

The Contribution of Computed Tomography in the Diagnosis of Paediatric Abdominal Masses: Epidemiological Study and Radiological-Histological Concordance at the Bouaké's Teaching Hospital

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Abstract

Introduction: Abdominal masses in children present a diagnostic challenge due to the diversity of their causes and the subtlety of clinical signs. Computed tomography (CT) plays a key role in their evaluation. **Objective:** To describe the epidemiological and CT characteristics of paediatric abdominal masses and to evaluate their concordance with histological findings. **Methodology:** A descriptive retrospective study conducted over two years at Bouaké University Hospital and a private centre, involving 36 children. Of these, 26 underwent histological confirmation by biopsy or surgical excision, which was used as the basis for calculating sensitivity, specificity and positive predictive value. Cases without histology were considered negative after clinical confirmation and/or follow-up imaging over a minimum period of six months. **Results:** The average age was 5.6 years, with a predominance of males (58.3%). The masses were mainly abdominal (75%), located in the hypochondrium or left flank (24.3%), and often situated in the retroperitoneum (58.3%). The kidneys (19.4%) and adrenal glands (11.1%) were the most commonly affected structures. Tumours were the most common cause (72.2%), with nephroblastoma being the most prevalent (30.6%), followed by lymphoma (16.7%). Based solely on the 26 chil-



dren with histology, CT showed a sensitivity of 100%, a specificity of 83.3% and a PPV of 95.2%. **Conclusion:** CT scanning is an essential tool for diagnosing paediatric abdominal masses, facilitating appropriate management, particularly in settings with limited resources.

Keywords

Abdominal Mass, Child, Epidemiology, CT Scan, Histology

1. Introduction

Abdominal masses in children pose a diagnostic challenge due to the diversity of their causes and the subtlety of their clinical manifestations. Computed tomography (CT), a powerful imaging tool, allows for the assessment of their location, nature, vascularisation and extent, thereby facilitating diagnosis, treatment planning and follow-up.

In resource-limited countries, such as those in sub-Saharan Africa, CT is an essential asset, particularly when access to histology is restricted or delayed [1]. The CT characteristics of abdominal masses vary according to their aetiology, and several studies have shown the good performance of CT in distinguishing tumour masses from non-tumour masses. A study in India reports that Wilms' tumour (nephroblastoma) is the most common tumour in children, followed by neuroblastomas and lymphomas, reflecting a similar spectrum throughout Asia [2]. In West Africa, studies in Mali and Burkina Faso report a high incidence of nephroblastoma, followed by Burkitt's lymphoma and neuroblastoma [3] [4].

In Côte d'Ivoire, data on the CT scan characteristics of paediatric abdominal masses remain limited, despite high demand for imaging in this area. Hence the interest of this study, which aims to describe the epidemiological and CT characteristics of these masses and to evaluate their concordance with histological results, in order to improve diagnostic management in our context.

2. Methodology

2.1. Type and Setting of the Study

This is a retrospective descriptive study, conducted over two years, from January 2022 to December 2024, in two imaging centres located in Bouaké: the Bouaké University Hospital Centre (CHU) and the Bouaké Medical Imaging and Analysis Centre (CIMAB).

The radiology department at the Bouaké University Hospital Centre has two ultrasound rooms, two standard X-ray rooms, one specialised X-ray room, and mammography and dental panoramic imaging equipment. The two CT scanners available were not operational during the study period. In 2023, the department performed approximately 14,646 X-rays (40 per day) and 19,356 ultrasounds. Due to the simultaneous breakdown of both scanners at the university hospital during

the study period, CT scans were prescribed either in the paediatric medicine or paediatric surgery departments and then performed at the CIMAB. A harmonised protocol was put in place to limit technical variations, but slight differences in image quality may have resulted from the specific configuration of the CIMAB device. True negatives were confirmed by CT scan, illustrated by iconographic images, in order to reduce the verification bias linked to the absence of histological confirmation.

