e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(7); 708-712

Original Research Article

# Histopathological Study of Paediatric Renal Tumors in North-West Rajasthan

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**Received: 20-04-2023 / Revised: 11-05-2023 / Accepted: 25-06-2023**
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**Conflict of interest: Nil**

**Abstract:**

**Introduction:** Most renal tumours present with non-specific features of an abdominal mass usually detected incidentally.

**Aim:** Histopathological study of paediatric renal tumors in North Western Rajasthan.

**Method:** This was a Hospital based retrospective and prospective study conducted on 26 nephrectomy specimens ranging in age from 10 days to 18 years at Department of Pathology, Sardar Patel Medical College, Bikaner from January 2015 to December 2021.

**Results:** Out of 26 nephrectomy specimens 23 were neoplastic lesion and 3 were non neoplastic in nature. Simple nephrectomy was performed for 14 (53.85%) cases and radical nephrectomy performed for 10 (38.46%) cases. In remaining 2 cases (7.69%) renal biopsy was taken. 14 (53.85%) nephrectomy specimens were received from right side and 12 (46.15%) specimens from left side. Among neoplastic lesions, 3 cases (13.04 %) of benign and 20 cases (86.96.%) of malignant diseases were found. In 20 malignant neoplasms, wilm's tumor were 17(85.00%), which constituted vast majority of cases and renal cell carcinoma were 3 cases (15%).

**Conclusion:** Wilm's tumor was the most common and overall males were more affected then females.

**Keywords:** Childrens, Nephrectomy, Histopathology, Renal tumor.



## Introduction

Most renal tumours present with non-specific features of an abdominal mass usually detected incidentally by parents or carers. There are no specific radiological features that can reliably distinguish the histological types of malignant paediatric renal tumours, so tumors should be extensively sampled to allow diagnostic classification, staging, and to capture tumor heterogeneity. [1]

Nearly 6–7% of pediatric cancers consist of renal tumors and 90% of them are Wilms tumor.[2] peak incidence is at 3–4 years of age[3] and 80% of patients present before 5 years of age.[4] It is bilateral in 4–13% of children[5].

During childhood renal tumors apart from wilms tumor are less frequently seen. In children the most frequently observed non-Wilms tumors include renal cell carcinoma, clear cell sarcoma of the kidney, and malignant rhabdoid tumor of the kidney, congenital mesoblastic nephroma, primitive neuroectodermal tumor and renal lymphoma. Non-wilms tumor group seen in childhood has a heterogenous structure and its tumoral behavior cannot be fully understood because of its rarity.[6] Renal cell carcinoma is accounting for less than 7% of all primary renal tumors manifesting in the first 2 decades of life.[7] Congenital mesoblastic nephroma is the most common solid renal tumor in the neonate.

It is usually identified within the first 3 months of life with 90% of cases discovered within the 1st year of life. [8] Multilocular cystic renal tumour's tend to manifest at two age peaks: in children aged 3 months to 4 years occur predominantly in boys and in adults predominantly in women.[4] Clear cell sarcoma of the kidney accounts for 4–5% of primary renal tumors in childhood.[8] Rhabdoid tumor comprising 2% of pediatric renal malignancies.

Approximately 80% occur in patients less than 2 years of age and 60% in patients less than 1 year of age with the majority (25%) diagnosed between 6 and 12 months of age. [9] The need for adequate tumor sampling since it can reveal other important

histopathologic clues, in order to establish the correct diagnosis and stage within a clinically relevant timeframe and start appropriate treatment.

**Aim:** Histopathological study of paediatric renal tumors in North Western Rajasthan.

**Method:** This was a Hospital based retrospective and prospective study conducted on 26 nephrectomy specimens ranging in age from 10 days to 18 years at Department of Pathology, Sardar Patel Medical College, and Bikaner from January 2015 to December 2021. All the radical and partial nephrectomy specimens of paediatric age group were included in the study. Autolysed specimens were ruled out from study. Tissue was processed by means of paraffin wax processing. Haematoxylin and Eosin staining was done.

