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Original Research Article

Histopathological Analysis of Bilateral Orchiectomy Specimens in Prostatic Adenocarcinoma

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Abstract

Introduction: Prostatic adenocarcinoma is one of the most frequently diagnosed cancer in adult males which seldom metastasizes to testis. ***Method*:** In current study the authors retrospectively analysed the 154 cases of bilateral orchiectomy done as hormonal ablation therapy in cases of prostatic adenocarcinoma. ***Result:*** We received a total 154 bilateral orchiectomy specimens of patients with prostatic adenocarcinoma in the period of three years. The Patients presented were from 42-86 year of age with a mean age of 60 years. In most (83.11%) of the cases testes were atrophied, 15.58% cases presented with normal histology and only two cases (1.30%) were reported positive for metastasis in testicles. Interestingly both of our cases also had a low PSA level. ***Conclusion:*** Testicular atrophy is the most common histopathological finding in patients of bilateral orchiectomy done for prostatic adenocarcinoma. Testicular metastasis is very rare but its possibility highlights the need for continued monitoring of patients with a history of prostatic cancer for local recurrences as well as metastatic disease. It also shows the importance of detecting metastasis to rare locations such as testicles specially in the setting of low PSA levels.

Keywords: Prostatic adenocarcinoma, testicular metastasis, Low PSA level.

INTRODUCTION

Prostatic adenocarcinoma is one of the most frequently diagnosed cancer in adult males. The most common sites of the metastases are pelvic lymph nodes, bones, lungs and very rarely it can metastasizes into testis, breast, CNS or skin [1]. Metastasis in testis is generally seen incidentally in orchiectomy specimens performed for hormonal deprivation therapy with an incidence rate of about 2-4% [2]. Fewer than 200 cases of testicular metastases are reported worldwide till date. Metastasis is usually unilateral, however bilateral metastasis is also reported [3, 4].

Suppression of endocrine testicular function is the mainstay of treatment in advanced stage or metastasized prostatic carcinoma. Huggins and Hodges showed in 1941 that there is no better way to achieve temporary control of cancer growth than androgen deprivation [5].

Androgen deprivation can induce a remission in 90% of prostatic carcinoma patients, the median progression free survival ranges from 18 to 34 months [6].

The earliest method of androgen deprivation is the bilateral epididymal sparing orchiectomy which is the definitive treatment for the patient. Despite the fact that bilateral orchiectomy is a proven method which shows excellent oncological efficiency, rapid onset of action, 100% compliance and minimal side effects, priority is given to medical treatment [7].

Most of the patients with bilateral orchiectomy for prostatic adenocarcinoma present histopathologically with testicular atrophy possibly due to prior medical castration or senile changes, few cases show histologically normal testis and testicular metastasis is found rarely.

Present study is done to analyse the histopathological findings in bilateral orchiectomy specimens in patients with prostatic adenocarcinoma and to detect the incidence of testicular metastasis in prostate cancer.

AIMS AND OBJECTIVE

1. To study histopathologic findings in bilateral orchiectomy specimens in patients with prostate cancer.
2. To calculate incidence of testicular metastasis from prostate carcinoma.
3. To determine prevalence of testicular atrophy in bilateral orchiectomy specimens in patients with prostatic adenocarcinoma.

MATERIAL AND METHOD

The present study was carried out in the department of pathology, Sardar Patel Medical College, Bikaner. Bilateral orchiectomy specimens of patients with histopathologically proven prostatic adenocarcinoma were included in the study. Orchiectomy done for causes other than prostatic cancer were excluded. The orchiectomy specimens were processed as per norms and gross and microscopic findings were noted. Criteria studied were age, histopathological diagnosis and degree of atrophy. Testicular atrophy cases were graded as follows- grade 0 being normal seminiferous tubules with adequate thickness of the spermatogenic cells and normal sperm production. Grade 1 was defined as decreased thickness of spermatogenic cells and decreased sperm production. Grade 2 means atrophic changes of tubules with <2 layers of spermatogenic cells. Grade 3 was defined as marked atrophic changes with no visible spermatogenic cells.

OBSERVATION AND RESULTS

We received a total 154 bilateral orchiectomy specimens of patients with prostatic adenocarcinoma in the period of three years. The Patients presented were from 42-86 year of age with a mean age of 60 years.

In most (83.11%) of the cases testes were atrophied, 15.58% cases presented with normal histology and only two cases (1.30%) were reported positive for metastasis in testicles (Table-1).

Table-1: Histopathological findings in bilateral orchiectomy specimens

Histopathological finding	No. of cases	Percentage
Normal testicular histology	24	15.58
Testicular atrophy	128	83.11
Testicular metastasis	2	1.30
Total	154	100

Atrophic testis presented grossly with normal testicular architecture but microscopically two specific findings were noted- basement membrane thickening around seminiferous tubules with reduced/absent spermatogenic cells and interstitial cell hyperplasia (Fig 1 & 2).