2.2. Inclusion and Exclusion Criteria

All children aged 0 to 15 years, regardless of gender, who underwent abdominal-pelvic CT scans during the study period were included. Incomplete records and follow-up examinations were not included.

2.3. Examination Procedure

Abdominal-pelvic CT scans were performed with the patient in the supine position, using parameters adapted to the age, weight and height of the children in order to minimise radiation exposure. In cases where iodinated contrast medium was injected, fasting was required beforehand. Where possible, the examination was performed with the patient holding their breath briefly in order to limit motion artefacts. A team trained in paediatric imaging was responsible for the procedure.

CT scans allow for accurate assessment of abdominal and pelvic masses (malformations, tumours or infections), with good sensitivity in emergency situations. However, they expose patients to ionising radiation and may require sedation, which poses a risk, particularly in children.

2.4. Variables Studies

- Epidemiological and clinical: age, sex, medical history, location of the mass, indication for the examination.
- Radiological (CT): conditions of performance, location of the mass, volume, affected structures, characteristics (density, homogeneity, contours, calcifications), associated signs and preliminary diagnosis.
- Histological: final diagnosis.

2.5. Statistical Analysis

The data were entered using Microsoft Word 2013 and analysed using Epi Info software version 7.2.2.6. The diagnostic performance of CT was assessed by calculating sensitivity, specificity and positive predictive value, using histology as the reference standard. We also performed a correlation based on the p-value ($\alpha = 0.05$) to assess the relationship between epidemiological and clinical data and CT.

2.6. Ethical Considerations

The study was approved by the Institutional Ethics Committee of the Bouaké Uni-

versity Hospital. Written parental consent was obtained for the retrospective use of data. Confidentiality of information was respected.

3. Result

3.1. Epidemiological and Clinical Data

The study included a total of 36 children aged 0 to 15 years, with a mean age of 5.6 years (range 2 to 14 years). The most represented age group was children over 6 years old, found in 41.7% of cases (n = 15) in **Table 1**.

Table 1. Distribution of patients by age group.

Age group	N = 36	%
Newborn (<29 days)	0	0
Infant (1 month - 2 year old)	9	25
Young child (2 - 6 year old)	10	27.8
Older child (7 - 15 year old)	15	41.6

A male predominance was observed with a sex ratio of 1.4 (58.3% boys). The majority of children came from rural areas (66.7%; n = 24).

Clinically, the main reason for performing computed tomography (CT) was the presence of an abdominal mass, found in 77.8% of cases (n = 28). Clinically, the most common locations were the left hypochondrium and flank in 24.3% of cases.

3.2. Computed Tomography Data

3.2.1. Location and Characteristics of Masses

The masses were mainly located in the abdominal cavity (75%; n = 27), while abdominal-pelvic locations accounted for 25% of cases (n = 9). The retroperitoneal location was predominant, found in 58.3% of cases. The most frequently affected anatomical structures were the kidneys (19.4%) and adrenal glands (11.1%).

In terms of radiological characteristics, 41.7% of masses were tissue density, 58.3% were heterogeneous in appearance, and 72.2% had regular contours. Tumour volume was specified in 42.2% of cases, ranging from 148 to 3,413 ml. Calcifications were visible in 25% of cases (n = 9). Associated signs included ascites (44.4%) and abdominal lymphadenopathy (22.2%) (**Table 2**).

Table 2. Distribution of patients according to CT scan characteristics.

Characteristics of mass		N = 36	%
Localisation	Intraperitoneal	15	41.7
	Retroperitoneal	21	58.3
Nature	Tissue	15	41.7
	Fluid	10	27.8
	Mixed	6	16.7
	Other	3	8.3

Continued

Volume	Yes	17	45.45
	No	19	54.55
Characters	Homogeneous	15	41.7
	Heterogeneous	21	58.3
Outlines	Regular	26	72.2
	Irregular	10	27.8
Calcification	Yes	9	25
	No	27	75
Adenopathy	Yes	8	22.2
	No	28	77.8
Ascite	Yes	16	44.4
	No	20	55.6

3.2.2. Nature of the Masses

The majority of masses were of tumour origin (72.2%), followed by malformative causes (13.9%), infectious causes (5.6%) and other various aetiologies (8.3%).

