Spectrum of Urothelial lesions in Cystoscopic biopsies: A Histopathological Perspective.

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Abstract
Background
Urinary Bladder lesions are one of the most common presenting lesions in the Outpatient department. On the other hand neoplastic conditions of the urinary bladder are the major cause of morbidity and mortality. Bladder carcinoma is the 7th most common carcinoma worldwide and is the major cause of morbidity and mortality.

Material & Methods
All the cystoscopic biopsy received in the Department of Pathology at Nobel medical college and teaching hospital from August 1st 2016 to July 31st 2017 was included in the study. Received cystoscopic biopsies were processed and classified as per 2004 WHO/ISUP classification of urothelial tumors Patients were also categorized according to the age and sex to find out the prevalence of urothelial lesions on them.

Results:
Out of the 78 patients 54 were males and 24 were females. Very few (n=15, 19.23%) cases of non neoplastic lesions were biopsied. Low grade urothelial carcinoma was the most common diagnosis in the patients which accounts for 49.2 % (n=31) of the total neoplastic conditions.

Conclusion:
Low grade urothelial carcinoma was the most common lesion encountered with the peak age range of 61-70 years.

Key words:
Urothelial carcinoma, low grade, high grade, cystitis

Introduction:
Urinary Bladder lesion is one of the most common presenting lesions in the OPDS, which includes both neoplastic and non neoplastic conditions. Non neoplastic conditions like cystitis are barely lethal but they detoriate the quality of life. On the other hand neoplastic conditions of the urinary bladder are the major cause of morbidity and mortality[1]. Prevalance of Bladder carcinoma varies worldwide. It ranks 7th most common cancer worldwide[2] and is 2nd among the tumor seen by urologist after prostatic cancer[3]. Prevalence of Urothelial tumors varies in Asian countries. As per Indian census, it is the 9th most common tumor in India[4]where as in Pakistan, it ranks 3rd behind lung and oral cavity cancer in male[5]. Incidence of male to female patients are (3-4:1) [6]. The higher number of urothelial carcinoma in male may be due to smoking habits, and occupational exposure[7].Most of the patient present
with gross and microscopic hematuria[8]. Types of urothelial carcinoma have varied from country to country. 90% of the bladder carcinoma in the western countries were those of Transitional cell type, where as Squamous cell type was the most common in Egypt[9]. WHO/ ISUP has categorized urothelial tumors into Papilloma, Papillary urothelial neoplasm of low malignant potential (PUNLMP), Low grade papillary carcinoma (LPUC) and high grade papillary urothelial carcinoma[10]. Majority of the newly diagnosed bladder cancers are of low grade papillary urothelial carcinoma without invasion which has shown recurrence rate up to 75%[11]. The recurrence of tumor has increased in the prevalence of the tumor. The various subtypes of bladder tumor has shown difference in clinical, diagnostic and therapeutic differences[12]. Cystoscopy is the primary and gold standard diagnostic tool for the bladder tumors[13]. So, this study was done to find the frequency of different types of bladder lesions seen in our medical college along with the variability in age and sex of the patient.

**Material and Methods:**

Ethical clearance from the institutional review committee was taken for the study. All the cystoscopic biopsy received in the Department of Pathology at Nobel medical college and teaching hospital from August 1st 2016 to July 31st 2017 were included in the study. Received cystoscopic biopsies were fixed overnight with 10% formalin and then processed. Four micron thick sections were obtained and were stained with H&E. 2004 WHO/ISUP classification of urothelial tumors were used to categorized neoplastic lesions. Patients were also categorized according to the age and sex to find out the prevalence of urothelial lesions on them.