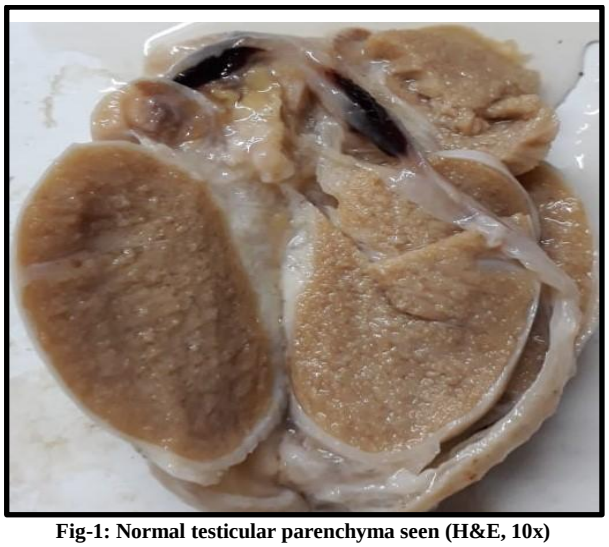

Fig-1: Normal testicular parenchyma seen (H&E, 10x)

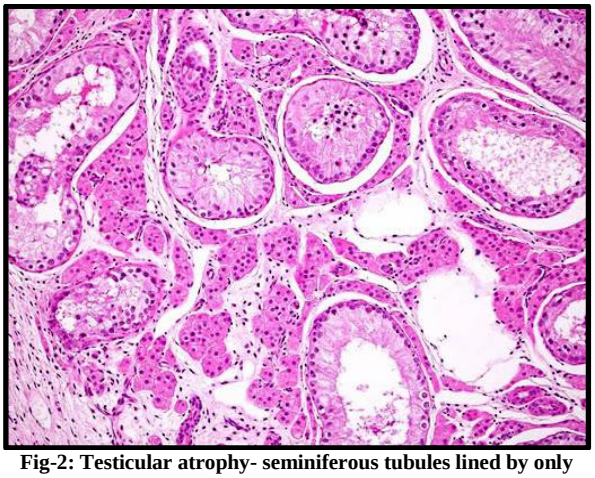

Fig-2: Testicular atrophy- seminiferous tubules lined by only sertoli cells and leydig cell hyperplasia (H&E, 10x)

Total 128 cases presented with testicular atrophy in which 73.44% showed grade 1 atrophy, 21.88% showed grade 2 atrophy and 4.69% presented with grade 3 atrophy (Table-2).

Table-2: No. of cases in different grades of atrophy

Testicular atrophy	No. of cases	Percentage
Grade 1 atrophy	94	73.44
Grade 2 atrophy	28	21.88
Grade 3 atrophy	6	4.69
Total	128	100

Interestingly, both cases being reported in the present study with metastasis of prostatic adenocarcinoma had low serum PSA levels of 4.33 ng/ml and 5.8 ng/ml respectively. One of the cases presented with metastatic growth grossly and gleason score 8 (4+4) on microscopy (Fig 3 & 4). Another case presented with normal testicular tissue grossly and gleason score 7 (3+4) on microscopy.

Fig-3: Testicular metastasis- well circumscribed (H&E 10x)

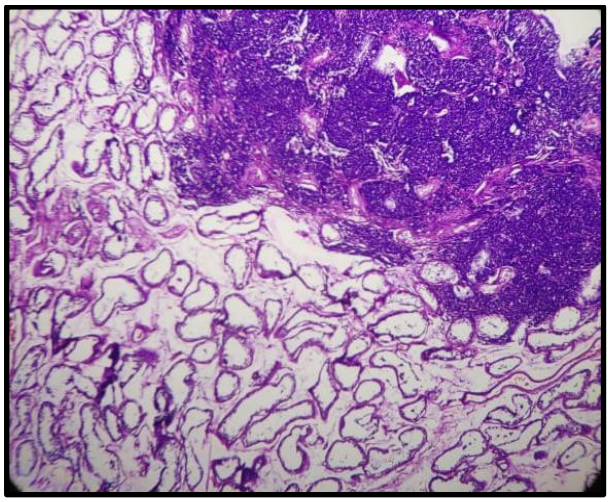

Fig-4: Testicular metastasis-lobular bulging grey white growth m/s 2.5x2.5cm. growth with areas of normal testicular architecture (H&E 10x)

DISCUSSION

Most of the patients with prostatic adenocarcinoma undergoing bilateral orchiectomy present with variable degree of testicular atrophy and metastasis to testis is very rare in these cases.

In this study, the majority of our patients (83.11%) had testicular atrophy which is almost comparable to other studies. Testicular atrophy changes are probably due to medical hormone ablation therapy and some are due to age related changes. Testicular atrophy is characterised by basement membrane thickening surrounding the atrophic tubules showing reduced number of spermatogenic cells and leydig cell hyperplasia.

Secondary malignant testicular tumors are rare except hematologic malignancies such as leukemia or lymphoma because testis does not represent a suitable environment for establishment and growth of the secondary tumour due to relatively low scrotal temperature [8]. Blood testis barrier also offers some protection. In our study testicular metastasis was found only in 1.30% cases which is almost similar to other studies. Bubendrof et al studied a total of 1589 cases of prostatic adenocarcinoma and found testicular metastasis only in 0.5% cases [9]. The first such case was published in 1938 by Semans [10]. Till now only 200 cases are reported.

The mechanism for this rare metastasis is thought to be retrograde venous extension or embolism, arterial embolisation, lymphatic extension and endo canalicular spread [11, 12].

Most of the secondary testicular tumours are discovered accidentally by prophylactic orchiectomy [13]. Primary tumors are generally found in prostate, lung, kidney stomach or skin in these cases.

Usually prostatic carcinomas which present with metastasis have high PSA value but both our cases had low PSA levels which makes them quite interesting.

CONCLUSION

Testicular atrophy is the most common histopathological finding in patients of bilateral orchiectomy done for prostatic adenocarcinoma. Testicular metastasis is very rare but its possibility highlights the need for continued monitoring of patients with a history of prostatic cancer for local recurrences as well as metastatic disease. It also shows the importance of detecting metastasis to rare locations such as testicles specially in the setting of low PSA levels.

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