Malignant tumours accounted for 58.3% of cases, dominated by nephroblastoma (30.6%) in **Figure 1(b)**, followed by lymphomas (16.7%) in **Figure 1(a)** and neuroblastomas (5.6%). Benign tumours were represented by cystic lymphangioma (11.5%).

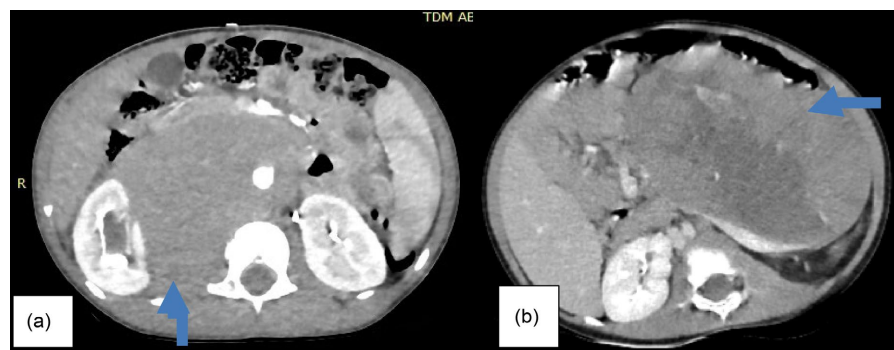


Figure 1. Axial section of an abdominal lymphoma (a) in a 13-year-old child and a nephroblastoma (b) in a 10-year-old child.

Among non-tumour causes, malformations included megaureter (11.1%) and megacolon (2.8%). Infectious masses included cases of pyometocolpos (2.8%) and multifocal tuberculosis (2.8%). Finally, cases of splenomegaly (5.6%) and mesenteric haematoma (2.8%) were observed.

3.3. Correlation Analysis

Statistical analysis did not reveal any significant correlation between age and the location of the masses ($p = 0.5087$) in **Table 3**, nor between age and the type of mass ($p = 0.4487$). However, a statistically significant correlation was found be-

tween malignant masses and their retroperitoneal location ($p = 0.00018$) in **Table 3**, suggesting a particular tropism for these lesions.

Table 3. Correlation between the location of masses and age group as well as aetiologies.

		Mass localisation			p-value
		Intraperitoneal	Retroperitoneal	Total	
Age group	0 - 2 years old	4	9	13	0.5087
	3 - 6 years old	4	3	7	
	>6 years old	7	9	16	
Etiology of masses	Malignant tumours	3	18	21	0.00018
	Benign tumours	5	0	5	
	Malformative	1	4	5	
	Infectious	4	0	4	
	Other	1	0	1	
	Total	15	21	36	

3.4. Radiological-Histological Concordance and Diagnostic Performance of CT

Of the 36 children, 26 had histological confirmation. In this group, CT had a sensitivity of 100%, a specificity of 83.3% and a positive predictive value (PPV) of 95.2% (**Table 4**).

Complete concordance between CT and histology was observed for confirmed diagnoses: nephroblastoma (42%) in **Figure 2(b)**, lymphoma (23%) in **Figure 2(a)**, cystic lymphangioma (11.5%) represented in **Table 5**.

Table 4. Overall sensitivity of CT scanning compared to histological diagnostics in detecting tumour masses.

