Ductal adenocarcinoma of the prostate: A clinicopathological study

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Abstract

Objective To study the clinicopathological features of ductal adenocarcinoma of the prostate (DAP).

Materials and method All patients with DAP treated in a single urological unit of a tertiary referral center for a period of 12 years and 4 months from September 1996 to December 2008 were analyzed. The median follow up was 78 days (range 20 - 391 days).

Results 16 patients with DAP (pure ductal – 7, mixed ductal-microacinar – 9) were treated during the study period. The median age of the patient was 69 years (range 56–87 years). During the last 33 months of the study period DAP accounted for 7.2% (pure ductal – 3.6%, mixed ductal-microacinar – 3.6%). Of all DAP four patients had haematuria as the presenting symptom. Digital rectal examination revealed a clinically malignant prostate in 13 patients. Serum PSA varied from 3.26 ng/ml to 311 ng/ml. Urethroscopy revealed papillary growths around the verumontanum or inside the prostatic urethra in 6 patients. 4 patients were surgically castrated and one patient received external beam radiation for the control of disease. Watchful waiting was offered for 3 patients.

Conclusion DAP in pure or mixed form accounted for 7.2% of all prostatic carcinomas; 25% of patients presented with haematuria which is an unusual presentation for prostatic microacinar adenocarcinoma.

Introduction

The vast majority of prostatic carcinomas are microacinar adenocarcinomas. Unusual histological types (variants) of prostatic carcinoma such as ductal adenocarcinoma, squamous cell and adenosquamous carcinoma, urothelial carcinoma, small cell carcinoma, carcinosarcoma and basal cell carcinoma account for about 5-10% of carcinomas that originate in the prostate gland. Among the unusual histological variants, ductal adenocarcinoma is the most common histological variant (1,2,3,4,5,6). DAP is an aggressive tumour with a worse prognosis (3). The best form of treatment is still controversial. This study describes the clinicopathological features of a series of patients with DAP.

Materials and method

The records of all patients with DAP treated in a single urological unit of a tertiary referral center for a period of 12 years and 4 months from September 1996 to

December 2008 were analyzed. The data were obtained retrospectively from clinical case notes, operation register and pathology files. In all patients, the specimen for histological diagnosis was obtained either by transrectal core biopsy of prostate or TURP. The median follow up was 78 days (range 20=391 days).

Results

Sixteen patients with DAP were identified; of which seven had pure ductal carcinoma whilst 9 had mixed ductal-microacinar carcinoma. The clinicopathological features are shown in Table 1. The median age of patient at presentation was 69 years (range 56–87 years). During the last 33 months of the study period DAP accounted for 7.2% (pure ductal – 3.6%, mixed ductal-microacinar – 3.6%). Patient no. 4 who had undergone surgical castration for metastatic prostate cancer (unknown histology) was found to have ductal adenocarcinoma after 10 years and 4 months. Similarly patient no. 11 who had undergone surgical castration

for metastatic prostate cancer (unknown histology) was found to have mixed ductal-microacinar adenocarcinoma after 1 year and 8 months. In patient no. 10 mixed ductal-microacinar adenocarcinoma changed to pure ductal adenocarcinoma after 3 months of watchful waiting. Four patients had haematuria as a presenting symptom. Digital rectal examination revealed clinically malignant prostate in 13 patients. Serum PSA level varied from 3.26 ng/ml to 311 ng/ml. Urethroscopy revealed papillary growths around the verumontanum or inside

the prostatic urethra in six patients. Five out of nine patients with mixed ductal-microacinar adenocarcinoma had a Gleason sum score of 9/10. Four patients were surgically castrated and one patient received external beam radiation for the control of disease. Watchful waiting was offered for 3 patients. Surgical castration gave good biochemical response in patient no. 3 (serum PSA 0.172 ng/ml after 2 months). But there was no similar response in patient no. 14 (serum PSA 63.5 ng/ml after 2 months).

