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Uncommon Sites of Extranodal Non-Hodgkin Lymphoma: Radiological Insights from Two Cases

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Abstract: ***Rare primary extranodal non-Hodgkin lymphomas involving kidneys and ovaries present significant diagnostic challenges due to nonspecific clinical manifestations and considerable overlap with more common malignancies [1,2]. This report describes two cases including bilateral primary renal lymphoma in an elderly patient and bilateral ovarian Burkitt lymphoma in a pediatric patient. Ultrasound and contrast-enhanced computed tomography demonstrated homogeneous infiltrative lesions associated with lymphadenopathy and absence of significant necrosis, which raised suspicion for lymphoma and guided biopsy decisions [3,4]. Early radiological recognition facilitated timely initiation of chemotherapy and prevented unnecessary surgical intervention. These findings highlight the critical role of imaging in the differential diagnosis of rare extranodal lymphomas and emphasize the importance of recognizing characteristic radiological patterns to improve clinical outcomes.***

Keywords: Extranodal lymphoma, Primary renal lymphoma, Ovarian lymphoma, Burkitt lymphoma, Non-Hodgkin lymphoma, Computed tomography

1. Introduction

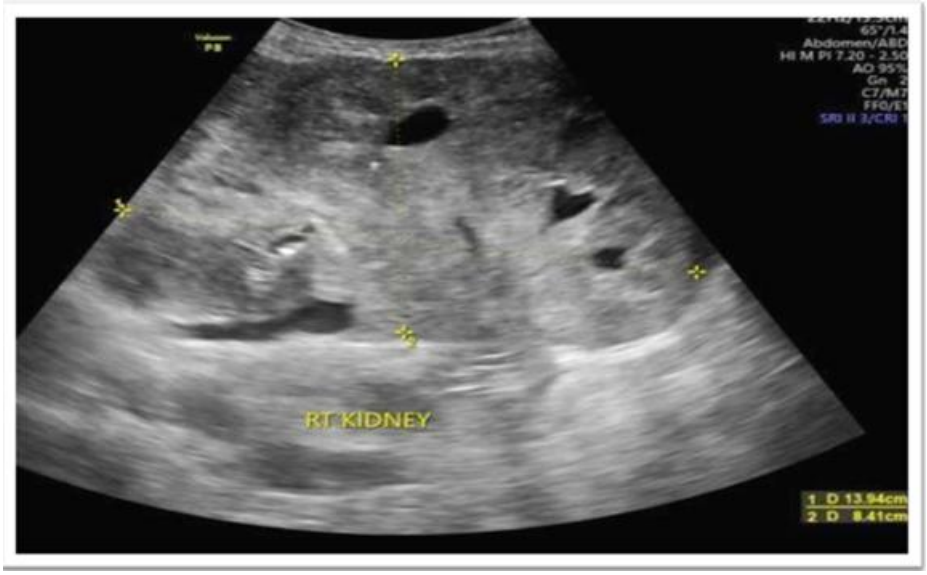
Non-Hodgkin lymphoma frequently involves extranodal sites either as a primary manifestation or as part of disseminated disease; however, primary involvement of kidneys and ovaries is exceedingly rare [2,3]. Primary renal lymphoma accounts for less than one percent of all NHL cases, and its existence remains controversial due to the absence of native lymphoid tissue within the renal parenchyma [3,5]. Similarly, primary ovarian lymphoma represents a very small proportion of ovarian neoplasms, with Burkitt lymphoma being an aggressive subtype that is particularly uncommon in pediatric patients [6,7]. These rare presentations often mimic more common malignancies such as renal cell carcinoma, germ cell tumors, and neuroblastoma, leading to diagnostic uncertainty and potentially inappropriate management [4,8]. The purpose of this study is to highlight the radiological features, diagnostic differentiation, and clinical implications of extranodal lymphomas involving renal and ovarian sites, thereby addressing an important gap in radiological recognition and improving clinical decision-making.

