Original Article

Bladder Diseases: A Histopathological Study

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Abstract

Background: There is a dearth of publications on the histopathological findings from the bladder specimen in this country. Knowledge of the profile of histological findings from bladder biopsies will help reveal the most common lesions, the demographical distribution as well as the association of clinical symptoms with various conditions and interventions to be made. **Methodology:** This was a retrospective, histopathological study conducted over a period of 10 years. Demographics of the patient were abstracted, and slides were reviewed to establish the diagnoses on bladder biopsies. **Results:** There were 180 cases of bladder lesions studied. Males accounted for 86 (47.78%), and females recorded 94 (52.22%) of the cases. The modal age group is 50–59, with 42 cases. The mean age is 54.14 ± 18.62. Inflammatory (nonneoplastic) lesions accounted for 53 (29.44%) and neoplastic lesions accounted for 127 (70.56%), of which benign lesions (squamous papilloma) were 13 (10.24%) whereas malignant cases were 114 (89.76%). Urothelial carcinoma of the bladder was the most common bladder malignancy (57%) and squamous cell carcinoma (35.96%). Lymphoma, rhabdomyosarcoma, carcinoma *in situ,* and adenocarcinoma were relatively rare. Most of the tumors were high grade. **Conclusion:** Bladder diseases are more common in females in our center, and most of the neoplastic lesions are high-grade carcinomas.

Keywords: Bladder biopsy, inflammatory lesions, neoplastic, schistosomiasis

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Introduction

Diseases of the bladder include inflammatory lesions that are usually caused by the infections of the lower urinary tract and in most cases, serve as precursor to malignancies of the bladder. Infections that cause inflammation of the bladder account for 30%–45% of all bladder diseases and range from mild chronic inflammations and abscesses to acute cystitis. In developing countries, infection with *Schistosoma* sp. as seen in Africa and parts of Asia is responsible for the inflammation of the bladder that sometimes leads to bladder malignancy.

There are over 12 million new cases of cancer reported worldwide every year, with close to 5.4 and 6.7 million occurring in developed and developing countries, respectively.[1,2] Cancer of the bladder is the ninth most common diagnosed cancer globally.[3] Among the prominent risk factors is smoking,[4,5] and in developed countries, smoking habit accounts for 50% and 35% of bladder cancers in males and females, respectively.[6] It has been reported that, carcinogenic substances excreted in the urine can produce malignant papillary tumors in the bladder. In addition, chronic urinary infection caused by schistosomiasis or bilharziasis (*Schistosoma hematobium),* which is a tropical disease, is associated with the development of squamous cell carcinoma of the bladder.[7] Similar to all cancers, the clinical management and prospects of the disease are reliant upon the stage at which it is first noticed.[8]

Histologically, noninvasive lesions at the time of diagnosis are usually categorized into the subtypes: papillary and nonpapillary (carcinoma-in-situ). Typically, superficial papillary tumors are low-grade and behave much less aggressively; however, the latter, usually aggressive, high-grade lesions and almost always progress to invasive cancer.[9] Like most other malignancies, pathological stage and histological features, including grade of tumor, are the

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important independent predictors of the prognosis.[10-12] Studies in the last decade have shown a paradigm shift in the risk factors for bladder malignancies, such as precursor inflammatory lesions, infections by *Schistosoma hematobium*, developmental anomalies, and particularly smoking habit from developed to developing countries, especially low- and middle-income countries such as Ghana. This predicts a concurrent increase in bladder malignancies incidence in such communities in the next decade or so.[13,14] The aim of the present study was to examine the histopathological features of bladder specimen to reveal the spectrum of lesions in patients diagnosed with various indications for bladder biopsy at Komfo Anokye Teaching Hospital (KATH) in the Ashanti region of Ghana.

Methodology

KATH, Department of Pathology is the study site, and it is the major referral hospital in the area. The present study employs a retrospective design with data and archived slides extracted from our center from 2009 to 2018.

Slides of tissue samples were first screened histologically and diagnoses confirmed by a consultant pathologist. Tumors were classified based on the WHO (2010, 4th edition) histological classification of tumors of the bladder. Data on demographics were also retrieved from the archived request forms.

Histopathology request forms, reports, and H and E slides of all bladder biopsies received during the study period were extracted and used for the study. A total of 180 suitable bladder cases were available for the study period.

