CASE REPORT

Pediatric Cervical Hodgkin’s Lymphoma Diagnosed by Ultrasound-guided Core Needle Biopsy

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Hodgkin’s lymphoma is the most common pediatric head and neck malignancy, often presenting as cervical lymphadenopathies. Here, we report a case of a 12-year-old boy with a right painless neck mass for 2 weeks. Sonographic examination revealed ill-defined confluent lymphadenopathies over the right neck. We then applied ultrasound-guided core needle biopsy on the cervical mass under local anesthesia and achieved the final diagnosis of Hodgkin’s lymphoma, thus preventing the risks of open excisional biopsy.

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Introduction

Hodgkin’s lymphoma is the most common pediatric head and neck malignancy (31% of total pediatric malignancies) [1]. It is a hematopoietic malignancy that mainly affects adolescents and young adults, with a male-to-female ratio of 2:12 [2]. More than 80% of patients with Hodgkin’s lymphoma present with cervical lymphadenopathy [1]. The classic presentation is an asymmetric, firm, and nontender neck mass [1]. From 30% to 40% of patients have systemic symptoms, including weight loss, fever, and night sweats [1]. Traditionally, lymphoma in the head and neck has been diagnosed by excisional biopsy [3]. However, in recent years, there is increasing evidence that ultrasound-guided core needle biopsy (US-CNB) can also sample sufficient tissue for diagnosis of lymphoma [3]. Here, we report a case of cervical Hodgkin’s lymphoma diagnosed by US-CNB.

Case report

A 12-year-old Asian boy initially presented at our clinic with a right painless neck mass noted of 2 weeks duration. There was no history of fever, night sweats, or body weight loss. A physical examination revealed one fixed cervical mass,
measuring 6 cm × 3 cm, at the right level IV cervical region. An otolaryngology examination showed a normal appearance of bilateral tonsils and some adenoid vegetation. There were no other lymphadenopathies palpable over the body, and the rest of the physical examination was unremarkable. The patient was then referred for a sonographic evaluation.

The head and neck ultrasound examination was then performed using a 12-MHz linear probe (Toshiba Aplio SSA 790, Toshiba Medical Systems, Tochigi-ken, Japan). Ultrasonography revealed one enlarged, ill-defined, confluent, hypoechoic, and heterogeneous mass lesion over the right level III–IV region with some pseudocystic appearance (Fig. 1). The lesion had no obvious hilus structure and no calcification. However, multiple enlarged, well-defined, hypoechoic, and homogeneous lymphadenopathies were noted over the right level II–III region (Fig. 2). Under sonographic guidance and local anesthesia, 18-gauge core needle biopsies were performed twice on the right cervical mass lesion.

A histopathological examination revealed many large bizarre neoplastic cells, which tested positive for CD15 and CD30, and negative for other B- and T-cell markers and CD45. The lesion was not associated with Epstein-Barr virus infection. Fibrosis was abundant. The final diagnosis was classical Hodgkin’s lymphoma, nodular sclerosis type.

Blood work revealed an elevated white cell count (14,480/μL) with 79% segments and 13.5% lymphocytes. The hemoglobin level was 11.7 g/dL and the platelet count was 463,000/μL. The patient was then referred to the pediatric medical center for further evaluation and treatment.

Discussion

In the majority of children, cervical lymphadenopathy represents a benign, self-limited inflammatory process; however, the differential diagnosis must include more severe systemic disease or malignancy [4]. Ultrasound is ideally suited for the first-line investigation of neck lymphadenopathy [5]. The great advantage of ultrasound is that it is easily combined with ultrasound-guided biopsy—fine-needle aspiration or core biopsy [5]. Several features may be used in ultrasound to discriminate between benign and malignant nodes, including size, shape, location, margin, echotexture, and the presence of

Fig. 1 Enlarged, ill-defined, confluent, hypoechoic, and heterogeneous mass lesion over right level III–IV cervical region with some pseudocystic appearance. CCA = common carotid artery; SCM = sternocleidomastoid muscle.

Fig. 2 Multiple enlarged, well-defined, hypoechoic, and homogeneous lymphadenopathies over right level II–III cervical region. CCA = common carotid artery; SCM = sternocleidomastoid muscle.
necrosis [6]. For lymphomatous lymph nodes, the size varies significantly, but is usually >10 mm in transverse diameter [7]. Lymphomatous nodes tend to be round in shape, well-defined, homogeneous, appear hypoechoic, and are usually without an echogenic hilus [7]. A pseudo-cystic appearance and posterior acoustic enhancement are characteristic features of lymphomatous nodes [7]. However, lymphomatous nodes seldom show cystic necrosis and intranodal calcification [7]. The distribution of lymphomatous nodes seems to have a consistent pattern of submental, submandibular, and upper deep cervical chain involvement [6]. Power Doppler sonography may sometimes demonstrate an exaggerated hilar vascular pattern in a lymphomatous node [6]. Although some features of lymphoma are evident in ultrasonography, it is still difficult to differentiate lymphoma from metastatic carcinoma by sonography alone. Also, there are no useful criteria in an ultrasound image to differentiate Hodgkin’s from non-Hodgkin’s lymphoma. The ultimate diagnosis in any case still relies on the “gold standard” of histopathology [2].

Lymphoma has traditionally been diagnosed by the surgical excisional biopsy of an involved node [3]. However, operative node excision does require the input of surgical, nursing, anesthetic, and theatre staff, which add considerable cost as well as anesthetic and surgical risks [8]. For these reasons, as an alternative method, core biopsy using ultrasound guidance is now a well-established technique widely used in sampling head and neck masses [3]. Early studies suggested that core biopsy could only fully classify lymphoma in 38–51% of cases [9]. More recent work has suggested full subclassification in 72–96% of lymphoma patients [10]. Burke et al [3] found a variation in the diagnostic yield for different types of lymphoma, with 31/37 (84%) of diffuse large B-cell lymphomas conclusively diagnosed by needle core biopsy but only 8/16 (50%) of Hodgkin’s lymphomas. This probably reflects a greater heterogeneity in histological appearance across the lymph node in Hodgkin’s lymphoma, with the consequent risk of sampling variation and the chance that critical features such as Reed–Sternberg cells might not be present in the core [11]. Burke et al [3] also found that 14-G biopsies achieved a higher diagnostic yield than 18-G biopsies (89% vs. 68%), which suggests that where possible the larger gauge needle should be used.

The ultrasound characteristics of our case are not fully compatible with the classical features of lymphomatous nodes. This may attribute to the gigantic size and confluent phenomenon of lymphomatous nodes. To differentiate metastatic carcinoma from lymphomatous nodes, biopsy is fundamental to achieve final diagnosis. Though ultrasound-guided core needle biopsy cannot fully classify lymphoma, especially Hodgkin’s lymphoma, which is the most common pediatric head and neck malignancy, it is still an effective method giving us sufficient information for diagnosis most of the time. Ultrasound-guided core needle biopsy is still an appropriate first-line method for the diagnosis of cervical lymphadenopathies.

References