**Result:**

A total of 78 cystoscopic biopsies were received in the department of Pathology over the study period. All of them were included in the study. Among the 78 cases, 54 (69.24%) were males and 24(30.76%) were females with male: female ratio of 2.25:1. Neoplastic conditions were not seen in any sex group below 50 years of age. Patients with neoplastic conditions outnumbered than the non neoplastic condition. A total of 63 neoplastic lesions were seen in compare of 15 non neoplastic conditions. Male (n = 46) to female (n = 17) ratio in neoplastic condition was 2.7:1. Age group of the patient ranged from 31 years to 92 years. Peak age group was present in between 61-70 years. Distribution of the patient as per age and sex were shown in Table 1.

**Table 1: Age and sex distribution of all patients**

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
<th>Total</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>2</td>
<td>2.60</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2.60</td>
</tr>
<tr>
<td>40-50</td>
<td>5</td>
<td>6.41</td>
<td>3</td>
<td>3.84</td>
<td>8</td>
<td>10.25</td>
</tr>
<tr>
<td>51-60</td>
<td>12</td>
<td>15.38</td>
<td>6</td>
<td>7.69</td>
<td>18</td>
<td>23.07</td>
</tr>
<tr>
<td>61-70</td>
<td>23</td>
<td>29.48</td>
<td>10</td>
<td>12.82</td>
<td>33</td>
<td>42.30</td>
</tr>
<tr>
<td>71-80</td>
<td>10</td>
<td>12.82</td>
<td>4</td>
<td>5.12</td>
<td>14</td>
<td>17.94</td>
</tr>
<tr>
<td>&gt;80</td>
<td>2</td>
<td>2.56</td>
<td>1</td>
<td>1.28</td>
<td>3</td>
<td>3.84</td>
</tr>
<tr>
<td></td>
<td>54</td>
<td>69.24</td>
<td>24</td>
<td>30.76</td>
<td>78</td>
<td>100</td>
</tr>
</tbody>
</table>

Various histopathological diagnosis were tabulated (Table 2) as non neoplastic and neoplastic lesion. Among the non neoplastic lesion chronic non specific cystitis was the most common lesion encountered.

**Table 2: Distribution of cases according to histopathological diagnosis**

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Histopathological diagnosis</th>
<th>No. of Cases</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Non Neoplastic lesions</td>
<td>15</td>
<td>19.23</td>
</tr>
<tr>
<td>1</td>
<td>Chronic non specific cystitis</td>
<td>08</td>
<td>10.25</td>
</tr>
<tr>
<td>2</td>
<td>Eosinophilic cystitis</td>
<td>01</td>
<td>1.28</td>
</tr>
<tr>
<td>3</td>
<td>Acute of Chronic Cystitis</td>
<td>04</td>
<td>5.12</td>
</tr>
<tr>
<td>4</td>
<td>Follicular cystitis</td>
<td>01</td>
<td>1.258</td>
</tr>
<tr>
<td>5</td>
<td>Tubercular cystitis</td>
<td>01</td>
<td>1.28</td>
</tr>
<tr>
<td>B</td>
<td>Neoplastic Lesions</td>
<td>63</td>
<td>80.77</td>
</tr>
</tbody>
</table>

A total of 63 patients of neoplastic lesions were observed in the study. Distributions
of the neoplastic lesions were done according to 2004 WHO/ISUP classification (Table 3). Of the total neoplastic lesion low grade papillary urothelial carcinoma (n=31, 49.2%) was the predominance one, none of which showed muscular invasion. 14 cases (22.23%) were those of high grade urothelial carcinoma. 10 out of 14 cases showed muscular invasion. All the neoplastic lesions were those of transitional cell type.

**Table 3: Histological Grading of Urothelial Neoplasm as per ISUP/WHO 2004**

<table>
<thead>
<tr>
<th>S. No</th>
<th>Grade</th>
<th>No. of cases</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Papilloma</td>
<td>8</td>
<td>12.69</td>
</tr>
<tr>
<td>2</td>
<td>PUNLMP</td>
<td>10</td>
<td>15.87</td>
</tr>
<tr>
<td>3</td>
<td>Low grade papillary urothelial carcinoma</td>
<td>31</td>
<td>49.20</td>
</tr>
<tr>
<td>4</td>
<td>High grade papillary urothelial carcinoma</td>
<td>14</td>
<td>22.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63</td>
<td>100</td>
</tr>
</tbody>
</table>

**Picture 1 (100x magnification, H&E Stain):** Papilloma showing papillary fragments.

**Picture 2 (400x magnification, H&E Stain):** Papillary urothelial neoplasm of low malignant potential (PUNLMP) showing proliferation of cells without mitosis and significant atypia.

