

Histopathological Study of Bilateral Orchidectomy Specimen In Patient With Prostate Cancer

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Abstract

Main stay of treatment of advanced prostate cancer worldwide is androgen ablation with bilateral orchidectomy or medical castration. Present study is done to determine histopathology finding in patient with advanced prostate cancer who had undergone bilateral orchidectomy. Total 76 bilateral orchidectomy specimens were enrolled in the 2 year study. On histopathology examination of these specimens 63(82.89%) cases showed testicular atrophy, 12(15.78%) case showed normal histological testes and only 1(1.3%) case show evidence of testicular metastases from prostate cancer. In conclusion testicular atrophy is most common histological finding in bilateral orchidectomy specimen in patient with advanced prostate cancer and testicular metastases is a rare incidental finding.

Keywords: bilateral orchidectomy, prostate cancer, testicular atrophy, testicular metastases

Introduction

Prostatic adenocarcinoma is one of the commonest malignancies afflicting the adult male population. The favored sites of metastasis of prostatic cancer are the

bone, liver and lungs.[1] Prostatic adenocarcinoma rarely metastasizes to testis and is incidentally detected in orchidectomy specimens performed for hormonal deprivation therapy with an incidence rate of about 2-4%.[2]Metastases are usually unilateral, however, bilateral metastases are also documented.[3,4]

Suppression of endocrine testicular function represents the gold standard in palliative treatment in advanced stage or metastasized Prostate Ca. Already in 1941, Huggins and Hodges demonstrated control of Prostate Ca growth rate by androgens and showed that there is no better way to achieve temporary control of Prostate Ca growth than androgen deprivation (AD) [5]. Basically, AD treatment is able to induce a remission in 90% of Prostate Ca patients; the median progression-free survival ranges from 18 to 34 months [6]. The earliest method of AD is represented by the bilateral orchidectomy, usually bilateral epididymal-sparing orchidectomy, which means a definitive therapy for the patient.

Despite the fact that bilateral orchidectomy represents a proven method showing excellent oncological efficiency with rapid onset of action, 100% compliance of surgical

castration due to the definite character, and just minimal side effects, at present, priority is given to medical treatment [7]. Most of the patients with bilateral orchidectomy done for prostate cancer in histopathologic examination shows testicular atrophy which possibly either due to prior medical castration or may be age related, few cases show histological normal testes and testicular metastases detected incidentally.

Present study is done to study histopathological findings of bilateral orchidectomy specimen in patient with prostate cancer and to detect incidence of testicular metastasis of prostate cancer.

Aims And Objective

1. To Study histopathologic finding of bilateral orchidectomy specimen in patient with prostate cancer.
2. To calculate incidence of testicular metastasis from prostate cancer.
3. To determine prevalence of testicular atrophy in bilateral orchidectomy specimen in patient with prostate cancer.

Material and Methods

The present study carried out in department of pathology, Sardar Patel Medical College Bikaner. Patients with histologically diagnosed prostate cancer had bilateral orchidectomy as their management was included in the study. The orchidectomy specimens were studied by experienced pathologists and the reports were analyzed both prospectively and retrospectively. Orchidectomy done for cause other than prostate cancer was excluded from study. The criteria evaluated were: age, histological diagnosis, and the degree of atrophy per predetermined histological criteria. A total of 76 specimens were received in 2 year.

After receiving, Specimens were placed in 10% formalin solution for gross and microscopic pathological analyses.

Gross examination of fixed specimen is done and Slides are stained using routine Haematoxylin & Eosin stain and then mounted with DPX. The testes were then classified as being normal, mildly, moderately or severely atrophic on the basis of microscopy finding.

Grading system of the histopathological results of atrophic changes in the seminiferous tubules was defined by the urologists and uropathologist. Four grades were classified according to atrophic changes in the seminiferous tubules. Grade 0(normal) was defined as a grossly normal seminiferous tubule with adequate thickness of the spermatogenic cells with sperm production. Grade I(mild) was defined as decreased thickness of the spermatogenic cell layers and decreased sperm production by the seminiferous tubules. Grade II(moderate) was defined as atrophic changes of the seminiferous tubules with fewer than two layers of spermatogenic cells. Grade III(severe) was defined as marked atrophic changes in the seminiferous tubules with no visible spermatogenic cells. The pathological findings were recorded.

