

# Histological Spectrum of Non-Malignant Lesions of Prostate

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**Abstract:** Background and objectives: Study of prostatic lesions has gained more importance because development of prostatic hyperplasia is an almost universal phenomenon in ageing men that account for considerable morbidity. Inflammatory conditions need correct diagnosis as they can be treated with antibiotics. Methods: 295 cases of non-malignant prostatic lesions were included in the present study and were grouped into inflammatory conditions and benign lesions. Results: Most of the patients were in sixth decade. The most common lesion encountered was nodular hyperplasia followed by nodular hyperplasia with prostatitis. Interpretation and conclusion: Nodular hyperplasia was the common lesion encountered. Associated lesions like chronic nonspecific prostatitis, basal cell hyperplasia and prostatic abscesses were also encountered.

**Keywords:** Basal cell hyperplasia, chronic non-specific prostatitis, nodular hyperplasia, prostatic abscesses, prostatic hyperplasia.

## 1. Introduction

The prostate is a retroperitoneal organ encircling the neck of bladder and urethra. Enlargement of the prostate leads to problems that are related to urinary obstruction. Prostatitis and Nodular hyperplasia are the important non-malignant lesions of prostate to be studied in detail as they are frequently encountered. Nodular hyperplasia describes a hyperplastic process of stromal and epithelial elements of prostate. It is an extremely common problem in elderly men usually over the age 50.

## 2. Aims and Objectives

**2.1:** To determine the age distribution of patients among the non-malignant lesions of prostate

**2.2:** To study their clinical presentations

**2.3:** To study the histological spectrum of various non-malignant lesions of prostate

## 3. Materials and Methods

The study covered 370 prostatic specimens received in the department of Pathology of our institution during the period of 4 years, from May 2011 to May 2015. The material included prostatic needle biopsies and transurethral resection of prostate [TURP] chips. But the study included only 295 prostatic specimens, which are proved to be non-malignant under light microscopy.

In cases of prostatic needle biopsies, entire tissue received was fixed and processed. In cases of TURP chips, 3 to 4 cassettes were prepared in each case accommodating the total tissue and weighed approximately 8-10 grams. Specimens weighing less than or equal to 12 grams were submitted entirely. In cases of excess material one additional

cassette for each additional 10 grams of tissue was prepared. Random chips were submitted for processing. All the tissues were fixed in 10% buffered formalin and paraffin embedded. 3 to 5 micron sections were cut and stained with routine Hematoxylin and Eosin (H & E) stain. All the slides were thoroughly evaluated for histological features.

## 4. Results

The present study included 295 prostatic biopsy specimens out of 370 prostatic specimens received in the in our institution over a period of 4 years from May 2011 to May 2015, with the incidence of non-malignant lesions being 79.7%. The age group included in the present study ranged from 41 - 93 years. Majority of the cases showed nodular hyperplasia and were seen in the age group of 60 to 69 years constituting to 42.03% of the total cases (TABLE-1) with the mean age of 66 years. Frequency of urination was the most common presenting symptom in these lesions constituting 54.24%; followed by difficulty in voiding constituting 16.95%, acute retention in 7.79% and dysuria in 6.78% cases (TABLE-2). In the present study Transurethral resection of prostatic biopsy cases constituted the major bulk, accounting to 270 cases out of 295 cases constituting to 91.52% (TABLE-3). The most common histological lesion encountered was nodular hyperplasia without prostatitis seen in 188 cases constituting to 63.73%, followed by nodular hyperplasia with prostatitis among 97 cases constituting to 32.88% (TABLE-4). Among these 97 cases of prostatitis, 87 were of chronic non-specific prostatitis with nodular hyperplasia, 07 cases showed nodular hyperplasia with abscess formation, 03 cases showed granulomatous prostatitis in association with nodular hyperplasia (TABLE-5).

## 5. Discussion

Prostatism is a common malady in the geriatric age group. Nodular hyperplasia is increasing frequently with advancing

age. The various histological appearances of nodular hyperplasia and prostatitis are well known and have been described and illustrated extensively in the literature and these lesions were encountered in the present study also.