Table 1. Clinicopathological data of patients with DAP

Patient no.	Age (yrs)	Histology	Gleason sum score for microacinar component	Presentation	DRE	Serum PSA ng/ml	Unusual ureteroscopic findings	Treatment	Follow up since diagnosis
1	70	PD	-	Poor stream Hx	M	4.7	Papillary growth near the verumontanum	Watchful waiting	27 days
2	65	PD	-	AUR	M	NA	Rigid prostatic urethra	Surgical castration	1 yr
3	67	PD	-	Nocturnal enuresis (CUR)	M	311	-	Surgical castration	78 days
4	80	PD	-	Poor stream	NA	NA	Distorted prostatic urethra, extensive papillary growth on lateral wall of prostatic urethra	*	-
5	75	PD	-	AUR	M	3.26	Distorted prostatic urethra	External beam RT	1yr & 26 days
6	65	PD	-	AUR	E	20	Distorted prostatic urethra with fragile papillary growth	-	-
7	72	PD	-	AUR	M	NA	-	-	-

8	87	MDA	4a + 5b	AUR	M	168	-	Surgical castration planned	29 days
9	68	MDA	5b + 5b	Poor stream	M	41.2	Ulcerated left lateral lobe, papillary growth extruded during resection	Surgical castration planned	28 days
10	65	MDA	3a + 3a	Painful voiding	M	47.9	Distorted prostatic urethra	Watchful waiting	6 months
11	63	MDA	3a + 4a	Poor stream	M	25.5	Rigid prostatic urethra	'conservative'	7 months
12	80	MDA	3a + 3a	Hx	NA	40	Papillary growth in the prostatic urethra	Watchful waiting	41 days
13	75	MDA	4a + 5b	Hx, AUR	M	NA	-	Surgical castration planned	30 days
14	56	MDA	3a + 3a	Hx	M	39.8	Distorted prostatic urethra	Surgical castration	5.5 months
15	84	MDA	4a + 5b	Poor stream	M	59.7	-	Surgical castration	4 months
16	66	MDA	4a + 5b	Poor stream	M	61.3	Rigid distorted prostatic urethra with papillary growth near verumontanum	Surgical, castration planned	20 days

PD – pure ductal, MDA – mixed ductal-microacinar, Hx – haematuria, AUR – acute urinary retention, CUR – chronic urinary retention, M – malignant, E – equivocal, NA – not available

Discussion

Ductal adenocarcinoma is the most common unusual histological variant of prostatic carcinomas. In the largest published series of DAP (262 patients), the incidence of pure ductal adenocarcinoma was 1.3%, while the incidence or proportion of mixed ductal-microacinar adenocarcinoma was 4.8% (1). In this study the proportion of pure ductal adenocarcinoma was higher; 3.6%.

The median age of patients in our study (69 years) is within the median age published (63-72 years) in other series (5,7).

Although haematuria is a rare presenting symptom in patients with microacinar adenocarcinoma, 4 out of 16 patients in our series presented with this symptom. Other studies have also shown similar feature (5,7).

Ductal adenocarcinomas are usually centrally located, but can be isolated in the peripheral zone. Centrally located ductal adenocarcinomas are often exophytic and protrude into the prostatic urethra around the verumontanum. Intraductal tumours may spread throughout the entire prostate gland. Peripherally located tumours typically show white-grey firm appearance similar to acinar adenocarcinoma. Intraductal spread (permeation) throughout the entire prostate gland in centrally located tumour and the presence of tumour in the peripheral zone account for high frequency of digital rectal examinations that are suspicious for malignancy (1,5,7). In this study majority (13 patients) had a digital rectal examination which was suspicious for malignancy. Most patients with DAP have an elevated serum PSA above 4 ng/ml (5,7). The serum PSA level varied from 3.26 ng/ml to 311 ng/ml in this study.

Urethroscopically there can be exophytic papillary/polypoid growths protruding into the prostatic urethra around the verumontanum in many cases of DAP. The prostatic urethra can also appear narrowed, nodular, irregular or normal. In this study urethroscopy revealed papillary growths around the verumontanum or inside the prostatic urethra in 6 patients.

The histological grade of ductal adenocarcinoma is usually high grade Gleason pattern 4, but uncommonly pattern 3 and 5 can be seen (8). Some authors are of the opinion that mixed ductal-microacinar adenocarcinoma should be given a combined Gleason score similar to pure microacinar adenocarcinoma. In our study the microacinar component was graded independently and the large duct component was not assigned a grade.

DAP is aggressive; the outcome for men with DAP is, in most studies worse than the outcome for men with microacinar adenocarcinoma of prostate. Survival and response to treatment appear to be related to stage which is more often advanced for ductal adenocarcinoma than that of microacinar adenocarcinoma. 25-40% of patients with ductal adenocarcinoma have metastasis at the time of diagnosis. The 5 year survival rate is 15-43% (3,5,7). Androgen deprivation therapy may provide palliative relief even though this cancer is less hormonal responsive than microacinar adenocarcinoma (3). Some patients respond to radiotherapy (9) and radical prostatectomy (3). Cueva, et al, described a patient who failed to respond to oestrogen therapy, but had a remission with estramustine phosphate (10). We are unable to comment on prognosis as there was no long term follow up data.

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