Results were recorded accordingly and special stains were done wherever required. Periodic acid Schiff's staining was done. With PAS procedure, glycogen and mucin demonstrate magenta staining. Glycogen staining is removed in the diastase treated slide whereas mucin staining is retained. Masson trichome staining was done. Histopatholgical examination was done which includes degree of cellularity, crowding and overlapping of nuclei, nuclear atypia, mitoses (per 10 HPF), coagulative necrosis, and secondary changes any variation in morphological and growth pattern.

**Statistical Analysis:** data thus collected was entered in Microsoft excel sheet and was analysed by Epi info Software. Prevalence was observed in percentage.

**Result**

Out of 26 nephrectomy specimens 23 were neoplastic lesion and 3 were non neoplastic in nature.

**Table 1: Distribution of Cases According To Age and Sex**

| Age (yrs) | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| <1 | 5 | 71.43 | 7 | 26.92 | 2 | 28.57 |
| 1-5 | 10 | 76.92 | 13 | 50.00 | 3 | 23.08 |
| 5-10 | 4 | 100.00 | 4 | 15.38 | 0 | 0.00 |
| >10 | 1 | 50.00 | 2 | 7.69 | 1 | 50.00 |
| | | | 26 | 100.00 | | |

In present study most of the patients were in paediatric age group of 1-5 years (13 cases, 50%) followed by <1 years of age group 7(26.92%). Out of 26 cases mostly were males 10(76.92%) cases predominantly affecting 1-5years age group whereas females were 2 (28.57%) mostly affecting <1years age group.

**Table 2: Distribution of Cases According to Type of Specimen, Side/ Laterality and Tumor Type**

| Type of Specimen | No. of Cases | Percentage |
|---|---|---|
| Radical nephrectomy | 10 | 38.46 |
| Simple nephrectomy | 14 | 53.85 |
| Renal biopsy | 2 | 7.69 |
| Side | | |
| Right | 14 | 53.85 |
| Left | 12 | 46.15 |
| Tumor type | | |
| Benign | 3 | 13.04 |
| Malignant | 20 | 86.96 |

In present study, simple nephrectomy was performed in 14 cases(53.85%), while radical nephrectomy was performed in 10 (38.46%) cases. Out of 26 cases, in 14 cases (53.85%) right kidney was involved and 12 cases (46.15%) left kidney was involved. Out of 23 cases, 20 cases (86.96%) were malignant and 3 cases (13.04%) were benign.