Advanced age and an intact androgen supply are the only undisputed risk factors for Nodular hyperplasia. It does not occur in men castrated before puberty. In the present study nodular hyperplasia was common among the age group of 60-69 years with the mean age of 66 years (TABLE-1). The youngest patient with nodular hyperplasia was 41 years and the oldest was 93 years. According to study done by Brawn et al<sup>1</sup>, the average age of presentation for nodular hyperplasia was 69 years. In the study done by Di Silverio et al.<sup>2</sup> the mean age for nodular hyperplasia was 68.9 years. In another study done by Kyungeun et al.<sup>3</sup> the mean age was 64.4 years (42-78 years) in 148 cases. Our findings are similar to the above studies.

The various clinical presentations of prostatic diseases can be grouped as obstructive or irritative lower urinary tract symptoms. Irritative symptoms included urgency, increased frequency, dysuria and nocturia. Obstructive symptoms included hesitancy, weak stream, terminal dribbling and acute or chronic retention of urine. Most of the patients in the present study came with irritative lower urinary tract symptoms, while obstructive urinary tract symptoms were the next common mode of presentation. The most common presenting symptom in the present study was increased frequency of micturition (TABLE-2). In a study of 50 cases by Herawi et al.<sup>4</sup> the major presenting signs and symptoms were urinary obstructive symptoms in more than 50% of patients.

TURP chips formed the bulk of the specimen in the present study, accounting for 270 cases out of 295 cases constituting to 91.52% (TABLE-3). This can be explained by the fact that TURP is the treatment of choice of nodular hyperplasia, as it is a simple procedure with fewer complications as compared to open prostatectomy. In a study done by Brawn et al.<sup>1</sup> 2842 prostate specimens were included. Out of these, TURP chips formed 83.7% of total cases. Our findings were in accordance with the study done by Brawn et al<sup>1</sup>.

The term nodular hyperplasia, as proposed by Moore is a more exact designation.<sup>5</sup> The disease represents nodular enlargement of the gland caused by hyperplasia of both glandular and stromal components. The most common lesion encountered in the present study was nodular hyperplasia of prostate constituting to 63.73% (TABLE-4). According to the study done by Brawn et al<sup>1</sup> on 2842 prostatic specimens nodular hyperplasia was diagnosed in 79% of cases. Anna Pacelli<sup>6</sup> and David G. Bostwick<sup>7</sup> reported incidence of 81.7% of nodular hyperplasia.

In the present study, out of 295 cases, 188 cases were of Nodular Hyperplasia (63.73%), 87 were nodular hyperplasia with chronic prostatitis, 07 cases showed nodular hyperplasia with abscess formation, 05 cases of Nodular hyperplasia with transitional metaplasia (1.69%), 04 cases of nodular hyperplasia with basal cell hyperplasia (1.36%), 03 cases of nodular hyperplasia with granulomatous prostatitis and 01 case of Nodular hyperplasia with infarct (TABLE-

4,5). According to the study done by Mittal B V et al<sup>8</sup> on 185 prostatic specimens, prostatitis was seen in 30 cases (16.24%), granulomatous prostatitis in 3 cases (1.62%), nodular hyperplasia in 103 cases (55.67%), nodular hyperplasia with basal cell hyperplasia in 10 cases (5.4%) and metaplasias in 19 cases (10.27%). Our findings are similar to those of Mittal B V et al<sup>8</sup>

The hallmark of nodular hyperplasia is nodularity. The composition of the nodules ranges from purely stromal fibromuscular nodules to fibroepithelial nodules with glandular predominance. Glandular proliferation takes in the form of aggregations of small to large to cystically dilated glands, lined by two layers, an inner columnar and an outer cuboidal or flattened epithelium. In the present study nodular hyperplasia cases showed hyperplasia of both epithelial and stromal components (Fig-1,2). According to the study by Bostwick et al.<sup>9</sup> nodular hyperplasia is composed of varying proportion of epithelium and stroma. The most common nodules reported in their study were adenofibromatous nodules which contained all elements.<sup>9</sup>