**Picture 3 (400x magnification, H&E Stain):** Low grade Urothelial Carcinoma showing mitosis at all level with moderate cellular atypia but with the preservation of an umbrella cells.
**Discussion:**

Urothelial Papilloma is a benign tumour of an urinary bladder with a finger like projection where as PUNLMP (papillary urothelial neoplasm of low malignant potential) is an abnormally thick urotheium, but without cytologic atypia. They share few features of similarity with papilloma. Low grade papillary urothelial carcinoma is a papillary neoplasm lined by urothelium with minimal nuclear atypia consisting of scattered hyperchromatic nuclei, infrequent mitotic figures and mild variation in size and shape where as High grade papillary urothelial carcinoma is a urothelial neoplasm exhibiting papillary fronds which show cells that are dyscohesive with large hyperchromatic nuclei, high degrees of anaplasia and atypical mitotic figures [2]. Cystoscopic biopsy is the primary diagnostic tool in the diagnosis of urothelial lesions. Apart from the diagnosis, it also provides additional information to the urologist which can impact the treatment[14].

In our study, 69.24% of the total patients were male and male to female ratio was 2.25:1. In the study done by Pudasaini et al[14] it was 3.5:1 but in the study done Thapa et al, it was 2.7:1[15]. Peak age group of our study was 61-70 years with presence of 42.30% of total cases of the study which is similar to the study done by Pudasaini et al, Thapa et al and Laishram et al[14-16]. Various urothelial lesions were tabulated as neoplastic and non neoplastic lesions. Majority of the cases were those of neoplastic lesions (n=63, 80.77%). It may have happen, because biopsy was done in the clinical suspicion of neoplasia. Among the non neoplastic condition, non specific chronic cystitis was the most common disease encountered(n=8, 10.25%), which was similar to result of Thapa et al [15](12.94%) and Vaidya et al [17](14.95%).

All of the malignant lesions in our study were those of urothelial carcinoma where as a small portion of squamous cell carcinoma was encountered in the study done by Thapa et al, Vaidhya et al and Bhawana et al [15, 17, 18] (it is ideal to mention the name of authors). Among the Urothelial carcinoma, low grade urothelial carcinoma was most common with presence of 31 cases (49.2%) which was similar to the study done by Laishram et al (53.85%) [16] and Thapa et al (50%)[15]. Present study was carried out to find out the spectrum of bladder lesions in Nobel Medical college. Since Pathological grading and muscle invasion are the most significant predictors of survival [19], we looked for the muscle invasion in each malignant case. Muscle invasion was seen in 10 cases (15.87% of total neoplastic conditions) of high grade urothelial carcinoma where as it was not seen in low grade carcinoma [15]. In the study done by Laishram et al, 42.1% showed muscle invasion [16], where as in the study done by Pudasaini et al it was 25% [14].

Our study shows the increase frequency of urothelial tumor in male patients of 61-70 years.
years of age. Most of the tumor were low grade urothelial carcinoma. Muscle invasion correlates with high grade malignancy hence muscle inclusion in the cystoscopic biopsy is very important.

**Conclusion:**
Low grade urothelial carcinoma was the most common lesion encountered with the peak age range of 61-70 years. Though it is low grade, recurrence rate is high hence close follow up is required. Invasion of the muscle layer was presence in most of the high grade carcinoma, hence there might be a definite correlation between tumor grade and muscle invasion.

**References:**


