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Case Report

Foamy Gland Adenocarcinoma with High-Grade Prostatic Intraepithelial Neoplasia (HGPIN) Lesion on TRUS Core Needle Biopsy: A Rare Pathological Variant

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Abstract: Foamy gland carcinoma is a variant of prostatic acinar adenocarcinoma characterized by abundant, foamy cytoplasm, frequently showing small, pyknotic nuclei. Foamy gland carcinoma may be deceptively benign appearing and missed on needle biopsy. Most foamy gland carcinomas are Gleason score 6 or 7, although Gleason score 8-10 carcinomas have been reported. Its occurrence is extremely rare. Prognosis depends on the Gleason score and the presence or absence of perineural or extra prostatic extension. Treatment modalities of foamy gland adenocarcinoma are a similar to that of usual acinar adenocarcinoma. We report an extremely rare case of foamy gland adenocarcinoma of the prostate associated with high-grade prostatic intraepithelial neoplasia lesion on TRUS core needle biopsy in a 78-year-old man presented with history of lower urinary tract symptoms (LUTS) during the last 6 months. Digital rectal examination: the prostate was enlarged, firm in consistency, non-tender, but with a nodule on its left base. Serum prostate-specific antigen (PSA) was 19 ng/mL. Prostate RMI showed a PIRADS 4 lesion on the left base of the prostate. TRUS-guided core biopsy was performed. Pathology report of the prostate cores found foamy gland adenocarcinoma; Gleason score 9 (4 +5) with presence of high-grade PIN lesion. The Bone scan and chest/abdomen CT scan were unremarkable. There were a significant relief of his LUTS under alpha-blockers. After discussion of all the management options, the patient chose a simple surveillance with a close follow-up for LUTS and PSA every 3months and thereafter acting accordingly.

Keywords: prostate adenocarcinoma, foamy gland carcinoma, HGPIN, Gleason grading system.

1. INTRODUCTION

Prostate cancer (PCa) is the second most commonly diagnosed cancer in men, with an estimated 1.4 million diagnoses worldwide in 2020. A systematic review of autopsy studies reported a prevalence of PCa at age < 30 years of 5% (95% confidence interval [CI]: 3–8%), increasing by an odds ratio (OR) of 1.7 (1.6–1.8) per decade, to a prevalence of 59% (48–71%) by age > 79 years. There is variation in the frequency of autopsy detected PCa between men with different ethnical backgrounds and geographical areas (e.g., 83 in white US males vs. 41 in Japan at age 71–80) [1]. Its incidence has been increasing and the age at detection decreasing with the increase of diagnostic methods, use of prostate-specific antigen (PSA) among the routine controls of those over the age of 50 in particular, and increased awareness of prostate cancer. Most prostate adenocarcinoma cases are conventional Acinar type adenocarcinoma. Although less common, there are also many subtypes of prostatic adenocarcinoma. Foamy gland carcinoma was first defined by Epstein and Nelson in 1996 and is one of the subtypes that cause the most difficulty during diagnosis [2], because they are pseudo benign in histological appearance. Its occurrence is extremely rare. Foamy gland adenocarcinoma is a subtype of acinar type prostatic adenocarcinoma and consists of cells with abundant foamy cytoplasm and a very low nucleus/cytoplasm ratio. There are few studies on foamy gland adenocarcinoma and although there is no difference with conventional acinar type adenocarcinoma in prognostic terms, a Gleason score of 7 has been reported to be more frequent in recent studies

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[3, 4]. The Prostatic intraepithelial neoplasia (PIN)-like carcinoma is also uncommon and a mimic of HGPIN. This subtype is characterized by large, discrete glands with a flat or tufted architecture; the glands are often lined by pseudostratified epithelium displaying elongated hyperchromatic nuclei, which resembles that of ductal adenocarcinoma [5]. We report a case of Foamy gland adenocarcinoma with presence of HGPIN lesion detected by TRUS needle biopsy.