Other variant of hyperplasia includes basal cell hyperplasia which is a benign lesion that consists of thickness of two or more basal cells at the periphery of the prostatic acini and is often misdiagnosed as adenocarcinoma. Present study showed 4 cases of basal cell hyperplasia in the age group of 65-75yrs with usual symptom of difficulty in voiding. It was characterized by nesting growth pattern with proliferating small, darkly staining basal cells. Most of the nests of basal cell hyperplasia show vertical palisading of basal cells towards the periphery (Fig- 3,4). Mittal et al<sup>8</sup> found 5.4% of basal cell hyperplasia in his study done on 185 cases which included 86 prostatectomy specimens, 81 TURP specimens and 18 needle biopsies. The percentage was quite low in the present study as no prostatectomy specimens were included.

Metaplasia's in benign prostatic epithelium are usually secondary to inflammation or injury. They are not preneoplastic. Transitional metaplasia is usually a focal, incidental finding with small, solid nests or partial gland involvement by cytologically bland and uniform elongated cells, with some cells exhibiting nuclear grooves and cytoplasmic clearing (Fig-5). The present study showed 5 cases of transitional metaplasia associated with nodular hyperplasia in the adjacent prostatic tissue.

Infarct of the prostate occurs predominantly in large prostates that exhibit nodular hyperplasia. The present study showed 01 case of prostatic infarct and microscopically there were sharply outlined areas of coagulative necrosis involving the glands and stroma (Fig-6).

Prostatic abscess characterized by sheets of neutrophils in and around the acini were noticed in 7 cases in the present study (Fig- 7). The results were similar to the study done by Chandanwale Shirish<sup>10</sup> et al which showed 4 cases of acute prostatitis. In the study by Granados et al<sup>11</sup> 25 cases of prostatic abscess were studied.

In cases of chronic non-specific prostatitis lymphocytes, plasma cells and macrophages were seen. In the present study cases of chronic prostatitis showed diffuse collections of lymphocytes and macrophages in the stroma (Fig- 8). Most of them are chronic abacterial prostatitis cases. Bostwick in his study has reported more cases of chronic abacterial prostatitis as compared to bacterial prostatitis<sup>9</sup>.

In the present study 03cases of non-specific granulomatous prostatitis were noted, out of which one case showed well-formed epithelioid granulomas with giant cells. There was no evidence of caseation (Fig- 9,10). In a study by Still, out of 200 cases of granulomatous prostatitis reported, 138 were of nonspecific granulomatous prostatitis (69%) and 49 cases were of post biopsy granulomas (3.5%) and 6 cases were of systemic granulomatous disease (3%).<sup>12</sup>

## 6. Conclusion

Thus the present study focused on the non –malignant lesions of prostate excluding the pre malignant and malignant conditions. The most common lesion we encountered in this study was nodular hyperplasia, followed by nodular hyperplasia with chronic prostatitis. The common age group was 60-69 years and the most common symptom was increased frequency of micturition.

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**Table 1:** Age distribution among prostatic lesions in the present study

| Age group          | No. of cases (%) |
|--------------------|------------------|
| 40-49              | 09 (03.05%)      |
| 50-59              | 51 (17.28%)      |
| 60-69              | 124 (42.03%)     |
| 70-79              | 89 (30.17%)      |
| 80-89              | 19 (06.46%)      |
| 90-99              | 03 (01.01%)      |
| Total no. of cases | 295 (100%)       |

**Table 2:** Clinical presentation

| Clinical features     | No. of cases |
|-----------------------|--------------|
| Frequency             | 160 (54.24%) |
| Nocturia              | 06 (02.04%)  |
| Urgency               | 05 (1.69%)   |
| Difficulty in voiding | 50 (16.95%)  |
| Straining             | 03 (1.03%)   |
| Poor stream           | 10 (3.38%)   |
| Hesitancy             | 02 (0.68%)   |
| Incomplete voiding    | 15 (5.08%)   |
| Hematuria             | 01(0.34%)    |
| Acute retention       | 23 (7.79%)   |
| Dysuria               | 20 (6.78%)   |
| Total no .of cases    | 295 (100%)   |