Overall sensitivity	Histology: Malignant	Histology: Benign	Total (CT scan)	Sensitivity = 100%
CT Malignant	VP = 20	FP = 1	21	Specificity = 83.33%
CT Benign	FN = 0	VN = 5	5	Positive predictive value = 95.2%
Total (histology)	20	6	26	

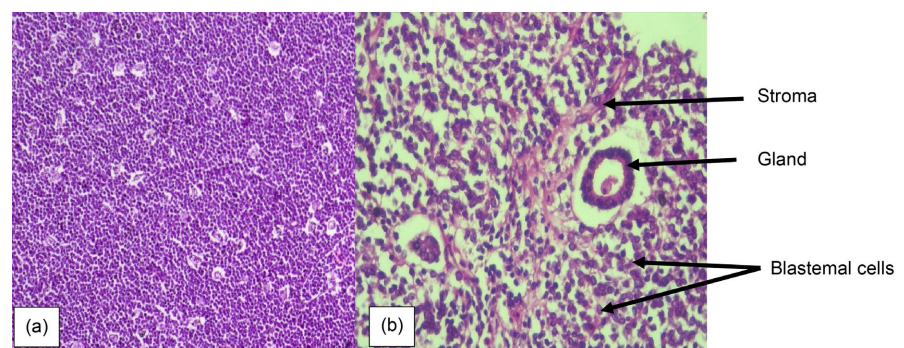


Figure 2. Burkitt lymphoma slide (a) and intermediate-risk biphasic nephroblastoma slide (b).

Table 5. Distribution of patients according to the causes of abdominal masses on CT scans.

Mechanism	CT diagnosis		Histological diagnosis	
	N	%	N	%
Tumour	26	72.2	26	100
Malignant tumours	21	58.3	20	73.1
Nephroblastoma	11	30.6	11	42
Lymphoma	06	16.7	06	23.1
Neuroblastoma	02	5.6	01	3.8
Hepatoblastoma	01	2.8	01	3.8
Immature teratoma	01	2.8	01	3.8
Benign tumours	05	13.9	06	26.9
Cystic lymphangioma	02	8.3	03	5.6
Mesenteric cyst	02	5.6	01	3.8
Mature teratoma	01	2.8	01	3.8
Cystic nephroma	00	00	01	3.8
Malformative	05	13.9	NA	NA
Primitive megaureter	04	11.1	NA	NA
Transverso-colonic megadolichocolon	01	2.8	NA	NA
Infectious	02	5.6	NA	NA
Pyometrocolpos	01	2.8	NA	NA
Multifocal tuberculosis (pleuropulmonary and lymph node)	01	2.8	NA	NA
other	03	8.3	NA	NA
Splenomegaly	02	5.5	NA	NA
Mesenteric haematoma	01	2.8	NA	NA

4. Discussion

The aim of this study was to highlight the contribution of computed tomography (CT) in the aetiological identification of paediatric abdominal masses. Despite the obvious diagnostic value of CT, our study has certain limitations, notably the small sample size, which limits the generalisability of the results. This situation illustrates the economic and structural constraints of our local context, where access to histological examination remains limited.

With regard to epidemiological and clinical data, the average age of patients was 5.6 years, close to that reported by Hamidou (6.2 years) [3]. Abdominal tumours are rare before the age of 1, more common between the ages of 1 and 6, and then decrease between the ages of 7 and 14 [5]. This highlights the need for clinical vigilance at all paediatric ages [6]-[8]. The 0 - 6 age group was the most represented (58.3%), consistent with Hamidou [3], reflecting increased vulnerability to certain diseases, particularly infectious diseases, at this age. The male predom-

inance (58.3%) found in this study, also observed by other African authors [3] [6], remains without clear explanation in the literature, but could reflect gender inequalities in access to healthcare. Clinically, abdominal mass was the main reason for CT scan (77.8%), with a preferential location in the left hypochondrium and flank (24.3%). These locations are classically associated with renal masses such as nephroblastoma or neuroblastoma [9]-[12].

