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Case Report

Left ovarian mass revealing multivisceral lymphoma ☆

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ABSTRACT

Lymphoma encompasses a range of cancers originating in the lymphatic system, categorized into Hodgkin lymphoma and non-Hodgkin lymphoma. Hodgkin lymphoma classically present as nodal disease, whereas non-Hodgkin lymphoma tends to involve extranodal regions. While it can be part of a systemic lymphoma, isolated nodal involvement is not uncommon. Extranodal lymphoma can affect virtually any organ or tissue, with the spleen, liver, gastrointestinal tract, pancreas, abdominal wall, genitourinary tract, adrenal glands, peritoneal cavity, and biliary tract being among the most commonly involved sites, in decreasing order of frequency. We present a case involving a 54-year-old woman presented with left iliac fossa pain. A sonography was performed, which showed left pelvic mass, magnetic resonance imaging showed left ovarian mass with enlargement of the cervix. Computed tomography revealed enlargement of the pancreas and adrenal glands, along with masses in the kidneys associated with extensive pathological lymph node enlargement in the para-aortic and pelvic regions. The patient underwent biopsy of a para-aortic lymph node, which revealed a diffuse large B cell lymphoma.

Introduction

Lymphoma, a type of blood cancer, results from the abnormal, clonal proliferation of lymphocytes originating from secondary lymphoid organs such as lymph nodes, spleen, or mucosa-associated lymphoid tissue. According to the World Health Organization's International Classification of Diseases (2022), malignant lymphoma is divided into HL comprising 10% of cases and NHL comprising the remaining 90%. NHL tends to involve extranodal sites more frequently than HL. Extranodal lymphoma affects approximately 40% of patients and can manifest in nearly every organ and tissue. The spleen, liver, gastrointestinal tract, pancreas, abdominal wall,

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genitourinary tract, adrenal glands, peritoneal cavity, and biliary tract are among the commonly involved sites, listed in decreasing order of frequency [1–3].

Case presentation

A 54-year-old woman with no underlying diseases and no history of medications, sought medical attention due to pain in her left iliac fossa pain of 2 months' duration, There were no peripheral adenopathy or systemic symptoms present.

Sonography performed at outside hospital showed a solid mass with well-defined borders that appeared hypoechoic and hypovascular in the left iliac fossa.

The pelvic MRI revealed a left pelvic mass containing follicles, indicating its ovarian origin. The mass appeared poorly defined with isosignal intensity on T1 and T2 sequences, showing diffusion restriction and low ADC values. It enhanced significantly after Gadolinium injection, measuring approximately : 58 × 45 × 60 mm (AP × T × H). There is a diffuse homogeneous enlargement of the cervix, showing hypointense on T1-weighted images and relatively hyperintense on T2-weighted images (Fig. 1).

Contrast-enhanced CT scans of the thorax, and abdomen were then performed. Findings included enlargement of the pancreatic neck and body with upstream dilatation of the pancreatic duct, multiple hypodense masses in both kidneys, bilateral diffuse adrenal gland enlargement and enlarged para-aortic and pelvic lymph nodes. No hepatomegaly or splenomegaly were observed (Fig. 2).

The patient underwent a diagnostic laparoscopy, a biopsy of a para-aortic lymph node was performed. The pathological study revealed a diffuse proliferation of large lymphoid cells with round or oval vesicular nuclei, which is consistent with a diffuse large B cell lymphoma (Fig. 3).

Discussion

Lymphoma is a broad term describing cancers originating in the lymphatic system. It is divided into 2 main categories: HL and NHL. NHL commonly involves the abdomen in most patients, whereas abdominal involvement is less frequent in HL, occurring in fewer than half of cases. A typical finding in both HL and NHL is para-aortic lymphadenopathy, where lymph nodes near the aorta are enlarged. HL and NHL can manifest in different ways: affecting single or multiple lymph node groups, involving specific organs, or spreading widely throughout the body. Enlarged lymph nodes in lymphoma often displace nearby structures without invading them, distinguishing them from carcinomas which typically invade surrounding tissues. Although HL and NHL share some radiological features, their appearances on imaging studies differ significantly. These distinctions are crucial for accurate diagnosis and effective treatment planning for patients with lymphoma [2].

