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Cutaneous Anaplastic Large Cell Lymphoma: A Rare Thigh Localization

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Abstract

Cutaneous anaplastic large cell lymphoma (C-ALCL) is a rare type of non-Hodgkin lymphoma that primarily affects the skin. It accounts for a small percentage of cutaneous lymphomas and is characterized by solitary or multiple nodules, often localized, and rarely associated with systemic involvement. This condition is exceptionally rare in pediatric populations.

We report the case of a 13-year-old boy presenting with a painless swelling in the right thigh. Initial evaluation with ultrasound revealed a suspicious mass, prompting further investigation with a thoracoabdominal-pelvic (TAP) CT scan to better characterize the lesion and assess for potential additional sites. Histological analysis of a biopsy confirmed the diagnosis of cutaneous anaplastic large cell lymphoma. This case highlights the importance of early imaging and histological evaluation in the diagnosis of rare cutaneous lymphomas, especially in atypical pediatric presentations.

Keywords:

Cutaneous anaplastic large cell lymphoma , pediatric lymphoma , thigh mass, non-Hodgkin lymphoma, histological diagnosis, imaging in lymphoma

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Main Article

Introduction:

Cutaneous anaplastic large cell lymphoma (ALCL) is a rare subtype of CD30+ T-cell lymphoma, accounting for a small percentage of cutaneous T-cell lymphomas. It typically manifests as solitary or localized skin lesions and is more commonly seen in adults, with limited cases reported in pediatric populations. Primary cutaneous ALCL generally has a favorable prognosis, but early diagnosis through imaging and histological examination is crucial for effective management [1,2,3]. In this report, we describe a rare case of primary cutaneous ALCL localized to the right thigh in a 13-year-old boy, highlighting the importance of diagnostic imaging and histological confirmation .

Case report:

A 13-year-old male presented to the clinic with complaints of pain in his lower limbs, particularly in the right thigh. The pain had been persistent for several weeks, and no recent trauma was reported. Due to the severity and prolonged nature of the symptoms, an ultrasound was performed to further investigate the underlying cause. The ultrasound revealed a heterogeneous mass located in the right thigh, measuring approximately 8x7 cm. The mass showed both tissue and fluid components, and there was weak Doppler color flow observed within the lesion. These findings raised concerns for a potential pathological mass requiring further imaging.

To better assess the extent of the lesion and its characteristics, a thoracoabdominal-pelvic (TAP) CT scan was performed. The scan revealed an ovoid, well-circumscribed mass affecting the vastus intermedius and right femoral muscles. The mass was homogeneous in shape but displayed heterogeneous enhancement after the administration of contrast material, suggesting necrotic areas within the lesion. These areas of necrosis were particularly prominent around the femoral diaphysis, leading to cortical irregularities and a multilamellar periosteal reaction along the femur. The mass was found to displace the superficial femoral vessels, though without direct invasion of the vessels themselves. Additionally, bilateral external iliac lymphadenopathy was

observed, which suggested regional spread of the disease.

Given the nature and appearance of the mass, a biopsy was performed to confirm the diagnosis. Histological examination of the biopsy specimen revealed the presence of large, atypical CD30+ cells, confirming the diagnosis of primary cutaneous anaplastic large cell lymphoma (ALCL). This diagnosis was consistent with the clinical and radiological findings, highlighting the importance of a multidisciplinary approach in diagnosing rare and atypical cases of lymphoma in pediatric patients.

Discussion

Anaplastic large cell lymphoma (ALCL) is a rare, aggressive T-cell lymphoma, often presenting in the skin but also involving other organs[4].. It is characterized by large, pleomorphic cells with abundant cytoplasm and distinct nuclear shapes[5;6].. Imaging, including ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI), is crucial for assessing the extent of the disease.

Ultrasound (US) is often the first imaging modality, revealing heterogeneous masses with both solid and fluid components, indicating rapid tumor growth and necrosis. Doppler ultrasound may show increased vascularity, which is typical of ALCL. In this case, the ultrasound identified a heterogeneous mass in the thigh, with both tissue and fluid components, characteristic of the aggressive nature of the disease. CT is used for more detailed evaluation and can highlight the heterogeneous enhancement of the mass after contrast administration, indicating vascularity and necrosis. The CT scan performed in this case revealed a well-defined mass in the thigh muscles, with necrotic zones and vascular involvement, which are consistent with ALCL's behavior. It also helped detect associated regional lymph node enlargement.

MRI typically shows thickened skin with a high signal on T2-weighted images and heterogeneous enhancement after contrast, which helps delineate the mass boundaries. In this case, the MRI revealed thickening of the skin with nodular lesions and heterogeneous enhancement, consistent with ALCL. MRI also helps assess deeper tissue involvement, such as muscles and bones, and can detect infiltration into surrounding structures. This was observed in the present case, where the mass was

found to involve the underlying muscles and cortical irregularities.

In general, imaging findings such as heterogeneous enhancement, necrosis, and regional lymphadenopathy are indicative of ALCL, and these modalities help guide diagnosis, staging, and treatment planning.

CONCLUSION

Anaplastic large cell lymphoma (ALCL) is a rare and aggressive T-cell lymphoma that can present with characteristic imaging features, including heterogeneous masses, necrosis, and vascular enhancement. Ultrasound, CT, and MRI play essential roles in diagnosing, staging, and assessing the extent of the disease. In this case, imaging findings aligned with the typical characteristics of ALCL, aiding in the identification of the tumor and its involvement with surrounding structures. Early detection and accurate imaging are crucial for effective treatment planning and improving patient outcomes.

Figures :

Figure 1: Ultrasound showing a large, irregular, heterogeneously echogenic mass within the uterine cavity with rich vascularization on Doppler, consistent with a hydatidiform mole.

Figure 2 Pelvic MRI (T2-weighted) showing a heterogeneously hyperintense mass occupying the uterine cavity, extending to the lower third of the vagina. Diffusion-weighted imaging (DWI) shows restricted diffusion, with corresponding low ADC values, confirming the presence of a highly cellular lesion consistent with a vaginal hydatidiform mole

Figure 3 : Pelvic MRI (T1 dynamic fat-sat) demonstrating heterogeneous enhancement of a lesion occupying the uterine cavity, with notable post-contrast enhancement extending to the lower third of the vagina.

Figure 4 Axial CT scan of the chest revealing multiple metastatic lesions in the lungs, displaying the characteristic "balloon-like" appearance, consistent with pulmonary metastases from the hydatidiform mole.

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