**Table 3:** Nature of the prostatic tissue

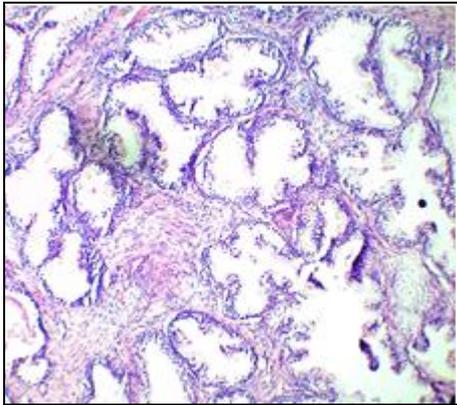
| Nature of the tissue                 | No. of Cases |
|--------------------------------------|--------------|
| Trans urethral resection of prostate | 270          |
| Prostatic needle core biopsies       | 25           |
| total no .of cases                   | 295          |

**Table 4:** Histological spectrum of the prostatic lesions studied

| Histological diagnosis                                | No. of cases (%) |
|-------------------------------------------------------|------------------|
| Nodular hyperplasia without prostatitis               | 188(63.73%)      |
| Nodular hyperplasia with prostatitis                  | 97 (32.88%)      |
| Nodular hyperplasia with basal cell hyperplasia       | 04 (01.36%)      |
| Nodular hyperplasia with transitional cell metaplasia | 05 (01.69%)      |
| Nodular hyperplasia with infarct                      | 01 (0.34%)       |
| Total no .of cases                                    | 295 (100%)       |

**Table 5:** Various types of prostatitis in the present study

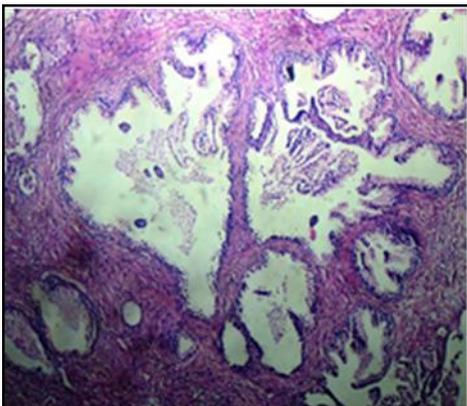
| Histological diagnosis            | No of cases |
|-----------------------------------|-------------|
| Chronic non- specific prostatitis | 87          |
| Abscess formation                 | 07          |
| Granulomatous prostatitis         | 03          |
| Total cases                       | 97          |



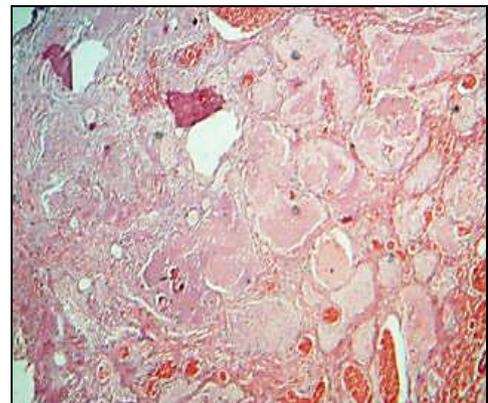
**Figure 1:** Nodular hyperplasia with glandular Predominance (H&E X 40)



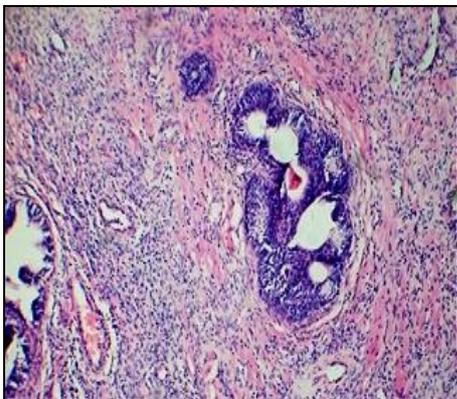
**Figure 5:** Transitional metaplasia of Prostate showing small, solid nests of cytologically Bland and uniform elongated cells, with some cells Showing cytoplasmic clearing (H&E X 100)