Cross-sectional imaging techniques like CT scans and MR imaging are primarily utilized to identify lymphadenopathy and assess the pattern of nodal involvement in lymphoma. However, these anatomical imaging methods have limitations. Small lymph nodes can contain malignant cells despite appearing normal on these scans, while larger lymph nodes may appear abnormal but be benign. To overcome these limitations, functional imaging techniques such as positron emission tomography (PET) with fluorodeoxyglucose (FDG) have emerged as valuable tools. PET-FDG imaging has demonstrated promising results in diagnosing lymphoma and providing a comprehensive evaluation of the disease's extent. It is particularly effective in detecting areas of increased metabolic activity, which often correspond to lymphoma lesions. Additionally, PET-FDG is highly useful for monitoring the response to treatment and assessing residual disease in PET-avid lymphomas [2].

Across all sites of lymphoma, the typical imaging characteristics include: Hypovascularity of masses, diffuse infiltrative form, lack of vessel steno-occlusion and multifocal lesions associated with multiple enlarged lymph nodes [1].

Nodal lymphoma is the most common form of lymphoma and is a typical form of HL and low-grade NHL [4]. Enlarged lymph nodes commonly exhibit homogeneous, mild-to-moderate enhancement [5,6]. The pathological size threshold for lymph nodes is generally defined as greater than 1.5 cm in their longest diameter, with variations in normal limits based on location [7,8]. In mesenteric lymphoma, a specific imaging sign known as the "sandwich sign" is observed. This sign refers to mesenteric lymph nodes encasing mesenteric vessels without causing luminal narrowing, creating a characteristic appearance resembling sandwich filling [9,10].

NHL may present as extranodal lymphoma of any organ [4], whereas extranodal involvement in HL is rare [11].

Ovaries

NHL can involve the gynecologic tract, with the ovary being a relatively common anatomical site. Ovarian involvement by NHL typically occurs as part of systemic disease rather than being localized. However, localized NHL of the ovary is rare. A typical pattern of ovarian NHL involvement is diffuse bilateral homogeneous enlargement. This enlargement often accompanies retroperitoneal or extranodal manifestations of lymphoma found elsewhere in the body (Fig. 1). Ovarian lymphoma frequently presents bilaterally. When diagnosing ovarian lymphoma, differential considerations include granulosa cell tumors, dysgerminoma, and metastatic cancers. Imaging plays a crucial role in distinguishing these entities and guiding appropriate management [2].

Uterus

Uterine lymphomas are rare and constitute approximately 2% of all extranodal and primary genital lymphomas in females. The most common site of involvement for uterine lymphomas is the uterine cervix [2,12]. On ultrasound (US) and computed tomography (CT), evaluation typically reveals diffuse homogeneous enlargement of the uterus in cases of uterine lymphoma. However, magnetic resonance imaging (MRI) provides more detailed characterization: lymphoma lesions tend to appear hypointense on T1-weighted images and intermediate to relatively hyperintense on T2-weighted images (Fig. 1). MRI findings of uterine cervical lymphoma can closely

