

MR Findings of a Primary Ovarian Lymphoma : A Case Report¹

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The imaging findings of primary ovarian lymphoma have not been reported, and, we therefore describe the MRI(magnetic resonance imaging) findings of a case of this disease, which manifested as bilateral lobulated solid masses with heterogenous signal intensity and central feeding vessels.

Index words : Ovary, neoplasms
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The involvement of the ovaries by lymphomatous or leukemic disease is well-known and occurs in 7-26 % of hematologic malignancies(1-3). In such cases, the ovarian disease is either an early manifestation of the systemic disease or a late complication.

Primary malignant lymphoma of the ovary, as an extranodal disease, is a rare phenomenon, the very criteria for which are somewhat controversial. Only a few cases have been reported and the diagnosis can be sustained only by the histological examination of the ovarian mass and long-term follow-up with no manifestation of a systemic lymphomatous disease(4-8). The imaging findings of primary ovarian lymphoma have not been reported, and we therefore describe the MRI(magnetic resonance imaging) findings of one case of this disease.

Case Report

A 27-year-old nulliparous female patient was admitted to our gynecologic clinic because of a palpable abdominal mass. On physical examination, the only abnormal finding was a huge pelvic mass measuring approximately 10cm in its longest diameter. Transvaginal ultrasonography(US) revealed a normal retroverted postpu-

bertal uterus and bilateral lobulated solid masses which measured $14 \times 10 \times 8$ cm and $9 \times 8 \times 3.5$ cm. MR(GE Signa, 1.5 tesla) imaging (Fig. 1) demonstrated the presence of bilateral adnexal masses, most probably of ovarian origin, and there was no evidence of peritoneal seeding or nodal metastasis. T1-weighted(TR= 600msec, TE= 11msec) sagittal MR images (Fig. 1A) revealed a relatively homogeneous hypointense mass with lobulated contour in the right adnexal mass. T2-weighted(TR= 4000msec, TE= 85msec) axial (Fig. 1B) images showed bilateral well-defined heterogeneous hyperintense adnexal masses. Enhanced sagittal MR(TR = 616msec, TE = 16msec) (Fig. 1C) obtained after intravenous injection of 0.1 mmol/kg Gd-DTPA(gadopentetate dimeglumine) demonstrated a clearly enhanced right adnexal mass with signal void from feeding vessels. Surgery revealed bilateral yellowish ovarian masses, measuring $15.5 \times 10 \times 8$ cm (right) and $9 \times 7.5 \times 4$ cm (left), with a smooth and glistening surface. These masses were easily separated from the uterus and urinary bladder. The uterus and cervix were normal. A total hysterectomy and bilateral salpingo-oophorectomy were performed. Using frozen sections of bilateral ovarian masses, small round cell tumor of both ovaries was diagnosed.

Gross inspection revealed that the right adnexal mass was yellowish and lobulated(Fig. 1D), and microscopic examination with H&E staining indicated that both ovaries which were diffusely infiltrated by a monotonous population of atypical lymphocytes. These were large lymphoid cells with cleaved and noncleaved nuclei,

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many of which had a conspicuous large, eosinophilic nucleolus. The lymphomatous infiltrate was surrounded by heavy lymphocytes admixed with plasma cells and eosinophils. The immunostaining using LCA(leukocyte common antigen) was strongly and diffusely positive, but cytokeratin, EMA(epithelial membrane antigen) and PAS(periodic acid-schiff) staining were negative.

Follow-up CT one and nine months after surgery revealed no evidence of local recurrence of a tumor or other lymphomatous lesion in other organs.

Discussion

In women with malignant lymphoma, lymphomatous involvement of the ovary is frequent, being found on autopsy in about 39 % of cases(5). However, primary involvement of the ovary by lymphoma is very rare(1-8).

In a review of 9500 cases of lymphomas by Chorlton et al.(1), in only 19 patients was there initial manifestation in the ovary. In another series of 1269 cases of ovarian tumor studied by Rotmensch et al.(9), only one case of primary ovarian lymphoma was found. Because of its rarity, similar clinical presentations, age-related factors and sometimes closely related pathological features, primary ovarian lymphoma is commonly misdiagnosed as one or other ovarian tumors. Common misdiagnoses are dysgerminomas and granulosa cell tumors(3), in which the treatment differs totally from that of lymphoma. Successful treatment of lymphoma depends on the institution of early chemotherapy. Like other ovarian tumors, lymphoma usually presents as a abdominal or pelvic mass and/or abdominal pain. Peripheral lymphadenopathy and B symptoms are rare. On laparotomy, bilateral ovarian involvement and the presence of

