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Case Report

Pediatric thyroid abscess: an unusual late complication of COVID-19 infection

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ABSTRACT

Coronavirus disease 2019 (COVID-19) infection in children usually presents as mild infection. There have been several reported papers of thyroid dysfunction in adults suffering from SARS-CoV-2 infection but there hasn't been any reported case in pediatric population. We report first pediatric case of post COVID-19 thyroid abscess that developed 6 weeks post infection.

Keywords: Thyroid abscess, Pediatric COVID disease, SARS-CoV-2 infection, Thyroid dysfunction

INTRODUCTION

Coronavirus disease 2019 (COVID- 19) infection affects children of all age groups and majority of times the infected children have mild or no symptoms of disease and are managed by supportive care. Scrutiny of literature revealed that the most frequent complication of COVID-19 in children is multisystem inflammatory syndrome (MISC-C) followed by neurological complications. It has been reported that SARS-CoV-2 may induce thyroid dysfunction in adults that is usually reversible, including subclinical and atypical thyroiditis.[1] This might be due to hypersensitive immune response in these patients that might cause inflammation and dysfunction of the thyroid. While children may theoretically be at risk, thyroid disease in children with COVID-19 infection has not been reported.[2]

We here present an interesting and not yet reported case of pediatric thyroid abscess following COVID-19 infection. To best of our knowledge this is the first case to be reported in English literature.

CASE REPORT

We report a case of a 3-year-old child who presented to the otorhinolaryngology clinic in month of July 2021with chief complaints of sudden onset painful swelling in the neck region accompanied with intermittent high-grade fever for five days. There was history of coronavirus infection six weeks prior to development of these symptoms. Patient and her entire family developed COVID-19 infection which was diagnosed by RT-PCR testing and managed by home isolation.

On examination of neck, an ovoid-shaped swelling of size 2x2 cm was present in midline slightly towards the left side extending from the thyroid notch superiorly to suprasternal notch and medial border of left clavicle inferiorly (Figure1a). The skin overlying the swelling was tense and slightly inflamed. Deglutition caused the swelling to move. The swelling was tender and firm with central fluctuations and fingers could be insinuated below the swelling. No sinus or fistula could be seen in her neck. Her chest and abdominal examination were normal. Thyroid function tests revealed a euthyroid status. IgG

level for anti-thyroid peroxidase was less than 0.8 IU/ml. Fine needle aspiration cytology findings were suggestive of acute suppurative thyroiditis. Ultrasonography of neck reported well-defined heterogenous hypoechoic lesion 2.3×1.9 cm having fluid content involving the entire left lobe and part of the isthmus of the thyroid gland (Figure 1b). Fibreoptic laryngoscopy revealed no internal opening or fistula in pyriform sinus.

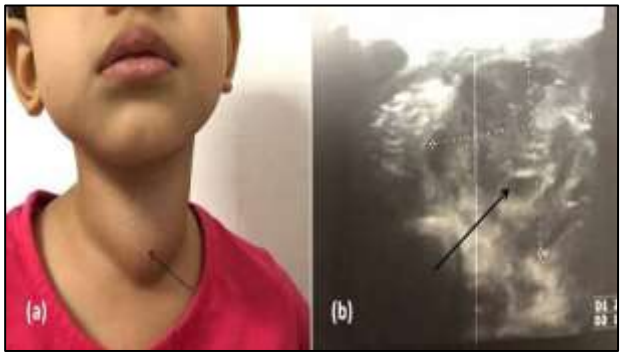

Figure 1: (a) The clinical photograph of child depicting midline neck swelling in the thyroid region (black arrow). (b) Ultrasonography of neck showing a well defined heterogenous hypoechoic lesion having fluid content, involving the entire left lobe and part of the isthmus of the thyroid gland and measuring 2.3×1.9 cm (bold black arrow).