All cases with retrieved slides and adequate information were selected for the study; cases in which the slides confirmed the histological diagnosis after histological screening were used. Cases in which the H- and E-stained slides could not be retrieved or the reports have inadequate information were totally excluded from the study. In all, 203 cases were retrieved for the study with 180 of them meeting the eligibility criteria and were used for the study. Twenty-three were discarded for having inadequate information.

Ethical approval

The committee on Human Research Publication and Ethics of the School of Medicine and Dentistry, Kwame Nkrumah University of Science and Technology and the KATH, Kumasi gave approval for the study.

Results

Age and sex distribution of bladder lesions

There were 180 cases studied over a period from 2009 to 2018. The peak age of occurrence of bladder lesions was 50–59 years with a mean of 54.14 ± 18.62. The male-to-female ratio was 1:1.09. Neoplastic cases were generally predominant over nonneoplastic or inflammatory lesions. They accounted for 70.56% of all cases with malignant cases accounting for 63.33% of all cases. The results are summarized in Table 1.

Inflammatory lesions of the bladder

There were 53 inflammatory cases comprising mild chronic bladder inflammation, abscess, and acute cystitis glandularis, altogether representing 29.44% of all cases. There was no significant difference between in the frequency of occurrence in males and females as both had almost the same number of cases. Cystitis of the bladder was the most common inflammatory lesion with 38 (71.70%) of cases and schistosomal cystitis constituting 14 cases (26.41%). Table 2 gives a summary of the distribution of inflammatory lesions.

Distribution of malignant bladder tumors

Malignant bladder tumors accounted for most of our cases with 63.33% of all cases. Urothelial carcinoma of the bladder was the most common histological type with 65 cases, representing 57% of all malignancies and squamous cell carcinoma accounting for 35.96% (41 cases). Lymphoma (non-Hodgkin's), rhabdomyosarcoma, carcinoma *in situ,* and adenocarcinoma were the other histological types of bladder malignancies with 1 (0.88%), 2 (1.76%), 3 (2.64%), and 2 (1.76%) cases, respectively. Figure 1 depicts the distribution of bladder malignancies by frequency.

Histologic grading of bladder cancer

High-grade cancers were the dominant histological classification of bladder malignancies with 67 (63.21%) of cases, of which 55 (51.89%) were poorly differentiated and 12 cases representing 11.32% were moderately differentiated. Low-grade tumors (well differentiated) accounted for 39 (36.79%). Figure 2 gives a pictorial distribution of the histological grades of malignant cases.

Discussion

Inflammatory lesions of the bladder, usually caused by infections of the lower urinary tract and in most cases, serve as precursor to malignancy of the bladder accounts for about 39% of all bladder disorders according to the study and range from mild chronic inflammation and abscess to acute cystitis glandularis. Infection with *Schistosoma* sp. in Africa and parts of Asia, as seen from this study, is responsible for inflammation of the bladder and consequently, bladder malignancy.[15,16] According to Johansson and Cohen,[17] it accounts for over 75% of all bladder cancers, usually squamous cell carcinoma of the urinary bladder.

Bladder cancer is one of the most common cancers since 1991 when it was found to be the second most common genitourinary malignancy in a report by Klufio.[18] Bladder cancer is a common urologic cancer that has the highest recurrence rate of any malignancy. Bladder cancers affect more females than males per our findings, which contrast to work done by Mayo Clinic Staff in America, which presented more bladder cancer cases in males than females.[19] The peak age group of occurrence of 50–59 years is in line with several studies

