoli; frequent mitotic figures were seen.

Immunohistochemistry was done using Pan cytokeratin (Clone AE1/AE3, dilution of 1 in 100), EMA Ab-3 (Clone E29, dilution of 1 in 400), Desmin Ab-1 (Clone D33, dilution of 1 in 100), S100 Ab-1 (Clone 4C4.9, dilution of 1 in 100) , PSA (Clone SP29, dilution of 1 in 100) and Ki 67 (Clone SP6, dilution of 1 in 100). The well differentiated keratinizing squamous component as well as some of the spindle shaped cells and

small undifferentiated cells stained positive for Cytokeratin and EMA. PSA immunostaining was focally positive. Tumor cells were negative for both S100 and Desmin. About 40% of all cells stained positive for Ki67.

A diagnosis of sarcomatoid carcinoma of the prostate was made based on the presence of an epithelial component (predominantly squamoid) and a mesenchymallike component (predominantly spindle shaped cells with atypical nuclei [Fig.1]. Both components expressed EMA and pancytokeratinreactivity, however the spindle cell component showed much less reactivity than the epithelial component [Fig.2-4].

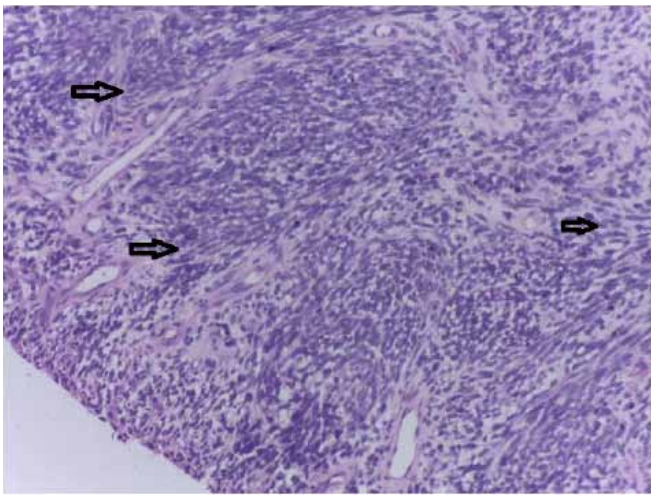

Fig.1: H and E stained section showing predominantly spindle shaped tumour cells at x 100 magnification.

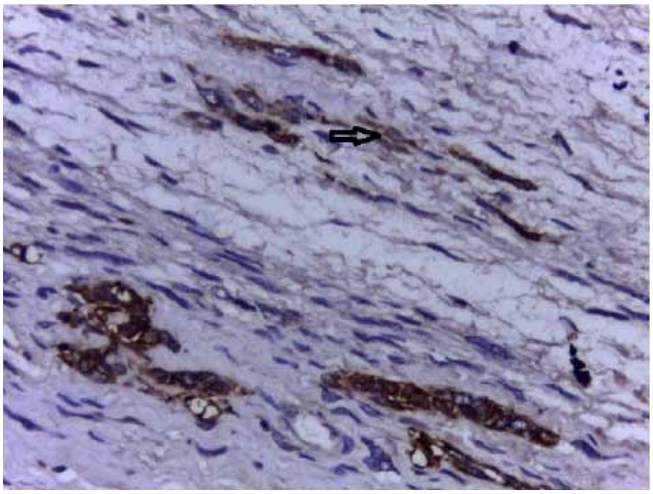

Fig.2: Some of the spindle shaped cells expressing cytokeratin reactivity at x 400 magnification.

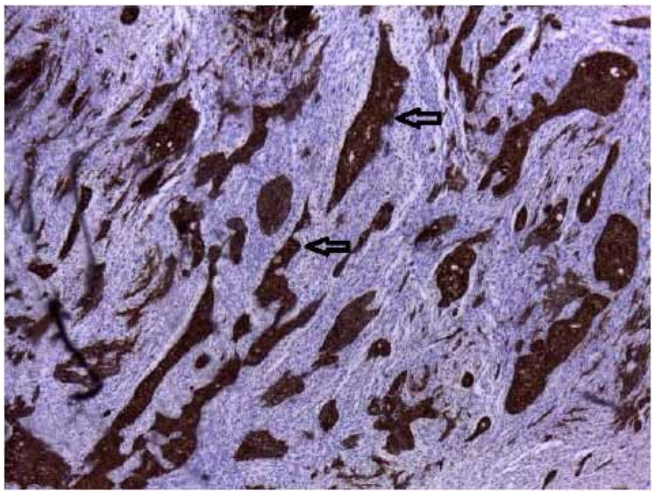

Fig.3: Epithelial component showing strong reactivity for cytokeratin at x 40 magnification.