With regard to CT scan data, only the location, characterisation, nature of the mass and statistical analysis will be discussed. In this study, abdominal masses were mainly located in the retroperitoneum (58.3%), with a predominance of tissue density (41.7%), heterogeneity in 58.3% of cases, and irregular contours in 28.8%. These radiological features are frequently associated with malignant tumours, particularly heterogeneity and irregular contours, which indicate an infiltrative nature. The presence of calcifications, observed in 25% of cases, is also a sign suggestive of malignancy, particularly in pathologies such as neuroblastoma [13]. The masses identified in this study were mainly of tumour origin (72.2%), confirming the tumour tropism of this location, particularly in infants and older children. Nephroblastoma was the leading cause (30.6%), followed by lymphoma (16.7%) and neuroblastoma (5.6%), results comparable to those reported in the literature [13]-[16]. Nephroblastoma, a typical embryonic tumour in children, generally occurs between the ages of 1 and 5, with a peak around $3\frac{1}{2}$ years [16] [17]. Lymphoma, particularly Burkitt's lymphoma, is common in sub-Saharan Africa in connection with Epstein-Barr virus infection and malaria [18] [19]. Neuroblastoma, the most common extracranial solid tumour in children, ranks third here, as also indicated in the international literature [13] [20]. Non-tumour masses (27.8%) included malformations (megaureter, megacolon) and infections (pyometocolpos, tuberculosis, malaria). This etiological diversity can be explained by the endemic context of certain infections in Côte d'Ivoire, as well as by the prevalence of congenital anomalies in areas with poor access to healthcare [4] [13] [14].

Statistical analysis revealed no significant link between age and location ($p = 0.5087$) or between age and type of mass ($p = 0.4487$). However, a significant association was observed between malignant masses and their retroperitoneal location ($p = 0.00018$), suggesting a particular affinity of these tumours for this anatomical region.

Histologically, nephroblastoma (or Wilms' tumour), the most common tumour, appears macroscopically as a large mass, well defined by a pseudocapsule, with a heterogeneous appearance, combining solid, necrotic, haemorrhagic and sometimes cystic areas. It can be polar, central or multifocal. Microscopically, it is an embryonic tumour of renal origin, characterised by three components: epithelial, mesenchymal and blastemal, in varying proportions depending on the case [21]. Popov [19] describes the macroscopic features and the variability in the proportions of the three histological components (blastema, epithelial, stromal). In this study, nephroblastoma accounted for 42% of histological diagnoses.

With regard to radiological-histological concordance and the diagnostic performance of CT, the results confirm the predominance of nephroblastoma in our context, followed by lymphoma. The 100% radiological-histological concordance in biopsied cases demonstrates the reliability of CT, which must be reconciled with the absence of overall statistical correlation between imaging morphology and histology, the latter analysis taking into account cases without histological confirmation. The lack of overall statistical correlation between CT morphology and histology can be explained by the inclusion in this analysis of patients without histological confirmation and with morphologically non-specific lesions. On the other hand, the 100% radiological-histological concordance observed in the biopsy subgroup reflects the diagnostic reliability of CT when compared with anatomopathological evidence, which also reflects a selection bias towards the most suspicious or operable cases. The diagnostic performance is comparable to that reported by Inoussa (Senegal, 2022) and Wadhvani (India, 2023) [20] [21]. The high sensitivity (100%) of CT scans can be explained by their excellent ability to detect the characteristic signs of malignancy (large size, necrosis, local invasion), particularly for tumours such as nephroblastoma, which have well-defined characteristics [21]. The lower specificity (83.3%) stems from the fact that certain benign tumours can present complex radiological characteristics (e.g. vascularisation, heterogeneity) that mimic the appearance of malignant tumours, thus creating false positives [22] [23]. Despite this limitation, CT remains an essential first-line examination for characterising paediatric abdominal masses and guiding management towards histological confirmation.

5. Conclusion

CT is an indispensable tool for the initial diagnosis of paediatric abdominal masses, with excellent performance when compared to histology. Even in the absence of systematic histological confirmation, the use of a rigorous imaging protocol and clinical follow-up can reduce verification bias. The development of infrastructure, improved access to CT and histology, and appropriate multidisciplinary care appear to be priorities for optimising the management of these conditions and improving children's chances of survival.

Consent

Written informed consent was obtained from the parents of the patients for the publication of this study.

Data Availability

The datasets used and analysed during the current study are available from the corresponding author upon request.

