Supraclavicular Lymphadenitis Following COVID-19

Raid M. Al-Ani (✉ med.raed.alani2003@uoanbar.edu.iq)

University Of Anbar, College of Medicine, Department of Surgery/Otolaryngology

<https://orcid.org/0000-0003-4263-9630>

Rasheed Ali Rashid

Tikrit University, College of Medicine, Department of Surgery/Otolaryngology

Case Report

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Abstract

Introduction

Cervical lymphadenopathy in children is a common problem in daily clinical practice. Many cases of cervical lymphadenopathy after the COVID-19 vaccine were reported. However, there is no yet reporting a case of supraclavicular cervical lymphadenopathy as a result of COVID-19.

Case presentation

A 12-years-old girl presented with fever, cough, fatigue, anosmia, and ageusia. COVID-19 was confirmed by real-time PCR. The symptoms were resolved within 10 days. After 7 days, she complained of supraclavicular swelling. Physical examination revealed painless, multiple, and mobile supraclavicular lymph nodes. Ultrasound and fine-needle aspiration cytology were suspicious. Therefore, an excisional biopsy of the largest node was performed. The specimen was sent for histopathology and immunohistochemistry evaluation which confirmed the benign nature of the lymph node.

Conclusion

To our best knowledge, this is the first case of supraclavicular lymphadenopathy in a child with COVID-19. It is essential to put COVID-19 in the differential diagnosis of cervical lymphadenopathy.

Introduction

There are various otorhinolaryngological manifestations as a result of the COVID-19 pandemic, including, but not limited to, smell and taste abnormalities, dysphonia, hearing loss, sore throat, nasal obstruction, and parotitis [1][2][3].

The neck is the joining part between the head and body. There are various causes of neck masses, these are broadly divided into three groups congenital or developmental, inflammatory (infectious or non-infectious), and tumors [(benign or malignant (primary or secondary))].

Many viruses, particularly in the pediatric population, may cause cervical lymphadenopathies like adenovirus, Epstein bar virus, herpes virus, coxsackievirus, and cytomegalovirus. Moreover, cervical lymphadenopathy following COVID-19 vaccines was reported [4][5]. Distinguin et al. reported three COVID-19 patients with cervical lymphadenopathy in level II (upper jugular group) [6]. However, there is no reported case of supraclavicular cervical lymphadenopathy as a result of COVID-19. We reported the first case of supraclavicular lymph node enlargement in a 12-years-old girl following the COVID-19 disease.

Case Presentation

A 12-years-old female presented with a neck mass in the right supraclavicular area of one-month duration. The patient had a history of contact with her infected grandmother with COVID-19. She

complained of fever (38.5°C), dry cough, fatigue, and loss of smell and taste. She consulted a doctor and gave her advice on bed rest and home quarantine from her family members after sending her for a real-time PCR test of the nasopharyngeal swab. The test was positive for SARS-CoV-2. Chest X-ray revealed a right-sided upper zone pneumonic patch. Supportive treatment in form of antipyretic and tonic as well as antibiotics was given. The patient became well and all presenting symptoms disappeared completely at the 10 days follow-up period. After one week, there was an appearance of a right supraclavicular lump which was painless and gradually increase in size Fig. 1. Physical examination revealed a non-tender neck mass in the right supraclavicular region, oval in shape, 2 x 1.5 cm, freely mobile, no scar, and no skin changes over the swelling or surrounding areas. There were no focal infective areas or masses or other lymph node enlargement in the body. The patient took a 5 days antibiotic course but without benefit. Ultrasound examination revealed multiple cervical lymph nodes in the right supraclavicular area, the largest one of 19x14 mm in diameter. These nodes showed abnormal fatty hilum and abnormal round index as well as exaggerated hypo-echoic texture as shown in Fig. 2. The possible differential diagnosis could be infectious mononucleosis, toxoplasmosis, cytomegalovirus infection, and less likely lymphoma. No abnormalities were found on abdominal and axillary sonographic examination. Laboratory tests revealed all are normal apart from high IgM against SARS-CoV-2 and lymphocytosis. Fine needle aspiration cytology revealed a suspicion of abnormal cells. Excisional biopsy was subjected to histopathological examination and immunohistochemistry study. These examinations revealed reactive hyperplasia with no abnormal cells (Figs. 3 and 4). At the 2-months follow-up visit, there was no recurrence of the lesion and the patient did her normal daily living well. The possible cause of her neck swelling was COVID-19 owing to the clinical presentation of the patient, positive real-time PCR test of the nasopharyngeal swab, the result of the serological test of SARS-Cov-2, and no features on physical examination and investigation supported other causes as listed in the differential diagnosis. The parents gave informed consent to publish the case.