2. Materials and Methods

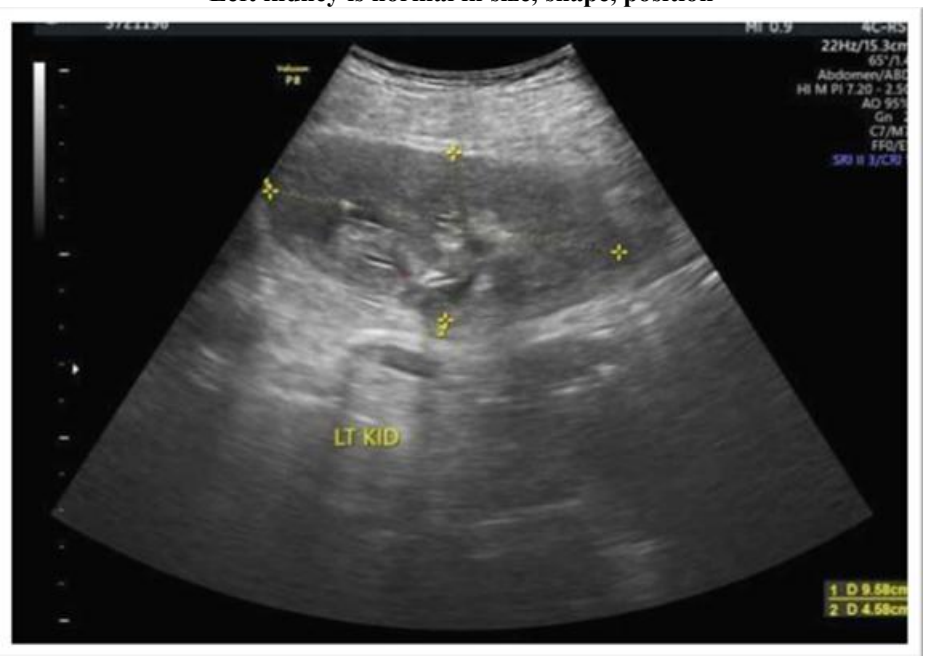
This study represents a descriptive case report of two patients presenting with suspected abdominal malignancy who underwent radiological evaluation followed by histopathological confirmation. Ultrasound was utilized as the initial screening modality in both cases due to its accessibility and absence of radiation exposure. Subsequently, contrast-enhanced computed tomography of the abdomen was performed using non-ionic iodinated contrast with acquisition in plain, arterial, venous, and delayed phases to evaluate lesion characteristics, enhancement patterns, and extent of disease involvement [3]. Imaging analysis focused on identifying bilateral organ involvement, lesion homogeneity, presence or absence of necrosis, and associated lymphadenopathy. Diagnostic suspicion of lymphoma was based on these radiological criteria described in prior imaging literature [3,4]. Histopathological confirmation was obtained through ultrasound-guided biopsy in the renal case and surgical exploration in the ovarian case. All procedures were conducted in accordance with institutional ethical standards.

3. Case 1: Primary Renal Lymphoma

An 83-year-old female presented with complaints of generalized weakness, breathlessness, and increased frequency of micturition over a duration of approximately ten to fifteen days. Ultrasound examination revealed an enlarged right kidney with heterogeneous echotexture, cortical thickening, and loss of corticomedullary differentiation, while the left kidney was normal in size, shape, and position