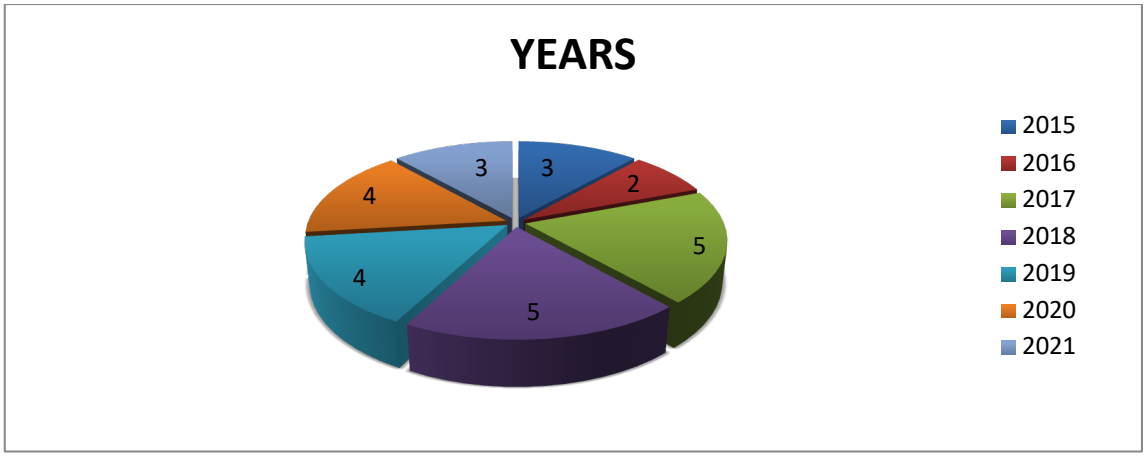


**Figure 1: According to year**

In present study, total number of cases were 26 out of total 56843 histopathology specimens, maximum paediatric renal tumors cases 5 (0.06%) were found year 2017 and 5 (0.05%) in 2018 and minimum cases 2 (0,02%) were found in years 2016.

**Table 3: Distribution of different neoplastic and non-neoplastic conditions and frequency of neoplastic and non-neoplastic lesions**

| Diagnosis | No. of Cases | Percentage |
|---|---|---|
| Wilms tumor | 17 | 65.38 |
| Congenital mesoblastic nephroma | 3 | 11.54 |
| Multicystic dysplastic kidney | 3 | 11.54 |
| Renal cell carcinoma | 3 | 11.54 |
| Lesion type | | |
| Neoplastic | 23 | 88.46 |
| Non neoplastic | 3 | 11.54 |

In present study, maximum number of cases 17 (65.38%) cases was found of wilms tumor and 3 (11.54%) cases were found of congenital mesoblastic nephroma, multicystic dysplastic kidney respectively and renal cell carcinoma respectively. Out of 26 cases, 23 cases (88.46%) were neoplastic lesion and 3 cases (11.54%) were non neoplastic lesion.

**Table 4: Sex wise distribution of different neoplastic and non-neoplastic conditions cases in the present study**

| Type of Lesion | Male | Frequency (%) | Female | Frequency (%) |
|---|---|---|---|---|
| Wilms tumour | 14 | 70.00 | 3 | 50.00 |
| Congenital mesoblastic nephroma | 2 | 10.00 | 1 | 16.67 |
| Renal cell carcinoma | 2 | 10.00 | 1 | 16.67 |
| Multicystic renal dysplasia | 2 | 10.00 | 1 | 16.67 |

In this study, wilms tumour was the most common lesion in both male (14 cases, 70.00%) and female (3 cases, 50.00%). Overall males were more commonly affected than females.