not only on bladder cancer but numerous other malignancies. It is no surprise, therefore, that neoplastic lesions of which malignant ones predominate, represented the most common lesions from the study. Inflammatory nonneoplastic lesions, primarily, chronic cystitis caused by *Schistosoma hematobium*, were also common from the study. This is not unusual as several other studies in Africa reported schistosoma-related inflammatory lesions of the bladder.[16] Urothelial carcinoma of the bladder was the most common histologic type of bladder malignancies, according to our study and represents more than 50% of cases. This finding correlates with several other works, which recorded similar trends. In a study by Umbreit *et al*. of Mayo Clinic in America, they recorded a higher rate of urothelial carcinoma.[19] and confirmed by Kos, who also posited that urothelial carcinoma or transitional cell carcinoma (TCC) is by far the most common type of bladder malignancy.[20] The trend was further consolidated by a report by Razmaria,[21] and Babjuk *et al*.[22] who reported on a similar result. This, however, is still very low compared to the 90% urothelial/TCC and 3% squamous cell carcinoma of the bladder reported by Metts *et al*.[23] in an American population. They reported very high squamous cell carcinoma in Egypt (75%), an African population, hence agreeing with findings from our study, which proved with adequate information that squamous cell carcinoma is one of the most common bladder malignancies, accounting for 35.96% of the cases despite trailing urothelial carcinoma. Even though our findings is backed by previous study which also reported squamous cell carcinoma to be the second most common bladder malignancy,[24] there is a huge difference in the incidences between our findings and theirs, 1%–2% compared to the 36% recorded in our study. The difference in the occurrence of this type of cancer may be due to the several factors such as race, weather, environment, and diet among other factors, an assertion that is shared by Farhood *et al*. in their study in Iran.[25] Al-Samawi and Aulaqi also reported 17% of Squamous cell carcinoma (SCC) in Oman,[26] while a study in England also reported only 1% of SCC in bladder cancers[27] and 7% was recorded in the United States.[28]

Carcinoma *in situ*, adenocarcinoma, rhabdomyosarcoma, and lymphoma (non-Hodgkin lymphoma) were the other histological types of bladder malignancies recorded and were observed in decreasing order of prevalence, respectively (2.64%, 1.76%, 1.76%, and 0.88%). These are usually rare types of bladder cancers, and their prevalence is similar across several other studies, like what was reported in Oman,[26] where the prevalence of these rare bladder malignancies is to our study. Preponderance of high-grade cancers was evident as the study recorded about two-third of the cases. This finding is similar to other studies in Africa and beyond. Low-grade cancers are usually seen in the younger age group and high grade in older ones as revealed in our study in which most of our patients are in the sixth decade of life.[23,29] The female preponderance of

Table 1: Age and sex distribution for type of bladder lesion

Age group	Lesion type			*n*
	Inflammatory	Neoplastic		
		Benign	Malignant	
0-9	2	1	2	5
10-19	1	1	1	3
20-29	4	0	0	4
30-39	7	2	17	26
40-49	11	2	14	27
50-59	11	3	28	42
60-69	5	2	24	31
70-79	7	1	21	29
80-89	2	1	6	9
90-99	2	0	1	3
>100	1	0	0	1
n	53	13	114	180
Male	26	7	53	94
Female	27	6	61	86
n	53	13	114	180

n=Total number of cases

Table 2: Distribution of inflammatory lesions

Inflammatory lesions			
Types	Gender		Total (%)
	Male	Female	
Schistosomiasis	8	6	14 (26.41)
Nonspecific cystitis	18	20	38 (71.70)
Hyperemia	0	1	1 (1.89)
Total	26	27	53 (100)

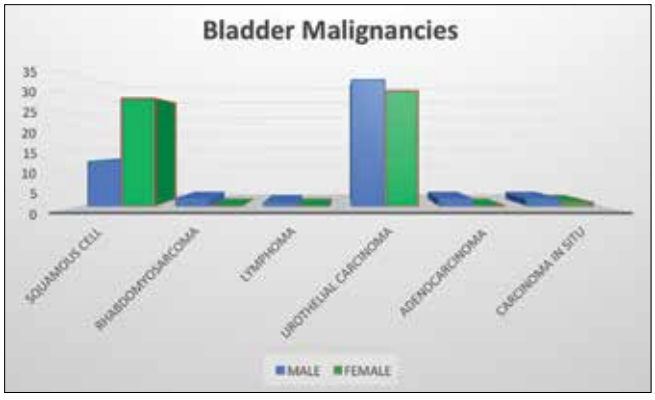

Figure 1: Gender and histologic types of malignant bladder tumors

Figure 2: Histological grading of urothelial and squamous cell carcinoma of the bladder

squamous cell carcinoma in our study contrasts the work of Metts *et al*. who found males to be 2–3 times more susceptible than females.[23]

Conclusion

Bladder lesions are more common in females than males, and bladder masses were the most common indication for biopsy in our center. While urothelial carcinoma was the most common bladder malignancy in our study, most of them are high-grade tumors and require interventional measures. Chronic cystitis with bladder cancer, especially schistosomal cystitis was observed in the study. Early screening for bladder lesions and treatment of disorders should be encouraged to prevent neoplastic transformation.

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Conflicts of interest

There are no conflicts of interest.

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