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Case Report

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Ectopic Thymus in Newborn: A Case Report

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Abstract

Ectopic cervical thymus (ECT) Ectopic thymus is a rare, it usually presented as benign condition in which the thymic tissue is located at an unusual site along its migration.

In fewer cases, the patient may present with dyspnea, hoarseness, stridor, dysphagia and pain. The mass may present in cystic or solid forms.

We aimed to present in our case report the case of an infant with asymptomatic ECT in the submandibular region with all investigations and imaging that have been done to rule out serious conditions.

Keywords: Ectopic cervical thymus; Newborn; Dyspnea; Hoarseness; Dysphagia; Pain

Introduction

Solid neck masses are fairly common in the paediatric age group. Differential diagnosis includes fibromatosis colli, cervical lymphadenopathy, dermoid, epidermoid, hemangioma, neuroblastoma, ectopic thyroid and other metastatic lesions. Ectopic cervical thymus is an uncommon cause of a neck mass in an infant.

The thymus is a lymphoid organ, located in the superior anterior mediastinum, and is responsible for the maturation and differentiation of T lymphocytes. In neonates and infants, it is larger, more active, and in a state of continuous growth until it reaches its maximum weight (30-40 g) by the age of two to three years. As children grow into adolescence, the thymus begins to involute until it becomes an atrophic gland, mostly replaced by fatty tissue [1].

Patients with ectopic thymus are usually asymptomatic; however, compressive symptoms may occur in some cases, presenting with feeding difficulties, breathing difficulties, or Horner's syndrome in rare cases [2,3].

Case Presentation

A 5-week-old baby boy was admitted through our clinic with neck swelling. The swelling was over the right side of the neck noticed since the age of 1 week. Based on the history, there is no alarming symptoms like difficulty in breathing or feeding, no fever. Patient is full term with uncomplicated neonatal history, Family history was negative for malignancy.

On physical examination, growth parameters were normal, vital signs were normal. Examination of the neck revealed a right neck swelling in the submandibular region, the lesion was 3x4 cm in size and mobile, not fixed to the surrounding tissue, not tender, not pulsatile, with no skin changes.

An Ultrasound of the neck was done as an outpatient prior to current

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admission, showing findings in the right submandibular region, an oval-shaped well-defined subcutaneous mainly hypoechoic mass measuring 3.7 × 2.4 × 3.8 cm with internal clear vascularity on color doppler. It is abutting the right parotid and right submandibular gland. No soft tissue edema. No collections. The left parotid, left submandibular gland and thyroid are unremarkable, no significantly enlarged lymph nodes noted (Figure 1). Impression given as Subcutaneous right submandibular lesion with internal vascularity likely neoplastic for further imaging and tissue diagnosis.

Further imaging was carried out, MRI Neck Soft Tissue and Brain was performed illustrating a Large mildly enhancing soft tissue mass lesion seen inferomedial to the right parotid gland, abutting and superiorly displacing the right submandibular gland, extending obliquely inferomedially to the right lower neck, abutting the right thyroid lobe. It is displacing the right internal jugular vein laterally and posteriorly and partially encasing it. It is also noted slightly displacing the right common carotid artery medially and posteriorly (Figure 2). The mass is also noted to be abutting and laterally displacing the right sternocleidomastoid muscle with no evidence of invasion. No inter connection with the neural foramina. It is measuring about 4.6 × 2.5 × 2.4 cm in CC X AP X TR.

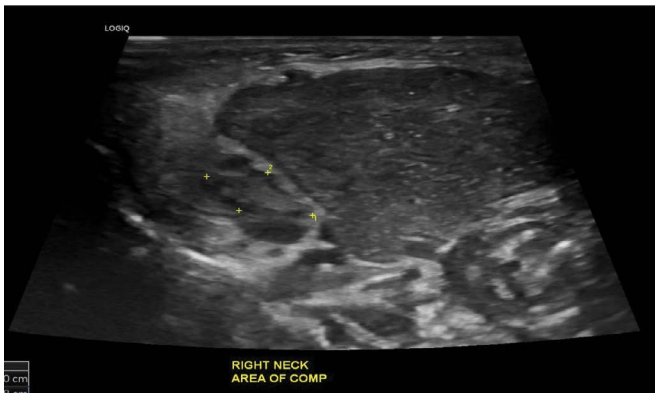

Figure 1: Ultrasound of the neck, showing subcutaneous hypoechoic mass.

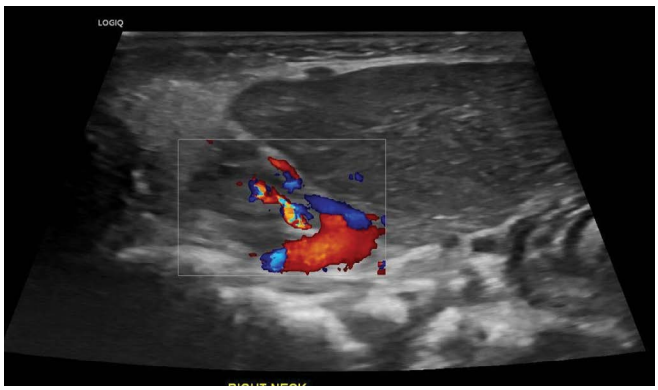

Figure 2: Doppler Ultrasound visualized signal voids vascular structures.