Discussion

The head and neck contain around 2/3rd of the lymph nodes in the body. Besides, the inflammatory or malignant process in any area can reach the neck through the lymphatic system. Therefore, there is a huge list of causes of cervical lymphadenopathy (enlargement of a node > 1 cm in diameter). Cervical lymphadenopathy is common in the pediatric population, and most of the cases are benign. The first systematic review about the causes of cervical lymphadenopathy in children of Deosthali et al. [7] reported that 67.8% of the 2687 cases are due to nonspecific benign causes, followed by Epstein-Barr virus (8.86%), malignancy (4.69%), and granulomatous disease (4.06%). In the presenting case, the histopathology and immunohistochemistry evaluations revealed the reactive benign nature of the supraclavicular lymph node. The high possible cause of this cervical lymphadenopathy was COVID-19 because the patient was diagnosed as COVID-19 by real-time PCR of the nasopharyngeal swab and high IgM as well as an absence of indicators of other pathologies in the history, examination, and investigations. Accordingly, COVID-19 can lead to reactive cervical lymph node enlargement.

Involvement of the axillary and/or supraclavicular lymph nodes on the same side is a frequent adverse effect of the vaccines against COVID-19. This is due to local activation of the immune response [8][9][10]. Moreover, Distinguin et al. reported 3 cases of cervical lymphadenopathy in group II (upper jugular group) on magnetic resonance imaging (MRI) in patients with COVID-19. All those patients have complained of otorhinological symptoms (anosmia, aguesia, nasal obstruction, rhinorrhea, and sore throat). These symptoms due to inflammation of the nose, nasopharynx, and oropharynx that caused by SARS-CoV-2. As a result of this inflammation, a local immune reaction occurs, resulting in lymph node enlargement of the Waldeyer's ring, neck, and parotid regions [6]. Interestingly, we presented the first case in the world of unilateral supraclavicular enlargement in a patient with COVID-19. Although the mechanism of supraclavicular lymphadenopathy is obscure, it is of utmost importance to put the COVID-19 in the differential diagnosis of supraclavicular lymphadenopathy.

Identification of the possible ways of the transmission of the SARS-CoV-2 has a major role in understanding the mechanism of the infection with its further treatment options. The specific coronavirus receptor (ACE-2 receptor) is distributed in all body tissues, including the lymph nodes [11], therefore, it is possible to find the virus in the lymph node as in the presenting case, leading to inflammation and enlargement of the node. Another possible mechanism of getting enlargement of the supraclavicular lymph node is a local immune response in the lung.

According to the American College of Radiology (ACR) recommendations, chest X-ray and computerized tomography (CT) should not be used as a screening or first diagnostic tool of the COVID-19 owing to the similarity of the radiological signs among various lung conditions. However, radiological investigation in the pediatric population plays an essential tool for moderate and severe forms of COVID-19 (as a baseline, assessment of complications, and assessment of treatment response or progression of the disease). Moreover, chest X-ray is considered the first radiological investigation in children, and CT scan is reserved for suspicious cases of pulmonary embolism or worsening clinical condition [12]. Pulmonary abnormalities in children are unilateral in 55% and bilateral in 45% of affected children [13] and about 8% are affected the right upper lobe of the lung [14] which was a similar finding of our patient.

Cervical lymphadenopathy following COVID-19 is extremely rare. However, it can put on the long list of differential diagnoses which include infections and primary tumor (lymphoma) or secondary malignant lymph node. Radiological investigations in the form of sonography or MRI as a diagnostic tool should be performed when there are suspicious findings on physical examination.

As reported in the literature, supraclavicular lymphadenopathy after taking the COVID-19 vaccine affects mostly females and occurs in up to 24 days (mostly in the first 10–15 days). It gradually subsides within 4–6 weeks [15]. Our case presented with features of COVID-19 (fever, fatigue, cough, and loss of smell and taste) for 10 days, and the disease was confirmed by a real-time PCR test of the nasopharyngeal swab. Seven days following the resolution of the symptoms, there was an appearance of right-sided supraclavicular lymphadenopathy. Supraclavicular lymphadenopathy in children, particularly if persists for more than two weeks, carries a sinister pathology [16], therefore we subjected the child to an

excisional biopsy which revealed a benign nature of the lesion on the histopathological and immunohistochemical evaluation. Accordingly, the supraclavicular lymphadenopathy in the presenting case was highly suspicious that the COVID-19 was a cause.

Conclusion

Supraclavicular lymphadenopathy due to COVID-19 was never reported in the literature. However, it might be a side effect of the COVID-19 vaccine. Besides, cervical lymphadenopathy in level II was reported. This is the first case in the world of supraclavicular lymphadenopathy due to COVID-19 in a child. Therefore, it is necessary to ask the patients with cervical lymphadenopathy whether they have gotten COVID-19 recently.

Declarations

Acknowledgment

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Conflict of Interest

The authors declare that there is no conflict of interest.