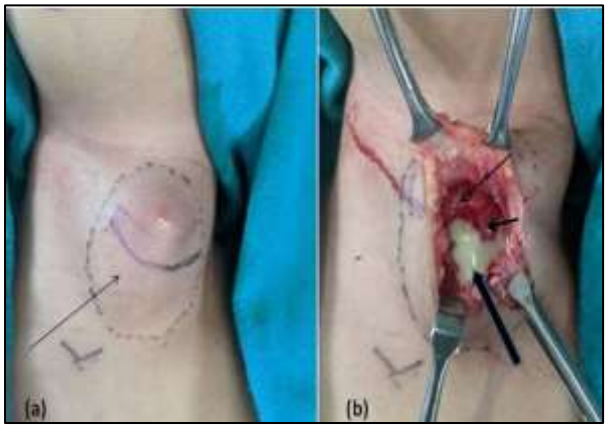

Figure 2: Peroperative incision and drainage pictures showing. (a) An ovoid swelling in the thyroid region of neck (black arrow) with inflamed overlying skin. (b) Surgical site after incising the swelling depicts strap muscles (long black arrow) , thyroid capsule (short black arrow) and frank pus (bold black arrow) coming out from the swelling.

Correlating the clinical evaluation and investigations, a diagnosis of post COVID-19 thyroid abscess was established. Patient underwent incision and drainage under general anesthesia and 6 cc of thick pus was drained from the thyroid gland and sent for microbiological analysis (Figure 2). No sinus or fistulous tract was found leading from abscess cavity towards pharynx. In pus culture and sensitivity no growth was observed. After 5 days of treatment, once patient showed no evidence of fresh pus formation, and development of healthy granulation, secondary suturing of the midline neck wound was done. On discharge regular weekly follow-up was advised. Patient is disease free now; the neck wound has healed well and is maintaining a regular follow-up.

DISCUSSION

Thyroid abscess is a rare clinical condition with incidence ranging from 0.7% to 1% of all thyroid disorders and its development in children is oddity.[3] The reason for this low incidence is because thyroid gland is well known to resist infections due to its rich blood supply and proper lymphatic drainage, high glandular content of iodine which can be bactericidal, separation of the gland from other structures of neck by facial planes and generation of hydrogen peroxide inside the gland. Occurrence of thyroid abscess in children is due to presence of congenital aberrations like persistence of pyriform sinus fistula or third and fourth arch anomalies. However no such defect was found in our patient. In our patient the only relevant point was a history of COVID-19 infection 6 weeks prior to development of thyroid abscess.

There have been several case reports and case series describing thyrotoxicosis, subacute thyroiditis, and autoimmune thyroiditis as a complication of COVID-19 infection in adults. Of these Ruggeri et al in their study distinctively emphasize the fact that thyroid dysfunction or damage can occur both during and after COVID-19 infection. They mentioned that enhanced immune responses and cytokine pathways involved in SARS-CoV2 infections resemble, at least in part, the immune activation that occurs in immune-mediated thyroid diseases. Apart from this SARS-CoV-2 uses ACE 2 (angiotensin converting enzyme 2) as a receptor to infect the host cells and ACE 2 is highly expressed by follicular thyroid cells. Hence, they state that thyroid inflammation/ damage may also be the consequence of a direct action of the SARS-CoV-2 virus on thyroid cells through ACE2 receptor.[4]

While children and adults share some risk factors for development of complications in SARS-CoV-2 infection, however the response in the paediatric population is distinct from adults 2. In view of limited amount of data in children it may be concluded that there is significant differences in response to SARS-CoV-2 infection in the paediatric population.[5] Although in most of the infected children the disease is mild or is characterized by a subclinical course but in some cases a severe late clinical picture in the form of a multisystem syndrome and other complications may develop termed as late COVID syndrome. In study conducted by Zhvania et al on 60 children with post-COVID complications and late COVID syndrome, more than half (53.3%) the cases were under 5 years of age that developed complications 1.5-2 months after COVID-19 infection. In their study most of

the children (85%) were healthy before the disease.[6] In our case also the child was 3 years old, remained asymptomatic during COVID infection but developed thyroid abscess 6 weeks following the disease. Based on this we conclude that development of thyroid abscess in child with otherwise asymptomatic course of COVID infection was rather a late COVID complication.

CONCLUSION

Although the disease course of COVID-19 infection is different in children as compared to adults but hypersensitive immune response may also affect the thyroid gland in children. Thyroid abscess although a rarity can be considered as one of complications labelled as late COVID syndrome in children.

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