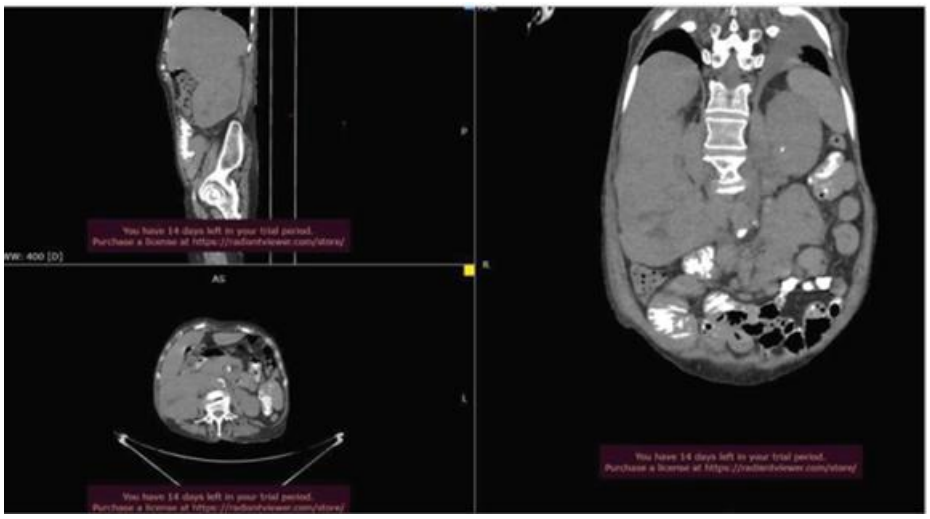
Left kidney is normal in size, shape, position



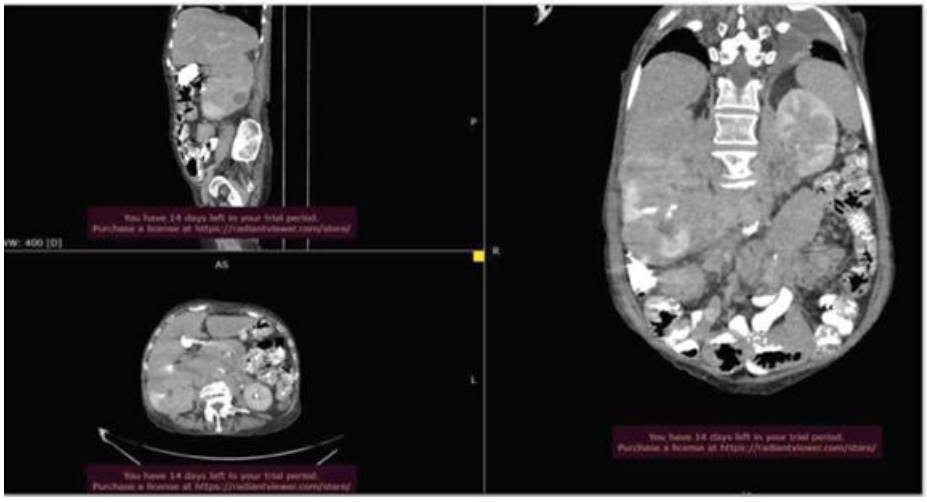
These findings were suggestive of an infiltrative renal process, prompting further evaluation with contrast-enhanced computed tomography.

CECT of the abdomen demonstrated bilateral renal enlargement with multiple well-defined homogeneous hypoenhancing lesions replacing the renal parenchyma and distorting the normal renal contours. The lesions extended into the perinephric spaces, and conglomerated retroperitoneal lymphadenopathy was noted encasing major vascular structures, including the aorta and inferior vena cava, without evidence of vascular invasion or thrombosis. There was no significant necrosis or calcification identified, and no focal lesions were seen in the liver or spleen. These imaging findings were highly suggestive of renal lymphoma, consistent with previously described radiological patterns [3,5]. However, bilateral renal cell carcinoma with metastasis was considered as a differential diagnosis.