Observations and Result

Total 76 patient with bilateral orchidectomy for prostate cancer were studied in 2 year .

| S. No. | Histological Finding | Case No. | Percentage (%) |
|--------|--|----------|----------------|
| 1. | Normal Histological Testes | 12 | 15.78% |
| 2. | Mild Atrophic Changes | 46 | 60.52% |
| 3. | Moderate Atrophic Changes | 15 | 19.73% |
| 4. | Severe Atrophic Changes | 2 | 2.6% |
| 5. | Testicular Metastases Of Prostate Cancer | 1 | 1.31% |

| | | | |
|--|-------|----|------|
| | Total | 76 | 100% |
|--|-------|----|------|

Table no 1 showing histological finding of bilateral orchidectomy specimen and their percentage



Figure 1 showing gross specimen of bilateral orchidectomy

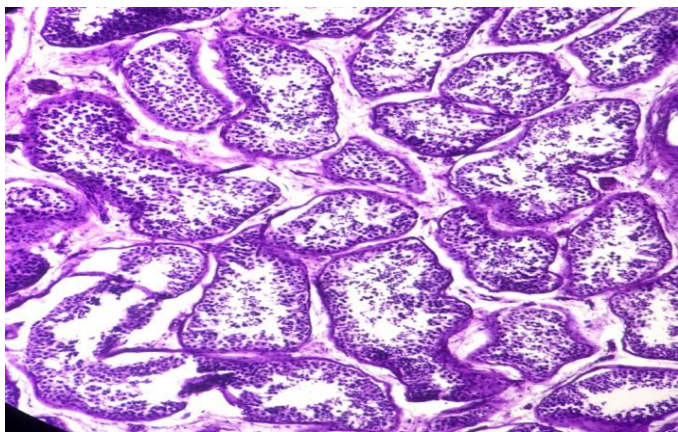


Figure 2 H&E stain 10x view showing normal seminiferous tubules having spermatogenesis

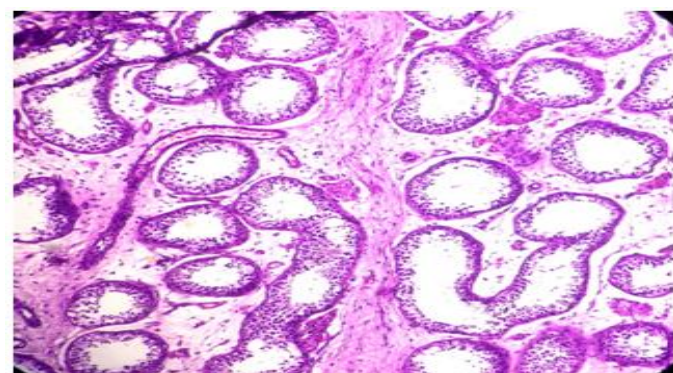


Figure 3 H&E stain 10x view showing reduced spermatogenesis, mild atrophic changes.

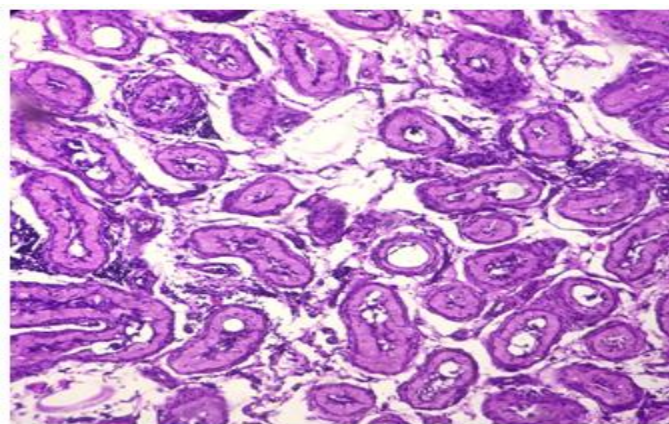


Figure 4 H&E stain 10x view showing complete sclerotic tubules, thickening of basement membrane- severe atrophic changes

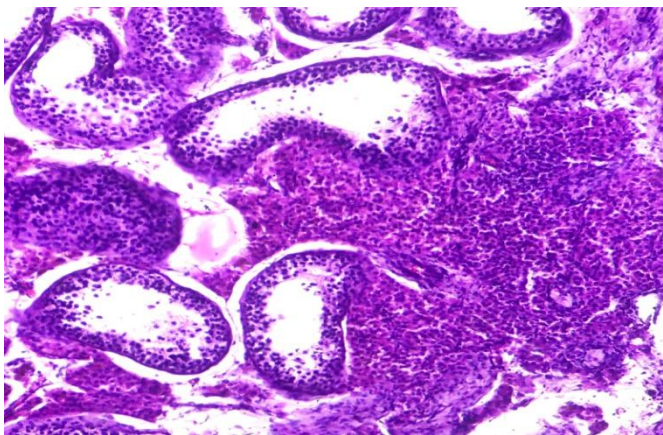


Figure 5 H&E stain 10x view showing interstitial cell hyperplasia

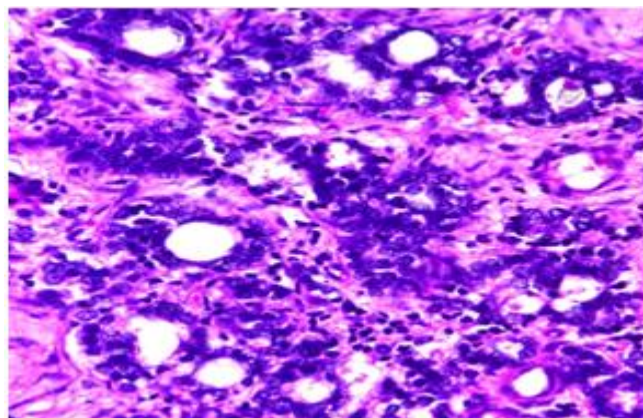


Figure 6 H&E stain 10 x view showing malignant cells around seminiferous tubules and in clusters.