Authors' Contributions

Bouassa Davy Melaine Kouakou coordinated the study, conducted the research

and analysed the data. Malick Soro, Sara Carole Sanogo, Brou Lambert Yao, Ibrahim Touré, Iburaima Alamun Akanji, Kouamé Paul Bonfils Kouassi, Ataa Ange Rebecca Kobenan, Akoli Eklou Baudouin Bravo-Tsri, Kesse Emile Tanoh, Allou Florent Kouadio, Celine Yao, and Konaté Issa contributed to the drafting and critical revision of the manuscript. All authors read and approved the final version of the manuscript.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Hricak, H., Abdel-Wahab, M., Atun, R., Lette, M.M., Paez, D., Brink, J.A., *et al.* (2021) Medical Imaging and Nuclear Medicine: A Lancet Oncology Commission. *The Lancet Oncology*, **22**, e136-e172. [https://doi.org/10.1016/s1470-2045\(20\)30751-8](https://doi.org/10.1016/s1470-2045(20)30751-8)
- [2] Hamidou, S., Sonia, K., Alain, S.O., Aissata, K. and Diarra, Y. (2022) Palpable Abdominal Mass in Children at the Charles-de-Gaulle University Hospital Centre in Ouagadougou. *African Journal of Public Health Sciences*, **4**, 82-89.
- [3] Joseph, N., Rai, S., Singhal, K., Saha, S., Chakraborty, D., Badoni, G., *et al.* (2021) Clinico-Histopathological Profile of Primary Paediatric Intra-Abdominal Tumours: A Multi-Hospital-Based Study. *Indian Journal of Surgical Oncology*, **12**, 517-523. <https://doi.org/10.1007/s13193-021-01365-x>
- [4] Doumbia, A.K., Dembele, A., Togo, P. *et al.* (2021) Clinico-Pathological Profile of Malignant Abdominal Tumors in Children: Experience of the Pediatric Oncology Unit in Bamako. *Open Journal of Pediatrics*, **11**, 608-617. <https://doi.org/10.4236/ojped.2021.114056>
- [5] Beek, E., van Grotel, M., de Keizer, B., Littooi, A. and Nivelstein, R.J. (2021) Malignant Abdominal Tumours in Children: Initial Imaging Diagnosis and Guidance for Further Workflow. *Radiology Assistant*.
- [6] Nwokoro, C.C., Fatungase, O.M., Salami, B.A., Shonubi, A.O., Adekoya, A.O. and Oyelekan, A.A. (2015) Abdominal Masses in Children. *Annals of Health Research*, **1**, 44-47.
- [7] Kam, M., Douamba, S., Nagalo, K., Dao, L., Kouéta, F., Lougué, C., *et al.* (2017) Le syndrome de Pepper: à propos de deux cas observés au Centre Hospitalier Universitaire Pédiatrique Charles de Gaulle de Ouagadougou (Burkina Faso). *Pan African Medical Journal*, **28**, Article 189. <https://doi.org/10.11604/pamj.2017.28.189.11901>
- [8] Souza, A.M.D.E.S., Barbuto, T.M., Freitas, F.A., Vianna, N.F., Zanchetta, C.M.C., Forsait, S., *et al.* (2017) An Unusual Abdominal Wall Mass in a Child. *Revista do Instituto de Medicina Tropical de São Paulo*, **59**, e16. <https://doi.org/10.1590/s1678-9946201759016>
- [9] Sommez, K., Turkyilmaz, Z., Karabulut, R. and Basaklar, A.C. (2018) Ovarian Masses in Infant-Juvenile Age. *Archives of Argentine Pediatrics*, **116**, 359-364.
- [10] Shelmerdine, S.C., Lorenzo, A.J., Gupta, A.A. and Chavhan, G.B. (2017) Pearls and