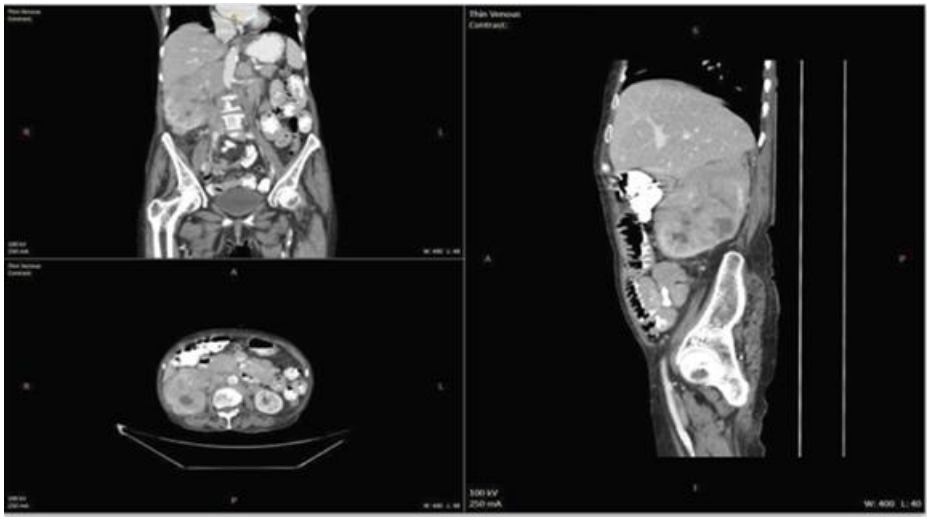
Plain CT Images



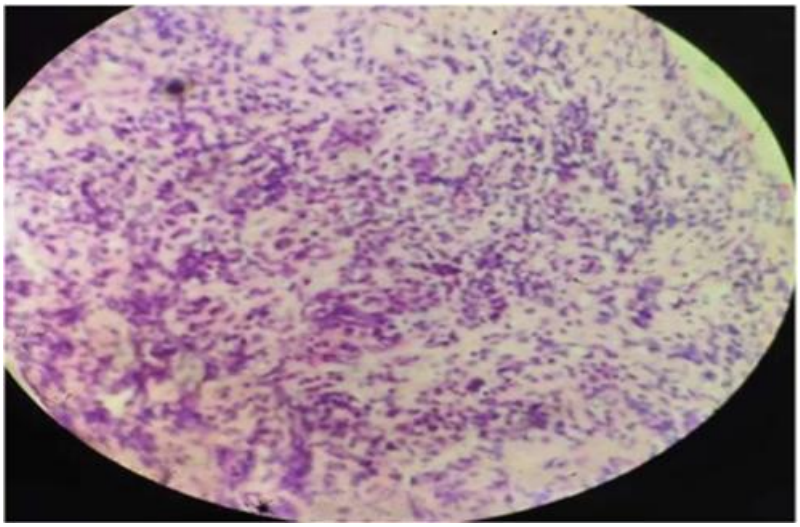
Contrast CT Images

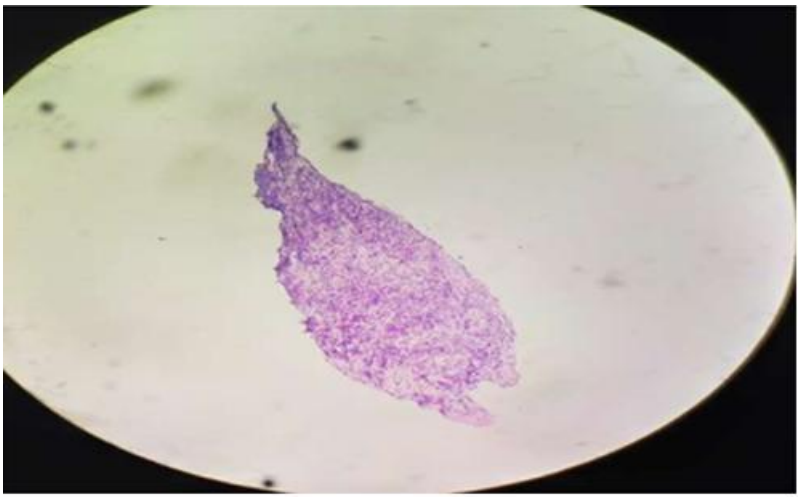


Delayed CT Images



Histopathological and immunohistochemical evaluation confirmed the diagnosis of B-cell non-Hodgkin lymphoma, demonstrating positivity for CD45, CD20, CD5, CD10, and BCL2.