Average age of patient with bilateral orchidectomy recorded was 58 yrs. Minimum age reported was 37 and maximum was 87 yrs. In histopathologic examination only one patient (1.31%) had evidence of testicular metastasis while 63 (82.89%) patients showed evidence of testicular atrophy and only 12 (15.78%) patients showed evidence of normal testes histologically as shown in figure 2.

Out of 63 specimens reported as atrophic, 46(73.01%) showed mild atrophic changes as shown in figure 3 and 15 (26.9%) showed moderate to severe atrophic changes as shown in figure 4. Two specific findings were recorded on reviewing of specimen: basement membrane thickening shown in figure 5 and interstitial cell hyperplasia shown in figure 6. Original dominating cell in interstitial area should be leydig cell and these hypertrophic cells were histologically similar to leydig cells. Basement membrane thickening was noted around seminiferous tubule and was usually associated with significant histological atrophic changes in seminiferous tubules. In one case testicular metastasis showed metastasis from prostate cancer in only one testes while other testes showed atrophic and sclerotic changes. Malignant cells were seen in interstitium in small nests and groups among seminiferous tubules in testes with metastatic changes as shown in figure 6. Malignant cells were round to oval, scanty to moderate amount of cytoplasm and had prominent nucleoli.

Discussion

Majority of bilateral orchidectomy specimens in patient with prostate carcinoma show variable degrees of atrophy whilst testicular metastases are rare. In the present study testicular atrophy detected in 82.89 percent cases which is almost comparable to other previous studies. Testicular atrophy changes were possibly due to prior hormonal ablation with medical therapy or may be due to age

related. Hwang et al[8] reported in their study that histological finding in specimen with prior medical castration shows profound atrophic changes in seminiferous tubules, thickening of basement membrane, fibro sclerotic changes and interstitial cell hyperplasia .

E Oluwabunmi Olapade-Olaopa studied on histology of orchidectomy specimen in patient with prostate cancer and reported Two (2) specimens (1.4%) had evidence of testicular metastases while 106 (74.6%) showed evidence of testicular atrophy and 34 (23.9%) of the specimens were reported as normal testes. Of the 106 specimens reported as atrophic, 33 (23.2%) showed mild atrophic changes and 73 (51.4%) showed moderate to severe atrophic changes[9].

Testis is a rare site for involvement by secondary malignancies with the reported incidence being about 0.06-2.5% as seen at autopsy or as an incidental finding after therapeutic orchidectomy.[1,2] in the present study testicular metastases reported in one percent case which is almost similar to other studies. Bubendorf et al, in the series of 1589 patients with the prostate carcinoma, showed that 35% of the patients had hematogenous metastases, mostly in bones (90%), the lungs (46%) and the liver (25%), while the metastases in the testis were found only in 0.5% of the cases [10]. The first case of the prostate carcinoma with metastases into a testis was published by Semans in 1938 [11]. In the previous publications, less than 200 cases with testis metastases have been mentioned [12]. The testicular microenvironment is not conducive to the establishment and growth of secondary tumors owing to relatively low temperature of scrotum [13]. The mechanism for metastasis of prostate cancer to the testis has been proposed to include retrograde venous extension or embolism, arterial embolization, lymphatic extension and endocanalicular spread [14,15].

The most common tumors metastasizing to testis included lung, melanoma, prostate and kidney.[1,2] However, in recent studies, prostate cancer has been the commonest primary site.[16,17] This increased detection may be related to the therapeutic orchidectomies these patient undergo. In the present case also the metastasis was an incidental finding observed at orchidectomy done for androgen ablation [4].

This study has limitations. The case number of this study was small, and the study design was retrospective so history of prior medical castration was not known. So confirmed effect of medical castration on testicular histology could not be detected. Since the specimens were fixed with formalin, and haematoxylin and eosin staining was used, the enzyme activities of the cells could not be checked such as 3β hydrosteroid dehydrogenase. In addition, we did not fix the specimens in Bouin's solution, since this method is not a routine fixation procedure in our institution.

Conclusion

To conclude testicular atrophy is most common histological finding in patient with bilateral orchidectomy done for prostate cancer. Testicular metastasis is a rare finding in patient with prostate cancer.

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