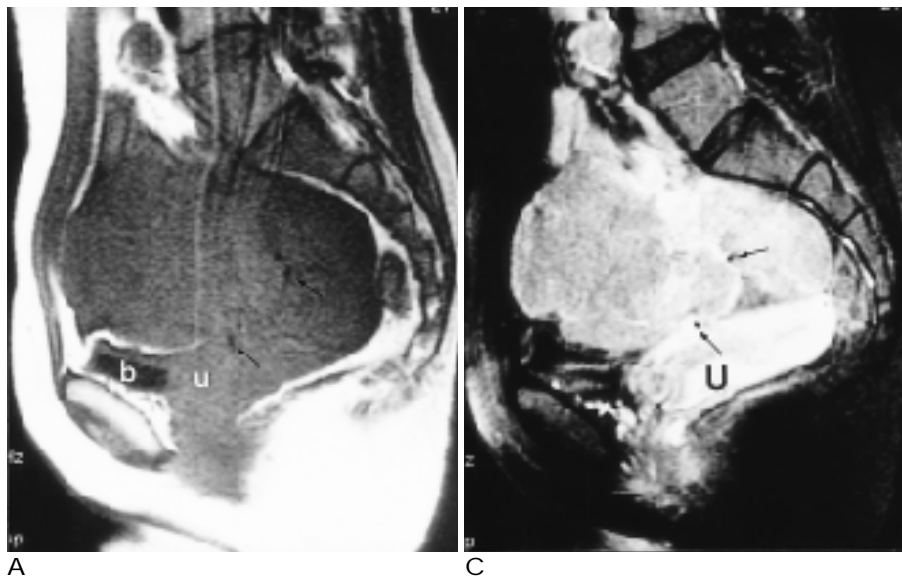


Fig. 1. Primary ovarian lymphoma in a 27-year-old nulli-parous female

A. T1-weighted sagittal image shows a relatively homogeneous hypointense mass with feeding vessels(arrows) in the pelvis superior to the uterus(u) and the urinary bladder(b).

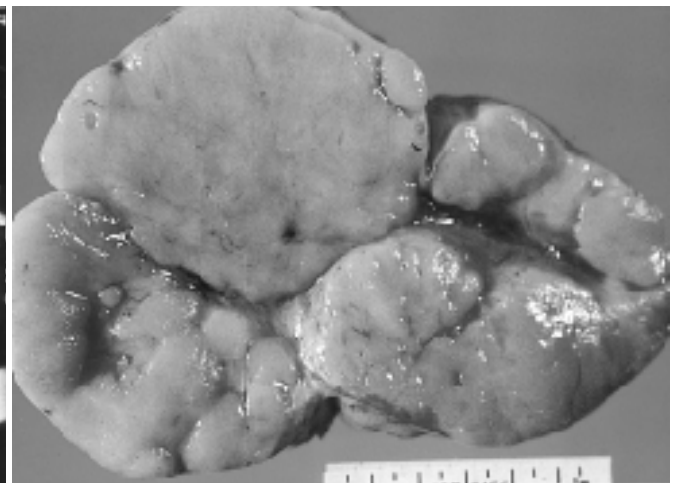
B. T2-weighted axial images show well-defined lobulated bilateral pelvic masses, which demonstrates heterogeneous hyperintense signal with feeding vessels(arrow).

C. Enhanced sagittal MR image with Gd-DTPA shows a well-enhancing adnexal mass with feeding vessels (arrows) compressing the uterus(U).

D. The gross specimen of a right adnexal mass shows a huge yellowish lobulated mass with multifocal hemorrhagic degeneration.



B



D

enlarged regional lymph nodes may give a clue to diagnosis, but these features are not specific for lymphoma (5). The differential diagnosis of ovarian lymphoma is problematic, leading to possible therapeutic inadequacies and adverse prognostic implications.