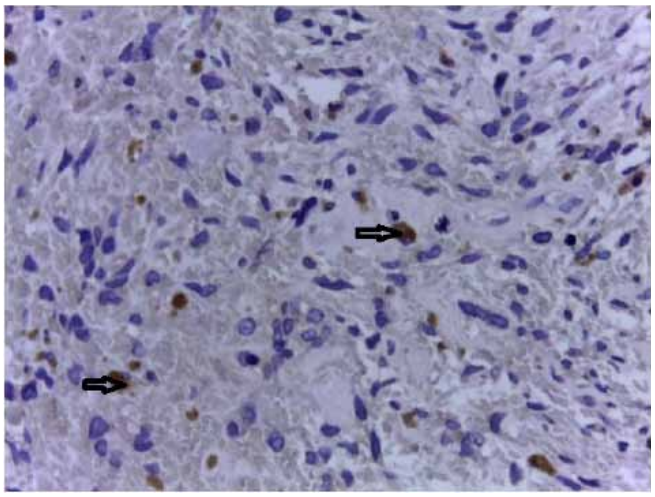

Fig.4: Tumour cells showing focal reactivity for PSA at x 400 magnification.

Discussion

Sarcomatoid carcinoma of the prostate is a rare biphasic malignant neoplasm. We found no report of it in literature from Nigeria, however, a few cases have been reported in other parts of the world [2-7]. It may develop de novo or may be diagnosed after treatment for an initial adenocarcinoma of the prostate. The average age at presentation is 70 years, our patient was 60 years at the time of presentation.

Patients usually present with symptoms of bladder outlet obstruction which include frequency, urgency and nocturia and other less frequent symptoms like haematuria, weight loss, lower abdominal and lower back pain from metastasis [1]. Our patient's clinical presentation was also typical of bladder outlet obstruction. The concomitant finding of a normal serum PSA value and a benign finding on digital rectal examination as well as ultrasound misled our surgeons into making a clinical diagnosis of BPE hence the prostatectomy. Prostatectomy is hardly ever used in the management of prostatic carcinoma in our hospital. This choice of treatment however ensured that we had sufficient tissue to make the diagnosis as sextant core needle biopsy samples may have been insufficient to come to a conclusive diagnosis particularly because there was a paucity of normal glandular epithelium even in the prostatectomy specimen. The focal reactivity for PSA immunostain however confirmed the presence of prostatic tissue, even though almost completely effaced by the tumor cells. The diagnosis of sarcomatoid carcinoma is made by demonstrating both an epithelial and a mesenchymal component microscopically. The epithelial component of the tumor can be an adenocarcinoma, squamous carcinoma, adenosquamous carcinoma or urothelial carcinoma [1] while the mesenchymal like or mesenchymal component can be undifferentiated appearing as sheets of spindle shaped cells. This mesenchymal component may also resemble osteosarcoma, chondrosarcoma or rhabdomyosarcoma [3,6]. Immunohistochemistry usually shows an epithelial component staining positive for EMA and/or cytokeratin while the sarcomatoid component stains positive for Vimentin. Staining of the sarcomatoid component with cytokeratin (as seen in our patient's tumor) suggests development from a single omnipotent cell line.

There is no standard treatment plan for sarcomatoid carcinoma because of its rarity [5]. Resectable lesions are removed surgically by prostatectomy and followed by radiation. The prognosis for sarcomatoid carcinoma is poor, about 55.5% of cases do not respond effectively to chemotherapy [6]. In a study that was carried out by Shannon *et al.*, in 2006 twelve cases of sarcomatoid carcinoma of the prostate were reviewed [3]. Three of the patients were diagnosed de novo and the remaining nine were diagnosed after they had received treatment for adenocarcinoma of the prostate. Ten out of these cases had metastasis to distant sites, the bone being the most common site. Nine of these patients died of the disease, six out of these nine having died in less than 2 years of diagnosis. Our patient also showed clinical features suggestive of metastasis (to the pleura), he however defaulted and was lost to follow up.

Conclusion

Sarcomatoid carcinoma of the prostate is a highly aggressive tumor with poor prognosis. It is recommended that all cases of prostatic adenocarcinoma should be closely monitored by managing physicians to ensure that those cases that transform following treatment of prostatic adenocarcinoma are promptly diagnosed.

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