- Pitfalls in Diagnosing Pediatric Urinary Bladder Masses. *RadioGraphics*, **37**, 1872-1891. <https://doi.org/10.1148/rg.2017170031>
- [11] El-Sharkawy, F., Delgado, P.I., Podda, A., Neville, H.L. and Rojas, C.P. (2017) Angiosarcoma of the Pelvis in a 13-Year-Old Girl. *Pediatric and Developmental Pathology*, **20**, 163-167. <https://doi.org/10.1177/1093526616686007>
- [12] Potisek, N.M. and Antoon, J.W. (2017) Abdominal Masses. *Pediatrics In Review*, **38**, 101-103. <https://doi.org/10.1542/pir.2016-0087>
- [13] Wang, H. and Cai, J. (2024) Quantitative MRI in Childhood Neuroblastoma: Beyond the Assessment of Image-Defined Risk Factors. *Radiology: Imaging Cancer*, **6**, e240089. <https://doi.org/10.1148/rycan.240089>
- [14] Jha, S.K., Brown, C., Kang, L., Diaz, E.S., Gwal, K., Alvarez, E., *et al.* (2023) Update on the Role of Imaging in Staging of Common Pediatric Abdominal Tumors. *Current Problems in Cancer*, **47**, Article ID: 100969. <https://doi.org/10.1016/j.currproblcancer.2023.100969>
- [15] Togo, B., Traoré, F., Togo, A.P., Togo, P., Diakité, A.A., Traoré, B., *et al.* (2014) Epidemiology and Prognosis of Childhood Cancers at Gabriel-Touré Teaching Hospital (Bamako, Mali). *Médecine et Santé Tropicales*, **24**, 68-72. <https://doi.org/10.1684/mst.2014.0291>
- [16] Minard-Colin, V., Aupérin, A., Pillon, M., Burke, G.A.A., Barkauskas, D.A., Wheatley, K., *et al.* (2020) Rituximab for High-Risk, Mature B-Cell Non-Hodgkin's Lymphoma in Children. *New England Journal of Medicine*, **382**, 2207-2219. <https://doi.org/10.1056/nejmoa1915315>
- [17] Chapman, H., Ntemi, P.S., Gisiri, M., Vasudevan, L., Kashaigili, H.J. and Schroeder, K. (2024) Retrospective Analysis of Pediatric Patients with Burkitt Lymphoma Treated in Tanzania Following the Implementation of the 2016 National Treatment Guidelines: Poor Outcomes to Current Standard-of-Care Therapy. *Pediatric Blood & Cancer*, **71**, e31145. <https://doi.org/10.1002/pbc.31145>
- [18] Tolbert, V.P. and Matthay, K.K. (2018) Neuroblastoma: Clinical and Biological Approach to Risk Stratification and Treatment. *Cell and Tissue Research*, **372**, 195-209. <https://doi.org/10.1007/s00441-018-2821-2>
- [19] Popov, S.D., Sebire, N.J. and Vujanic, G.M. (2016) Wilms' Tumour—Histology and Differential Diagnosis. In: van den Heuvel-Eibrink, M.M., Ed., *Wilms Tumor*, Codon Publications.
- [20] Inoussa, A.I., Ly, B.A., Badji, N., Akpo, G., Deme, H., Ndong, A.A., *et al.* (2022) Iconographic Review and Radio-Histological Concordance of Retroperitoneal Tumours in Children. *African Journal of Medical Imaging*, **14**, 254-267.
- [21] Wadhvani, U., Savaliya, D. and Desai, P. (2023) Role of Computed Tomography Imaging in Pediatric Abdominal Masses. *Asian Journal of Pediatric Research*, **12**, 19-27. <https://doi.org/10.9734/ajpr/2023/v12i3242>
- [22] An, J., He, L., Li, X. and Liu, W. (2020) Differential Diagnosis of Paediatric Retroperitoneal Tumours Using Conventional and Functional MRI and CT. *Medicine*, **99**, e20000.
- [23] Chavhan, G.B., Al-Ibraheem, A. and Parra, D.A. (2021) Magnetic Resonance Imaging of Abdominal Masses in Children. *RadioGraphics*, **41**, 1836-1856.