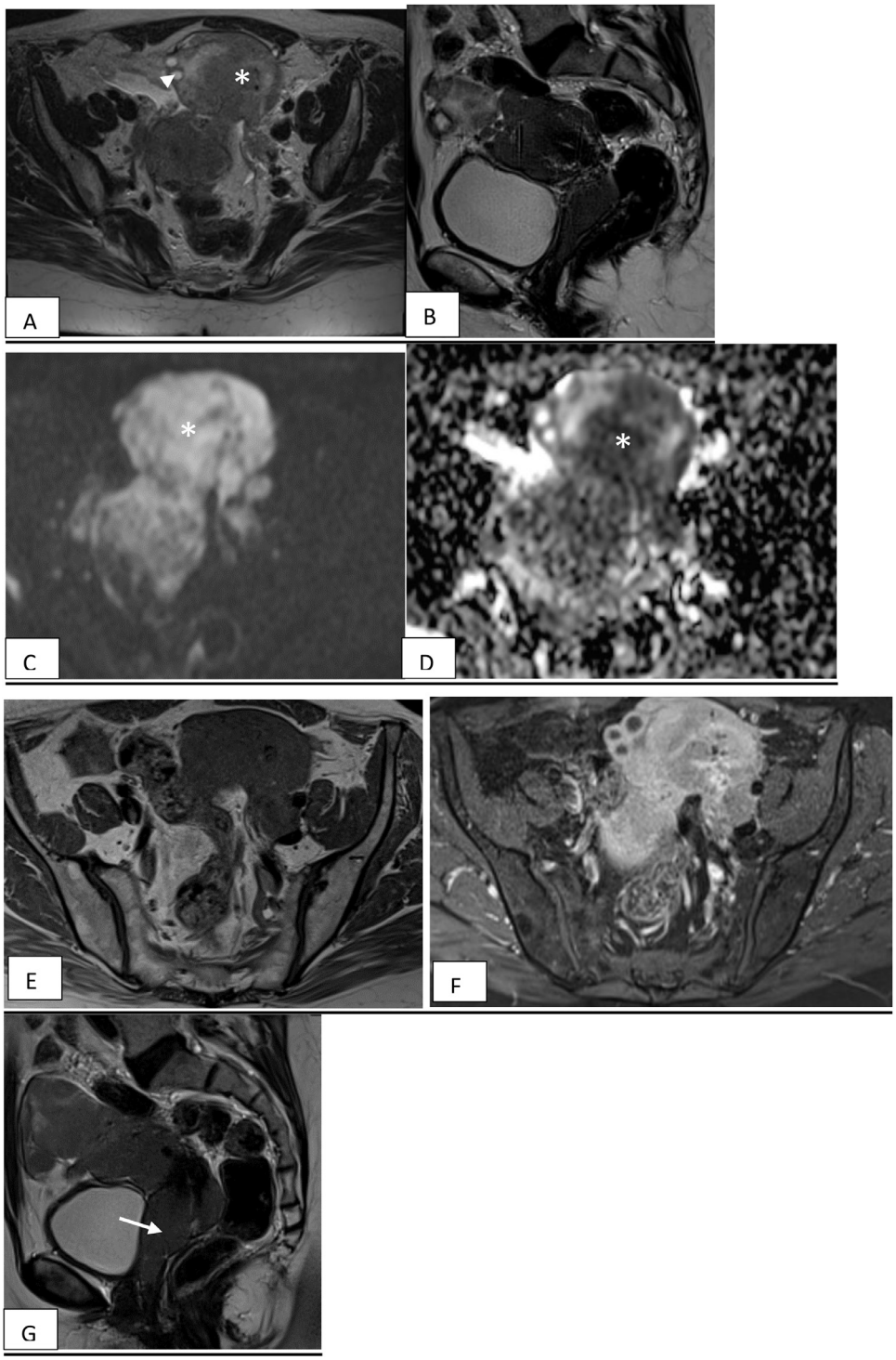

Fig. 1 – Pelvic MRI findings. (A) and (B) axial and sagittal T2 weighted images showed a poorly-defined left ovarian mass (asterisk) containing follicles (arrowhead), (C) and (D) axial diffusion weighted images and ADC maps showed a restricted diffusion with low ADC values. (E) and (F) axial T1 weighted images before and after gadolinium injection demonstrated a significant enhancement. (G) sagittal T2 weighted image revealed a diffuse homogeneous enlargement of the uterus more pronounced in the cervix (arrow).