The imaging findings of ovarian lymphoma have not been reported. In any homogeneously hypoechoic organ, lymphoma generally presents as a homogeneous solid mass(10), and US reveals posterior sonic enhancement. The mass is seen as homogeneously hypointense on T1- and of variable intensity on T2- weighted MR images, and is somewhat enhanced(11-13). Primary ovarian lymphoma, in this case, did not simply appear as a homogeneous mass on US and MRI. Unlike dysgerminoma of the ovary(14,15), a fibrovascular bundle was not found, but small feeding vessels were seen in the form of a small round signal void on T1WI, T2WI and enhanced MR images. In some areas, demonstrated as high signal intensity on T2-weighted MR images, hemorrhagic degeneration was confirmed(Fig. 1B). This is also occasionally observed in dysgerminoma and granulosa cell tumor of the ovary(14,15). The other area of intermediate high signal intensity was attributable to the large amount of free water and relatively small proteinous portion of lymphoma cells, condition similar to those found in cases of uterine lymphoma(17,18). Like uterine lymphoma(18), this ovarian lymphoma showed clear enhancement.

In conclusion, we describe a case of primary ovarian lymphoma which was seen on MRI as clearly enhanced bilateral lobulated solid masses with heterogenous signal intensity and central feeding vessels.

References

1. Chorlton I, Norris HJ, King FM. Malignant reticuloendothelial disease involving the ovary as a primary manifestation. *Cancer* 1974;34:397-407
2. Fox H, Langley FA, Goan ADT, Hill SA, Bennet MH. Malignant lymphoma presenting as an ovarian tumor : a clinicopathological analysis of 34 cases. *Br J Obstet Gynecol* 1988;95:386-390
3. Osborne BM, Robboy SJ. Lymphomas or leukemias presenting as ovarian tumor - an analysis of 42 cases. *Cancer* 1983;52:1933-1943
4. Grisaru SG, Beller U, Gal M, Diamant YZ, Rosenmann E. Primary lymphoma of the ovary. : a case report and critical review of the literature. *Eur J Gynecol Oncol* 1993;16:392-395
5. Chrithrathara K, Gangadharan VP, Satish K, Abraham E, Cherian V, Nair MK. Non-Hodgkin 's lymphoma of the ovary - a case report. *Acta Oncologica* 1994;33:715-716
6. Ramachandrah P, George G. Primary lymphoma of the ovary resembling Burkitt lymphoma - a case report with review of the literature. *Indian J Cancer* 1979;16:143-146
7. Piura B, Bar-David J, Clezerman M, Zirkkin HJ. Bilateral ovarian involvement as the only manifestation of malignant lymphoma. *J Surg Oncol* 1986;33:126-128
8. Paladugu RR, Bearman RM, Rappaport H. Malignant lymphoma with primary manifestation in the gonad. A clinicopathologic study of 38 patients. *Cancer* 1980;45:561-571
9. Rotmensch J, Woodruff ID. Lymphoma of the ovary. Report of 2 new cases and update of previous series. *Am J Obstet Gynecol* 1982;143:870-875
10. Miannay E, Detournignies L, Decocq J, Delobelle A, Robert Y. Malignant Non-Hodgkins lymphoma manifested in an ovarian tumor. Five case reports. *J Gynecol Obstet Biol Reprod* 1997; 26(4): 424-429
11. Boukobza M, Mazel C, Touboul E. Primary vertebral and spinal epidural non-Hodgkin 's lymphoma with spinal cord compression. *Neuroradiology* 1996;38:333-337
12. Semelka RC, Klekis NL, Burdeny DA, Mitchell DG, Brown JJ, Siegelman ES. Renal lymphoma : demonstration by MR imaging. *AJR* 1996;166:823-827
13. Forsgren G, Nyman R, Glimelius B, Hagberg H, Rehn S, Hemmingsson A. Gd-DTPA-enhanced MR imaging in mediastinal Hodgkin 's disease. *Acta Radiol* 1994;35:564-560
14. Tanaka YO, Kurosaki Y, Nishida M, Michishita N, Kumamoto K, Itai Y, Kubo T. Ovarian Dysgerminoma : MR and CT appearance. *J Comput Assist Tomogr* 1994;18(3):443-448
15. Kim SH, Kang SB. Ovarian Dysgerminoma : Color Doppler ultrasonographic findings and comparison with CT and MR imaging findings. *J Ultrasound Med* 1995;14(11):848-848
16. Morikawa K, Hatabu H, Togashi K, Kataoka ML, Mori T, Konishi J. Granulosa cell tumor of the ovary : MR findings. *J Comput Assist Tomogr* 1997;21(6):1001-1004
17. Lien HH, Nome O, Berner A. Lymphoma of the uterus : findings on MR imaging. *AJR* 1994;163(4):996
18. Kawakami S, Togashi K, Kojima N, Morikawa K, Mori T, Konishi J. MR appearance of malignant lymphoma of the uterus. *J Comput Assist Tomogr* 1995;19(2):238-242