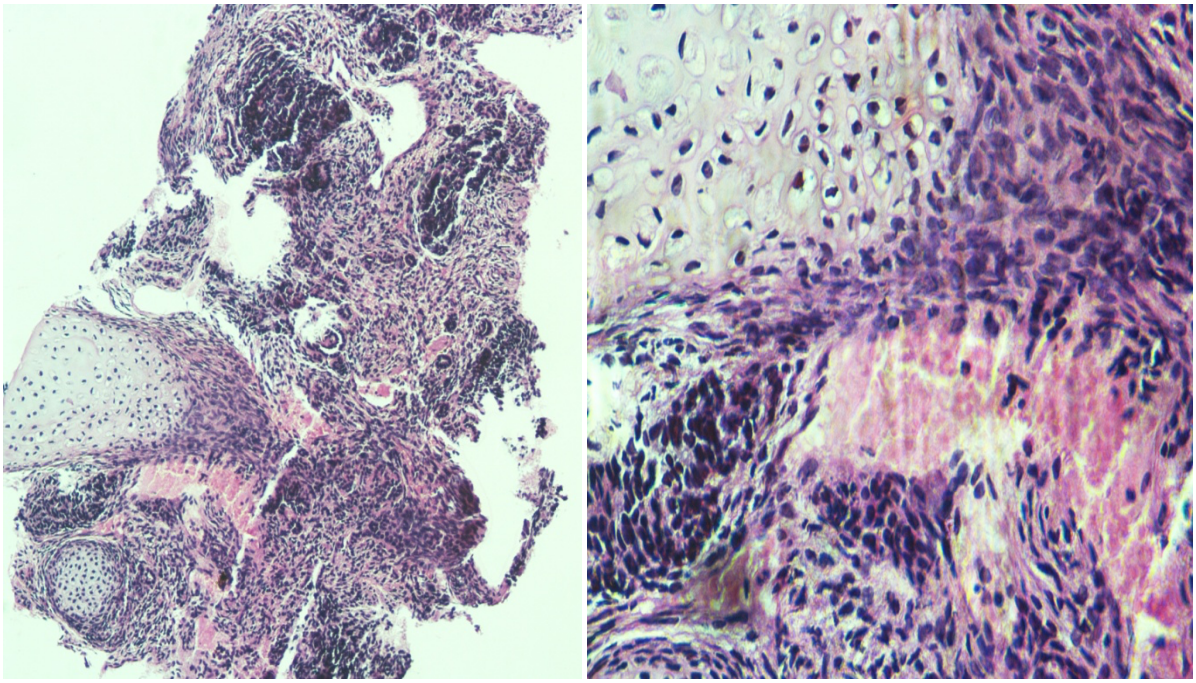

**Figure 2: Wilms tumor showing tightly packed blue cells (blastemal component), interspersed primitive tubules (epithelial component) and foci of cartilage (mesenchymal component) (H&E, 4x and 40x)**

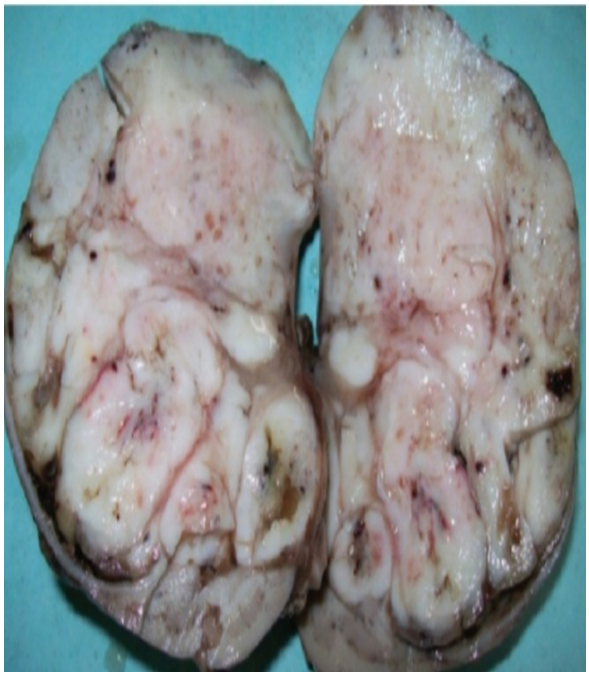

**Figure 3: Wilms tumor showing well circumscribed mass with lobulated cut surface and areas of haemorrhage and necrosis**

**Discussion:**

In our study, males are relatively more commonly affected than females (3:1) which is slightly greater than study of Bozlu G et al.[10] Most commonly affected age group was 2-5 years which is similar in our and Miniati D et al[11] study. In our study, average age of wilms tumor presentation was 3.9 years almost similar to study of Miniati D et al11 in our study, majority of non wilms tumor were found above the age of 2 years similar to Miniati D et al [11]. We found male preponderance which is similar to RN Das et al. [12]

Non wilms tumor had equal sex distribution. In the present study, total of 26 nephrectomy specimens were studied. Out of which 6 cases, (23.08 %) were benign while 20 cases, (76.92 %) were malignant in

nature. Similar reported in Bozlu G et al. [10] in the present study, most common neoplastic lesion was wilms tumor 65.38 % cases, followed by 11.54% cases of renal cell carcinoma, congenital mesoblastic nephroma and multicystic kidney dysplasia each. Bozlu D et al [10] and nuzhath T et al [13] also reported similar observations.

## Conclusion

Wilm's tumor was the most common finding in our study. Overall males were more affected then females.

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