2. CASE REPORT

A 78-year-old man presented with history of lower urinary tract symptoms (LUTS) during the last 6 months. Digital rectal examination: the prostate was enlarged, firm in consistency, non-tender, but with a nodule on its left base. Serum prostate-specific antigen (PSA) was 19 ng/mL. Prostate RMI showed a PIRADS 4 lesion on the left base of the prostate. The TRUS-guided 12 core biopsy & 2 core from suspected zon was performed. Microscopic and immunohistochimical examination of all the biopsy cores was don and showed fused glandular structures with focal cribriform pattern with a Gleason score 9 (4 +5) in C1, C5 and CS (suspected zon) involving >80% of the prostatic cores, It is poorly limited. The cytoplasm is abundant clarified and foamy; with a large cytoplasm and pyknotic nucleus, and undefined nucleoli, and has infiltrating characteristics (Fig 1 & 2), there is Presence of high-grade PIN lesion in CS (suspected zone) and There is no perineural invasion. The Bone scan and chest/abdomen CT scan were unremarkable. There were a significant relief of his LUTS under alpha-blockers. After discussion of all the management options, the patient chose a simple surveillance with a close follow-up for LUTS and PSA every 3months and thereafter acting accordingly.

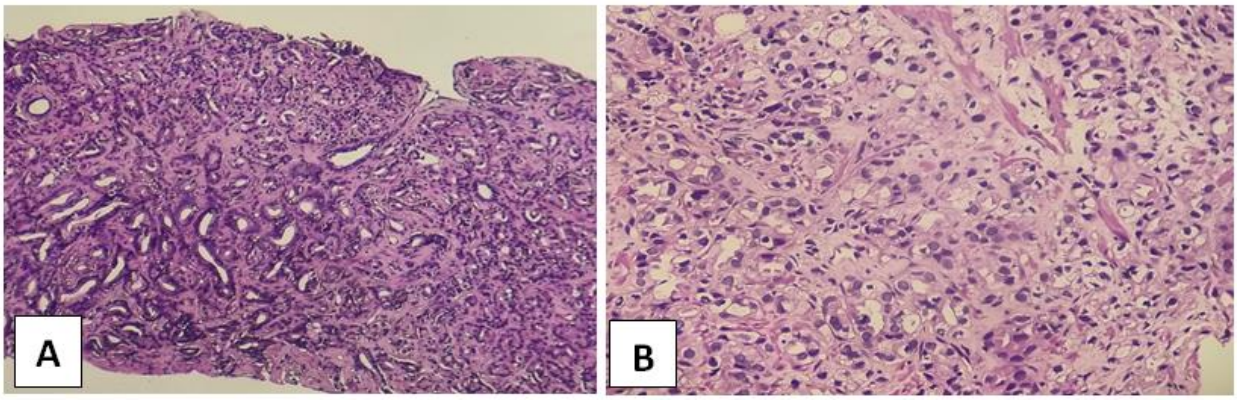

Fig 1: A & B: Prostatic parenchyma showing architectural distortion and abnormal glands with nuclear atypia consistent with the diagnosis of acinar adenocarcinoma