References

1. R. M. Al-Ani, "Smell and Taste Abnormalities due to COVID-19," *Al-Anbar Med. J.*, vol. 16, no. 1, pp. 1–2, 2020.
2. J. R. Lechien *et al.*, "Parotitis-like symptoms associated with COVID-19, France, March–April 2020," *Emerg. Infect. Dis.*, vol. 26, no. 9, p. 2270, 2020.
3. G. Cantarella *et al.*, "Prevalence of Dysphonia in Non hospitalized Patients with COVID-19 in Lombardy, the Italian Epicenter of the Pandemic," *J. Voice*, 2021.
4. B. Kim, Y. Park, E. K. Kim, and S. H. Lee, "Supraclavicular lymphadenopathy after COVID-19 vaccination in Korea: serial follow-up using ultrasonography," *Clin. Imaging*, 2021.
5. O. R. Mitchell, R. Dave, J. Bekker, and P. A. Brennan, "Supraclavicular lymphadenopathy following COVID-19 vaccination: an increasing presentation to the two-week wait neck lump clinic?," *Br. J. Oral Maxillofac. Surg.*, vol. 59, no. 3, pp. 384–385, 2021.
6. L. Distinguin *et al.*, "MRI of Patients Infected With COVID-19 Revealed Cervical Lymphadenopathy." SAGE Publications Sage CA: Los Angeles, CA, 2020.

7. A. Deosthali, K. Donches, M. DelVecchio, and S. Aronoff, "Etiologies of pediatric cervical lymphadenopathy: a systematic review of 2687 subjects," *Glob. Pediatr. Heal.*, vol. 6, p. 2333794X19865440, 2019.
8. C. D. Lehman, H. A. D'Alessandro, D. P. Mendoza, M. D. Succi, A. Kambadakone, and L. R. Lamb, "Unilateral lymphadenopathy after COVID-19 vaccination: a practical management plan for radiologists across specialties," *J. Am. Coll. Radiol.*, vol. 18, no. 6, pp. 843–852, 2021.
9. M. Fernández-Prada, I. Rivero-Calle, A. Calvache-González, and F. Martínón-Torres, "Acute onset supraclavicular lymphadenopathy coinciding with intramuscular mRNA vaccination against COVID-19 may be related to vaccine injection technique, Spain, January and February 2021," *Eurosurveillance*, vol. 26, no. 10, p. 2100193, 2021.
10. N. Mehta *et al.*, "Unilateral axillary Adenopathy in the setting of COVID-19 vaccine," *Clin. Imaging*, vol. 75, pp. 12–15, 2021.
11. I. Hamming, W. Timens, M. L. C. Bulthuis, A. T. Lely, G. J. van Navis, and H. van Goor, "Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis," *J. Pathol. A J. Pathol. Soc. Gt. Britain Irel.*, vol. 203, no. 2, pp. 631–637, 2004.
12. A. M. Foust *et al.*, "Practical guide for pediatric pulmonologists on imaging management of pediatric patients with COVID-19," *Pediatr. Pulmonol.*, vol. 55, no. 9, pp. 2213–2224, 2020.
13. G. F. Parisi, C. Indolfi, F. Decimo, S. Leonardi, and M. M. Del Giudice, "COVID-19 pneumonia in children: from etiology to management," *Front. Pediatr.*, vol. 8, 2020.
14. F. Palabiyik, S. O. Kokurcan, N. Hatipoglu, S. O. Cebeci, and E. Inci, "Imaging of COVID-19 pneumonia in children," *Br. J. Radiol.*, vol. 93, no. 1113, p. 20200647, 2020.
15. A. S. Becker *et al.*, "Multidisciplinary recommendations regarding post-vaccine adenopathy and radiologic imaging: radiology scientific expert panel," *Radiology*, p. 210436, 2021.
16. S. Lang and B. Kansy, "Cervical lymph node diseases in children," *GMS Curr. Top. Otorhinolaryngol. Head Neck Surg.*, vol. 13, 2014.

Figures

Figure 1

Shows the right side of the neck with supraclavicular swelling in a 12-years-old girl.

Figure 2

Grayscale ultrasound of the neck shows abnormal-looking lymph nodes evident by exaggerated hypoechoic echotexture and lost fatty hilum. The largest one 18 x10 mm in diameter.

Figure 3

Shows a benign reactive lymph node, which has a mantle zone (red arrow) that is surrounding a pale germinal center (blue arrow). A) H&E X 40 and B) H&E X 100.

Figure 4

Shows positive immunohistochemical (IHC) expression of BCL-2 in the mantle zones and negative brownish discoloration of the nuclear and cytoplasmic stain. Besides, positive IHC expression of BCL-6 in the germinal centers of the lymph node with reactive hyperplasia, with a brownish discoloration of the nuclear stain.