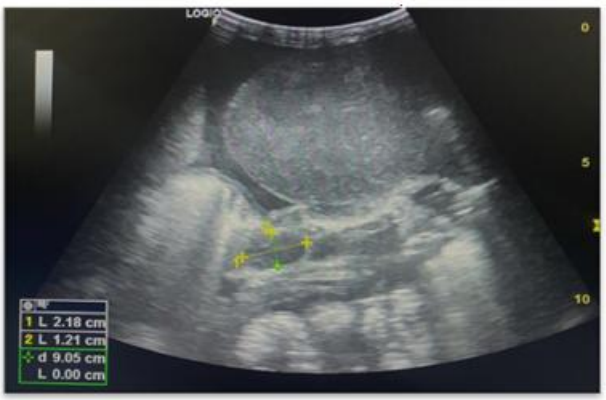
4. Final Diagnosis

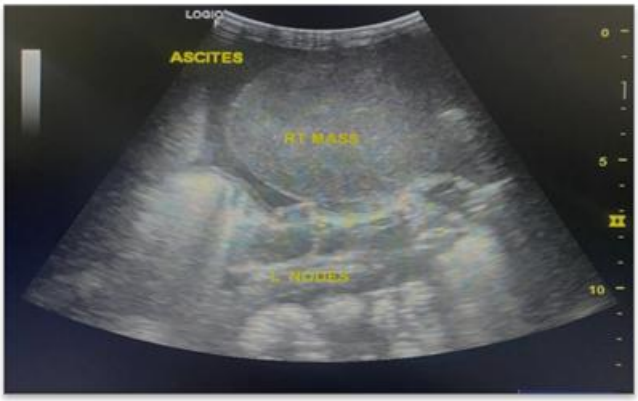
Primary Renal B-Cell Lymphoma

Case 2: Primary Ovarian Burkitt Lymphoma

Clinical Presentation

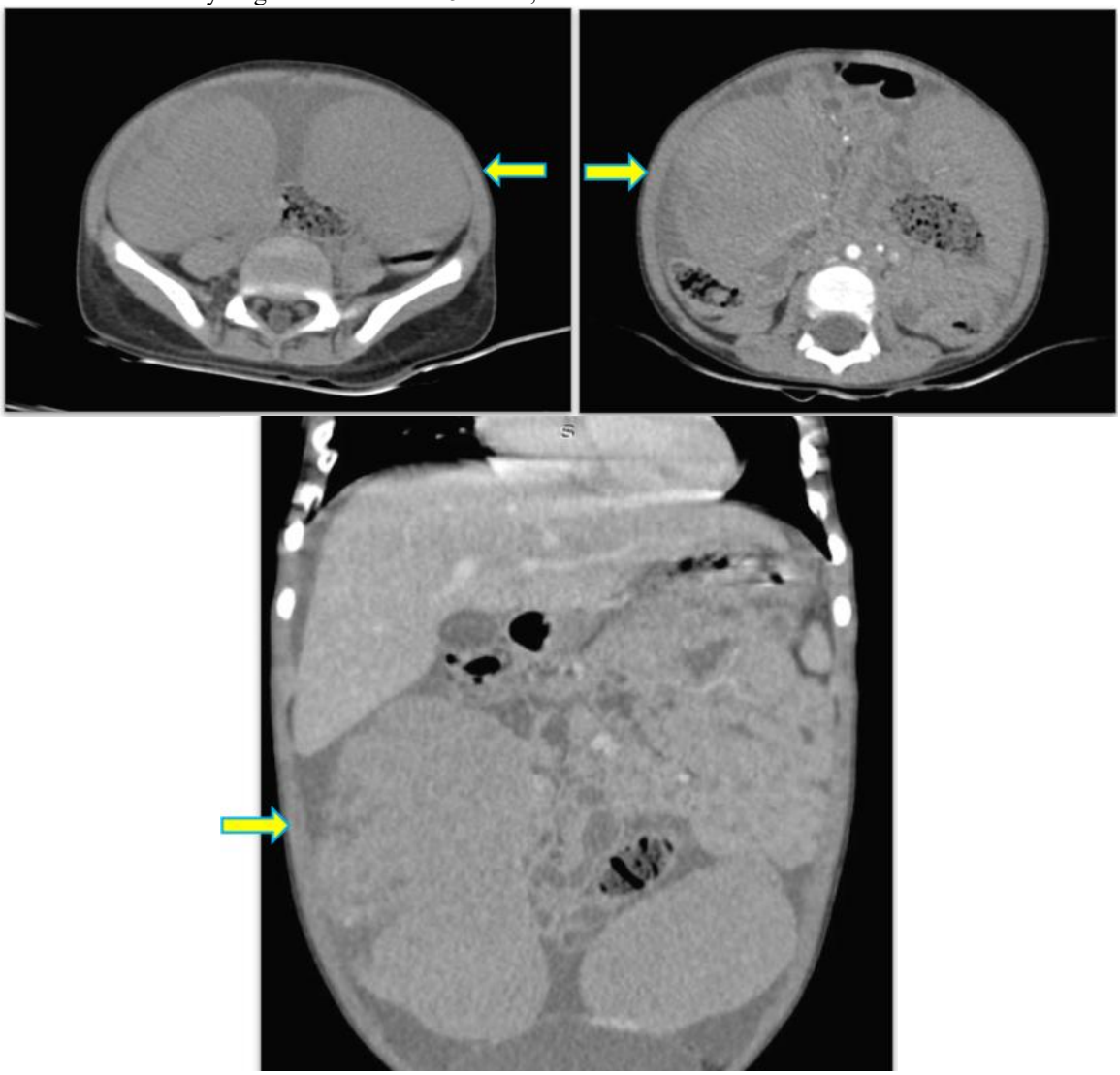
A 3-year-old female presented with abdominal pain and progressive abdominal distension. Ultrasound examination revealed bilateral large solid masses in the abdomen with features suggestive of lymph node origin, accompanied by retroperitoneal lymphadenopathy, ascites, and hepatosplenomegaly. These findings raised suspicion for a lymphoproliferative disorder, necessitating further evaluation with contrast-enhanced computed tomography.