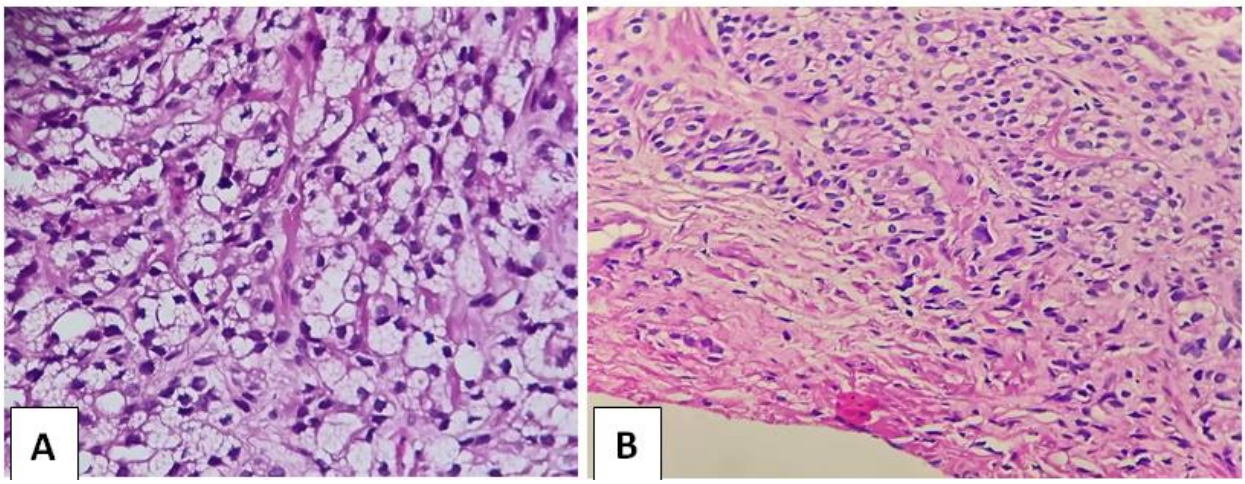

Fig 2: A & B: Foamy cell component: prostate tumor cells with abundant xanthomatous cytoplasm and hyperchromatic nuclei

3. DISCUSSION

Acinar type adenocarcinoma is the most commonly seen carcinoma in the prostate and makes up about 90% of the tumors [6]. The tumor is diagnosed by its infiltrating characteristics, small glandular structure, large nucleus, prominent nucleolus, amphophilic staining cytoplasm, flat cytoplasmic luminal border, mucin in the lumen, collagenous micro nodules (mucinous fibroplasia) and glomeruloid proliferation in the gland [7]. In addition, malignancy criteria are peripheral nerve, periprostatic soft tissue and

angiolymphatic invasion. Although acinar type adenocarcinoma shows the above mentioned histological features in most cases, many histological subtypes have been defined in the recent World Health Organization classification such as : Signet ring-like cell acinar adenocarcinoma; pleomorphic giant cell acinar adenocarcinoma; sarcomatoid acinar adenocarcinoma ; prostatic intraepithelial neoplasia (PIN)-like carcinoma, In addition there are some special morphological patterns: atrophic, pseudohyperplastic, microcystic, foamy gland adenocarcinoma, and mucinous (colloid) [8]. The Prostatic intraepithelial neoplasia (PIN)-like carcinoma is uncommon and a mimic of HGPIN. This subtype is characterized by large, discrete glands with a flat or tufted architecture; the glands are often lined by pseudostratified epithelium displaying elongated hyperchromatic nuclei, which resembles that of ductal adenocarcinoma, in other cases of PIN like carcinoma the neoplastic epithelium is cuboidal, with round nuclei that are more typical of acinar adenocarcinoma. This subtype can be distinguished from HGPIN by the crowding of the glands and the lack of basal cells, and from ductal adenocarcinoma by the absence of true papillae with fibro vascular cores, cribriform glands, and necrosis [5]. Foamy gland carcinoma is a variant of prostatic adenocarcinoma first described by Nelson and Epstein in 1996 [2]. Foamy gland adenocarcinoma shows abundant xanthomatous cytoplasm and often has pyknotic nuclei lack in characteristic macronucleoli of typical acinar adenocarcinoma for these reasons it may be mistaken for benign glands or even macrophages and makes it difficult to identify these lesions in needle core biopsy materials especially when they are well differentiated. Immunohistochemical markers are therefore needed in the diagnosis of pure foamy gland carcinoma especially when there is only a small number of a gland in only a few cores. The foamy appearance is caused by the presence of numerous intracytoplasmic vesicles, which lack lipid or neutral mucin. Most foamy gland carcinomas are Gleason score 6 or 7, although Gleason score 8-10 carcinomas have been reported [9], like in our case which is Gleeson 9 (4+5). International Society of Urologic Pathology (ISUP) recommends grading of these carcinomas based on the underlying architectural pattern [10]. Prognosis depends on the Gleason score and the presence or absence of perineural or extra prostatic extension.

4. CONCLUSION

Foamy gland adenocarcinoma with HGPIN lesion is an unusual variant, due to its benign-appearing architecture and its small pyknotic nuclei. It is important for the pathologist to be aware of this entity as foamy gland carcinoma in pure form can be easily missed on needle biopsy. Most foamy gland carcinomas are Gleason score 6 or 7, although Gleason score 8-10 carcinomas have been reported like in our case. Prognosis depends on the Gleason score and the presence or absence of perineural or extra prostatic extension. Treatment modalities of foamy gland adenocarcinoma are a similar to that of usual acinar adenocarcinoma.

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