No significantly enlarged lymph nodes seen in the neck bilaterally. Incomplete myelination is noted, that corresponds to the patient's age.

No intracranial mass lesion, mass effect or midline shift. No recent or remote intra or extra axial hemorrhage. No acute hydrocephalus. No diffusion restriction. No acute well-established infarction. The visualized signal voids vascular structures are grossly unremarkable (Figure 3).

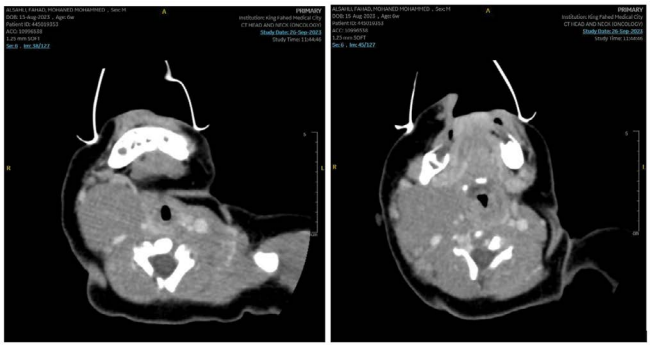

Figure 3: CT neck showing The lesion is displacing the right jugular vein and carotid artery medially and posteriorly.

Impression given as Large right sided neck mass noted as described above likely to represent neuroblastoma, however, other soft tissue neoplasms cannot be excluded, for histopathology.

Patient then was referred to king Fahad medical city (KFMC) as a case of query neuroblastoma for further investigation and assessment by hematology oncology team. There, MRI images were uploaded and assessed by another radiologist, impression of right neck mass with aggressive features and diffusion restriction with adjacent enlarged lymph node qualified for lymphadenopathy suggestive for neoplastic process most likely rhabdomyosarcoma.

MRI of the neck in KFMC was performed, with findings of a large right anterior neck soft tissue mass which is seen extending from the right angle of the mandible reaching the level of T1 vertebral body inferiorly. The lesion is isointense to low signal intensity in T1 and T2 with restricted diffusion. No abnormal enhancement within the lesion was appreciated. The lesion measures about 2.6 × 3.8 × 2.6 cm in the longest anteroposterior, transverse and craniocaudal dimensions.

The lesion is displacing the right jugular vein and carotid artery medially and posteriorly with no signs of thrombosis or occlusion. The lesion extends up to the inferior medial aspect of the right parotid gland and its inseparable from the right mandibular angle; however, no bony involvement.

Scattered bilateral cervical lymph nodes, most of them are sub-centimetric except that one superior to the lesion located in the right level 2A measuring 1.3 × 1.3 cm. The

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aerodigestive tract is patent. The major neck vessels are patent. The major salivary glands and thyroid gland are grossly unremarkable (Figure 4). Impression of Right anterior neck large mass with restricted diffusion most likely representing a neoplastic process like sarcoma for clinical assessment with histopathological result.

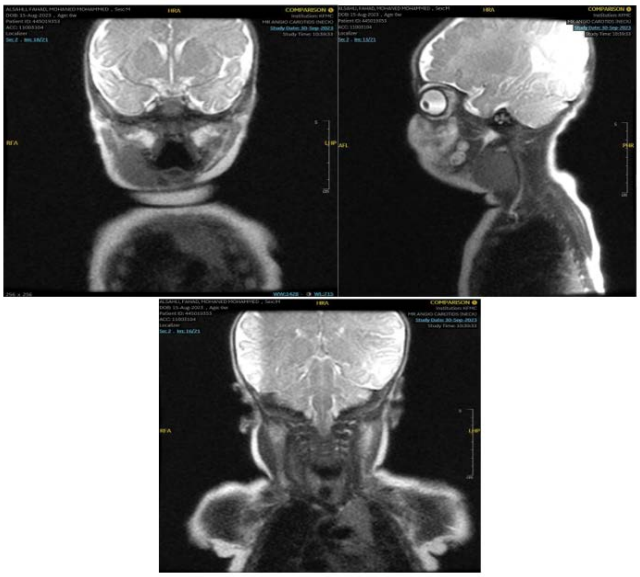

Figure 4: MIBG was performed with findings of right neck mass is non-MIBG avid.

MIBG was performed with findings of right neck mass is non-MIBG avid, Computed Tomography CAP was performed as well and was unremarkable.

Urine analysis of Homovanillic acid, Homovanillic acid/creatinine ration, Vanillylmandelic acid and Vanillylmandelic acid/creatinine ration all were unremarkable.