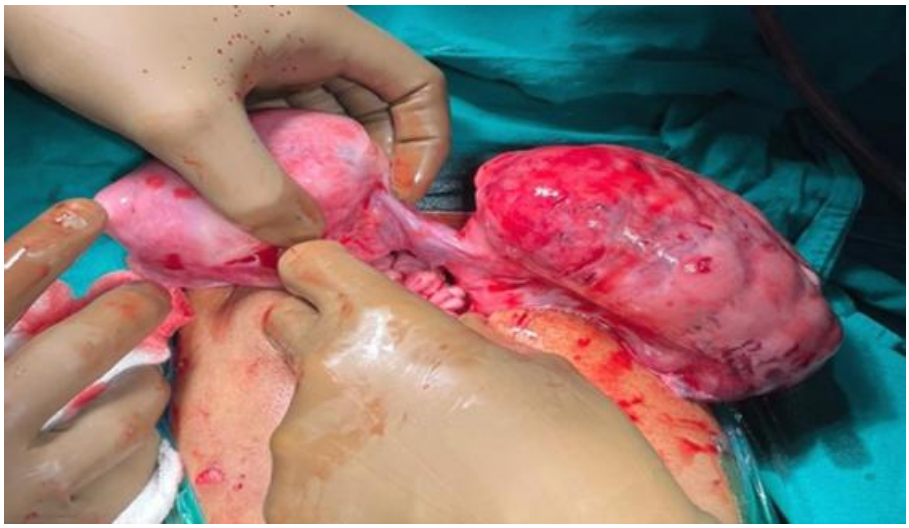


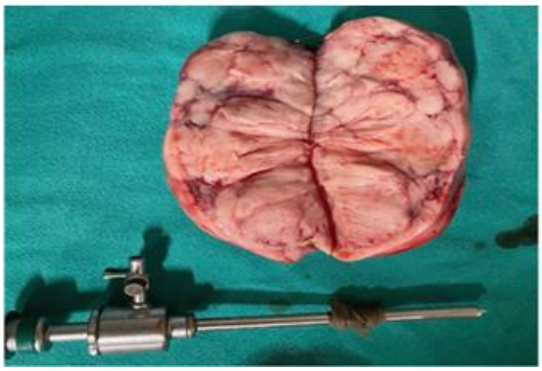


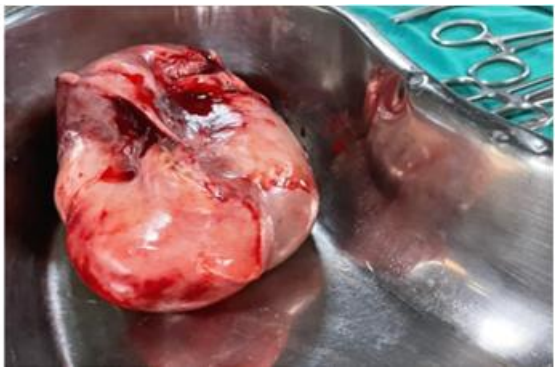
CECT Findings

CECT imaging demonstrated bilateral enhancing ovarian masses with non-necrotic para-aortic lymphadenopathy and moderate ascites, along with borderline hepatosplenomegaly. The differential diagnosis included lymphoma, germ cell tumor, and neuroblastoma. Laboratory investigations revealed elevated lactate dehydrogenase and CA-125 levels, while beta-human chorionic gonadotropin levels were within normal limits. Histopathological examination confirmed the diagnosis of Burkitt lymphoma, with immunohistochemical positivity for CD20, CD10, and BCL6, consistent with previously reported pediatric cases [6,7].









Final Diagnosis
Primary Ovarian Burkitt Lymphoma

5. Discussion

Extranodal lymphomas involving the kidney and ovary are rare clinical entities that frequently pose diagnostic challenges due to overlapping imaging features with more common malignancies [3,4]. Renal lymphoma most commonly occurs as secondary involvement; however, primary renal lymphoma should be considered when imaging demonstrates bilateral renal enlargement with homogeneous hypoenhancing lesions and associated lymphadenopathy [3,5]. The absence of necrosis and the presence of vascular encasement without invasion are important distinguishing features that help differentiate lymphoma from renal cell carcinoma, which typically demonstrates heterogeneous enhancement, necrosis, and vascular invasion [4,8].

Similarly, ovarian lymphoma is uncommon and often presents with bilateral ovarian involvement, homogeneous solid masses, associated lymphadenopathy, and ascites [6]. Burkitt lymphoma, in particular, is characterized by its aggressive biological behavior, rapid proliferation rate, and association with elevated lactate dehydrogenase levels, especially in pediatric populations [7]. Studies have shown that misinterpretation of such imaging findings may lead to unnecessary surgical interventions, emphasizing the importance of radiological awareness and early diagnosis [8,9]. Radiological evaluation therefore plays a crucial role not only in lesion detection but also in narrowing differential diagnoses, guiding biopsy, and facilitating early initiation of appropriate systemic therapy.

6. Conclusion

Primary extranodal lymphomas involving renal and ovarian sites, though rare, should be considered when imaging demonstrates bilateral homogeneous infiltrative masses with lymphadenopathy and minimal necrosis. Recognition of these radiological patterns facilitates prompt histopathological confirmation, reduces unnecessary surgical intervention, and supports early initiation of systemic therapy. Increased awareness among radiologists is essential to improve diagnostic accuracy in atypical extranodal presentations.

Ethical Statement
Informed consent was obtained from patients/guardians. Institutional ethical guidelines were followed.

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