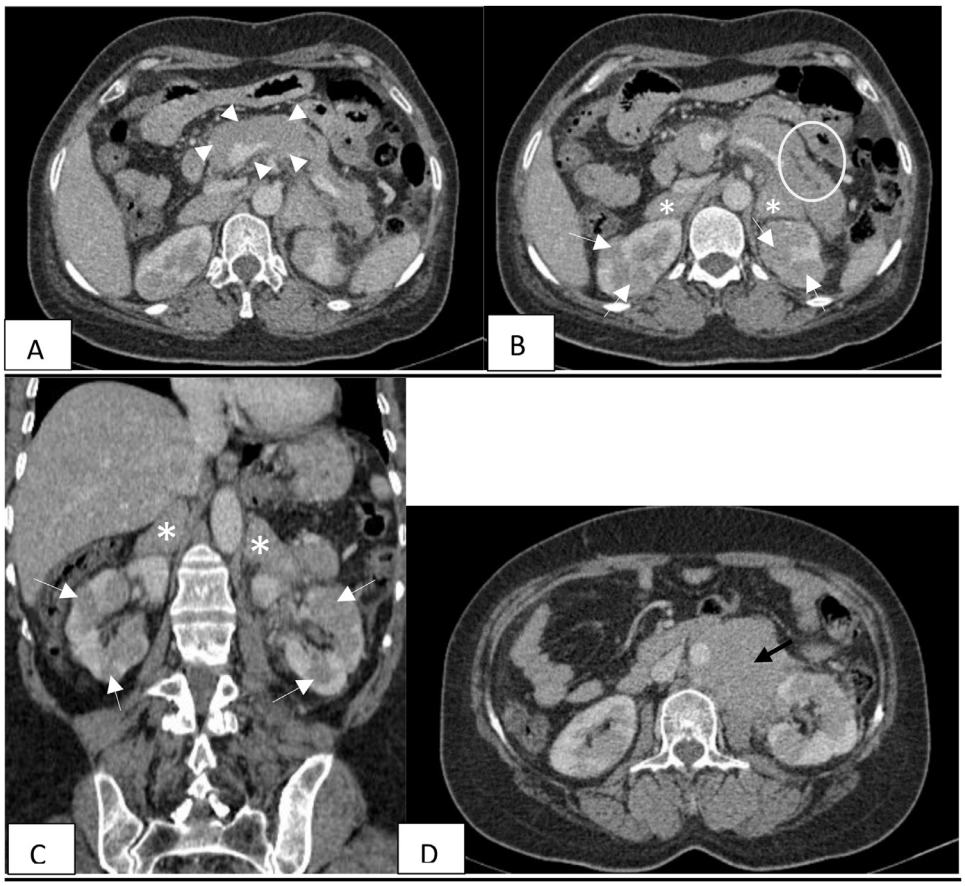

Fig. 2 – Axial and coronal views of CT scan. In images (A) and (B) Enlargement of the pancreatic body (arrowhead) with upstream dilatation of the pancreatic duct (circle). In images (B) and (C) Multiple hypodense masses in both kidneys (white arrow) with bilateral diffuse adrenal gland enlargement (asterisk). In image (D) Enlarged para-aortic lymph nodes (dark arrow).

resemble those of cervical carcinoma. A key diagnostic clue is the preservation of cervical epithelium despite extensive involvement of the cervical stroma, which contrasts with carcinoma. In cases involving the uterine body, diffuse enlargement of the uterus without disruption of the endometrial epithelium is also noted as a characteristic feature of lymphoma [2].

Kidney

Renal involvement by lymphoma typically occurs in systemic disease, as the kidney does not normally contain lymphoid tissue. It is most commonly observed in advanced stages of NHL. The prominent features of renal lymphoma include patent renal arteries and veins despite tumor growth. Different authors have described 3 patterns of renal involvement in lymphoma, with slight variations in their reported frequencies. Firstly, diffuse infiltration of the kidney appears as enlarged kidney with hypodense parenchyma in the early postcontrast phase on CT images. This infiltration pattern can resemble atypical growth patterns seen in renal cell carcinoma (RCC), severe pyelonephritis, or autoimmune and traumatic kidney processes. Secondly, solitary, focal, or multiple intraparenchymal renal masses that are hyperdense or hypoattenuating may be observed on CT scans (Figs. 2B and C). These nodular patterns can mimic conditions such as RCCs, metastatic disease, pyelonephritis, renal abscess, or IgG4-related renal disease. Thirdly, contiguous retroperitoneal lymphoma involving the kidney indicates invasion along the renal capsule or sinus. This can be visualized on imaging as a part of the lymphoma's spread in the retroperitoneal region [2,13,14].

Adrenal gland

The adrenal glands are an uncommon site for primary lymphoma, with involvement seen in approximately 4% of patients with NHL. Adrenal involvement in lymphoma is more frequent in NHL than in Hodgkin lymphoma (HL) across all age groups. It often manifests bilaterally in about 50% of cases and can lead to adrenal insufficiency due to disruption of adrenal function by the lymphoma. The main imaging feature of adrenal lymphoma can present as solid masses, but the most common presentation is diffuse bilateral enlargement of the adrenal glands (Figs. 2B and C) [2].

Pancreas

Pancreatic lymphoma is an uncommon form of NHL that primarily affects the pancreas. It predominantly involves the B-