Biopsy of the mass was taken and send to pathology, given final diagnosis of Ectopic cervical Thymus, negative for malignancy (Figure 5).

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Date of birth	Gender
15.08.2023	male
Order	Customer-Code
MXP337T	K0608919 (000000000)
Date received	Reportdate
29.09.2023 11:36	04.10.2023 17:10
Primary Materials	
Urine, frozen	
Date of sampling	Labor code
26.09.2023 10:00	

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analyzed specimen	Result	Unit	Ref.-Range
Urine (u)			
Urinary analysis	**Result**	**Unit**	**Ref.-Range**
Creatinine (u)(**)	↓ 0,11	g/l	>= 0,20
Homovanillic acid (u)(**)	2,0	mg/l	
Homovanillic acid/creatinine ratio(**)	18,3	mg/gCrea	<= 32,6
	Please note the new reference range.		
Vanillylmandelic acid (u)(**)	1,2	mg/l	
Vanillic mandelic acid/creatinine ratio(**)	10,7	mg/gCrea	< 18,8
	Please note the new reference range.		

Figure 5: VMA urine bioscientia.

Discussion

The thymus gland is typically found in the upper front part of the chest, but in rare cases, it can be located in other areas along the thymopharyngeal canal. This abnormal positioning can result in breathing and feeding difficulties. local study was done in 2022 described a case of a 10-month-old male infant with an ectopic cervical thymus, where the thymus was located in his neck and caused swelling for nine months. Through investigations, they identified four potential diagnoses, and it was necessary to surgically remove the thymus and examine it under a microscope for confirmation. It is crucial to consider the possibility of an ectopic cervical thymus when evaluating neck masses in children to avoid unnecessary procedures and prevent complications [4].

Ectopic cervical thymus (ECT) is an uncommon occurrence where a solid mass forms in the neck of children. The location of this mass follows the path of the thymus gland's descent through the thymopharyngeal duct. By evaluating the sonographic echo pattern and magnetic resonance (MR) signal intensity, which are similar to those of the thymus in its usual location in the front of the chest, we can confidently diagnose ECT. A study was conducted in India in 2018 they presented a unique instance of ECT in a 2-month-old child, where the mass was located in the upper right side of the neck [5].

Ectopic cervical thymus (ECT) is a rare condition seen in children, typically with no noticeable symptoms. However, in some cases, patients may experience difficulties such as shortness of breath, hoarseness, stridor, difficulty swallowing, and pain. The mass can appear as either cystic or solid, with solid forms being less common, accounting for only 10% of ECT cases, and usually associated with symptoms. Ina case report was conducted in Turkey 2021 they presented an infant with ECT located in the submandibular region, which caused breathing difficulties. ECTs in the submandibular region are often solid and larger in size, leading to compressive symptoms. They covered the important aspects of diagnosing ECT, its treatment, and discuss the findings in light of existing literature. Furthermore, they highlight the significance of considering pediatric ECT as a possible diagnosis when evaluating neck masses in children and the importance of surgical removal to prevent serious complications [6].

Another case report was conducted in Italy 2020 This case report describes a rare case of ectopic cervical thymus (ECT) in a one-month-old infant. The infant presented with a swelling on the right side of the neck, and further examination revealed a soft, painless mass measuring 4×3 cm in the right submandibular region. Various tests, including laboratory workup, ultrasonography, and magnetic resonance imaging, were performed to confirm the diagnosis of ectopic thymic tissue. The mass was causing moderate compression of nearby structures. Initially, the patient was monitored, but

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as the mass slightly increased in size, surgical removal was performed when the infant was three months old. The surgery was successful, and the patient had a smooth recovery. The final histopathological examination confirmed the diagnosis of ectopic thymus. This case highlights the importance of considering ECT as a possible cause of neck masses in children and the successful management through surgical intervention [7].

In our case report, A 5-week-old baby boy was admitted to a clinic with a swelling on the right side of his neck that had been present since he was 1 week old. The baby did not exhibit any alarming symptoms such as difficulty breathing or feeding, and there was no fever. The physical examination revealed a mobile, painless, and non-tender swelling in the submandibular region of the neck. An ultrasound of the neck showed a well-defined mass with internal vascularity, suggesting a neoplastic (tumor) lesion. Further imaging with an MRI confirmed the presence of a large soft tissue mass in the right neck, which was displacing nearby structures but not invading them. The initial impression was that the mass might be a neuroblastoma, but after assessment by another radiologist at a different medical center, it was suggested that the mass was more likely a rhabdomyosarcoma, another type of soft tissue cancer. The MRI also revealed enlarged lymph nodes in the neck. The patient was referred to a hematology oncology team for further evaluation and a histopathological examination to determine the exact nature of the mass.

Conclusion

This case highlights the importance of considering ectopic cervical thymus as a differential diagnosis for neck masses in infants. Although typically benign, further investigations are necessary to rule out other serious conditions and determine the appropriate management approach.

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