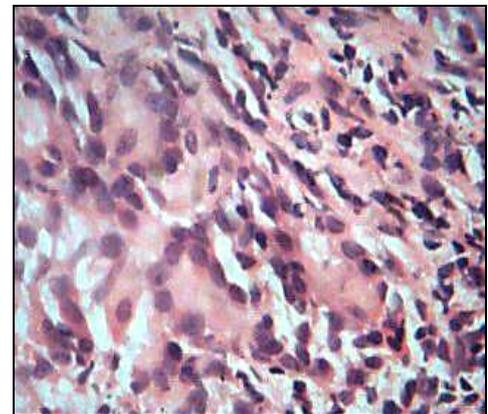
**Figure 2:** Nodular hyperplasia of prostate ( H&E X100)



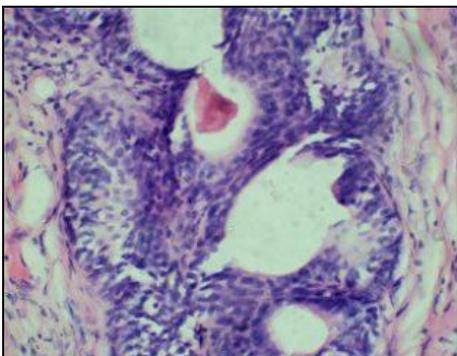
**Figure 6:** Photomicrograph of prostatic infarct showing sharply outlined areas of coagulative necrosis involving glands and stroma (H&E X100)



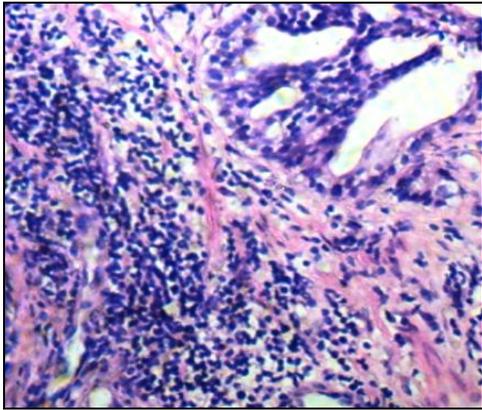
**Figure 3:** Basal cell hyperplasia composed of glands with small darkly staining basal cells with peripheral palisading H&E (X 100)



**Figure 7:** Acute prostatitis with abscess formation characterized by sheets of neutrophils in and around prostatic acini (H&E X400)



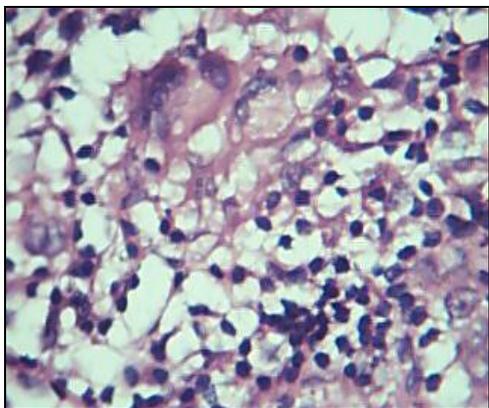
**Figure 4:** Basal cell hyperplasia composed of glands with small darkly staining basal cells with peripheral palisading H&E (X 400)



**Figure 8:** chronic prostatitis with diffuse collections of lymphocytes in stroma (H&E X400)



**Figure 9:**Granulomatous prostatitis with well-formed epithelioid granulomas and giant cells,no caseous necrosis (H&E X100)



**Figure 10:**Granulomatous prostatitis with well-formed epithelioid granulomas and giant cells,no caseous necrosis (H&E X400)