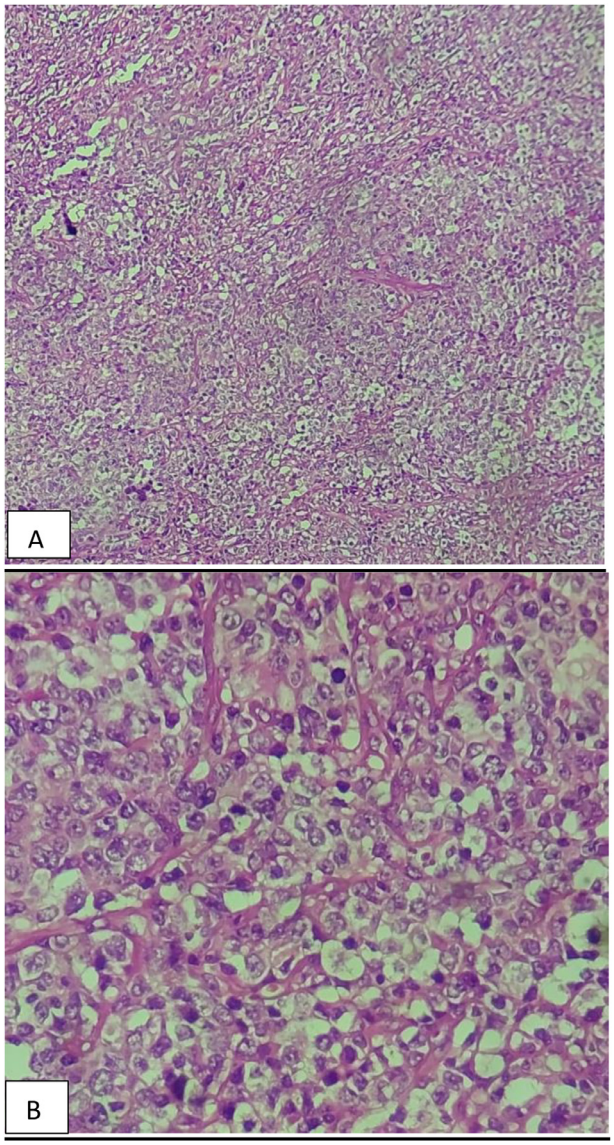

Fig. 3 – Pathological study: Diffuse proliferation of large lymphoid cells with round or oval vesicular nuclei, lymph node: HEx20 (A), HEx40 (B).

cell type of NHL. Pancreatic involvement occurs in over 30% of NHL cases and often results from direct infiltration from adjacent lymph nodes. There are 2 main morphological patterns of pancreatic lymphoma. One is characterized by a well-defined focal mass, while the other involves diffuse enlargement that infiltrates or replaces a significant portion of the pancreatic gland (Fig. 2A) [15,16].

Spleen

In the past, staging laparotomies frequently revealed splenic involvement in 30% to 40% of patients at initial presentation. NHL is recognized as the most prevalent tumor affecting the spleen in these cases. Splenic lymphoma exhibit several distinct patterns. First, splenomegaly characterized by homogeneous enlargement without a discrete mass. Second, solitary mass. Third, multifocal nodules, usually observed in NHL or in immunocompromised states. Fourth, diffuse infiltration [17,18].

Liver

Hepatic lymphomas can manifest as primary or secondary involvement of the liver. Primary hepatic lymphoma (PHL) is exceptionally rare and predominantly falls under the umbrella of NHL. It accounts for less than 1% of extranodal lymphomas. There are several patterns of hepatic involvement in lymphoma. The most common is diffuse infiltration of the liver or the presence of multiple hypodense lesions. Additionally, other presentations include large solitary masses that appear heterogeneous or hypodense. In some cases, a miliary pattern characterized by multiple small lesions (less than 1 cm in diameter) can also be observed in patients with hepatic lymphoma [3,4,19].

The gastrointestinal tract

Gastrointestinal (GI) tract lymphoma represents the most frequent type of extranodal non-Hodgkin lymphoma (NHL). However, the imaging characteristics observed on CT scans can vary widely [20]. Gastrointestinal non-Hodgkin lymphoma (gNHL) most commonly affects the stomach, followed by the small bowel and colon, with the esophagus being a rare site of involvement. Chronic Helicobacter pylori infection is a significant risk factor for gastric gNHL due to the chronic inflammation it causes in the stomach [1].

On CT imaging, findings of gNHL include polypoid masses, homogeneous bulky bowel wall or fold thickening, ulcers, pseudoaneurysmal dilatation, and occasionally a stenosing mass. Aggressive manifestations such as gastrointestinal bleeding, bowel obstruction, and perforation are uncommon. The absence of intestinal obstruction in gNHL is attributed to the lack of desmoplastic reaction seen in lymphoma, unlike in adenocarcinoma. Lymphoma typically invades the muscularis propria and disrupts the autonomic plexus, leading to aneurysmal bowel dilatation. These characteristics aid in distinguishing lymphoma from adenocarcinoma. However, gastric outlet obstruction syndrome and stenosing masses are rare presentations of gNHL. CT images showing bowel stenosis with dilatation upstream may suggest lymphoma involvement, especially when multiple enlarged perilesional lymph nodes (>1.5 cm) without necrosis are observed. In contrast, gastric cancer is associated with enlarged necrotic lymph nodes, and gastrointestinal stromal tumors typically do not metastasize to lymph nodes [1].

Conclusion

The aim of presenting this case report is to emphasize the importance of thoroughly analyzing imaging findings associated with ovarian masses and to consider the broader clinical context in the differential diagnosis. By sharing this case, we hope to enhance awareness of the diverse imaging features that can be indicative of less common conditions, such as lymphoma,

thereby supporting more accurate and comprehensive diagnostic approaches in the evaluation of ovarian masses.

Patient consent

The authors of this manuscript declare that an informed consent for publication of this case was obtained from the patient.

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