A hard left supraclavicular mass in a young boy—is it cancer?

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Ramasamy K, Saniasiaya J, Gani NA. A hard left supraclavicular mass in a young boy—is it cancer?. *Malays Fam Physician.* 2020;15(2);53–55.

Keywords:
cervical rib; neck mass; supraclavicular; thoracic outlet obstruction

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Case Summary

A 12-year-old boy was referred to our ENT clinic with an incidentally discovered left supraclavicular mass that was suspected to be malignant. He was asymptomatic and had no prior illnesses. Neck examination found a fixed, hard, non-pulsatile, and non-tender mass measuring 2 cm in diameter in the left supraclavicular fossa. Rest of the ENT assessment, chest and upper limb neurovascular examinations were unremarkable. The patient's full blood count was within the normal range. A plain chest radiograph was taken as part of the work-up (**Figure 1**).

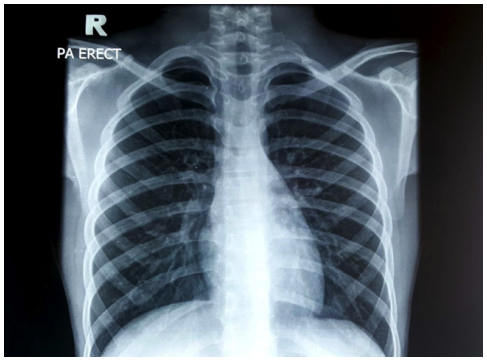

Figure 1. Plain chest radiograph

Questions

1. What abnormality is seen in the radiograph?
2. What differential diagnoses arise from a hard supraclavicular mass in a young boy?
3. What complications can potentially arise from the above condition?
4. List the management options for the above condition.

Answers

1. Description of the chest radiograph:

   There are bilateral cervical ribs arising from the seventh cervical vertebra. The cervical ribs are asymmetric; the left one is more prominent. There is no obvious fusion of the cervical rib with the first rib.

2. Differential diagnoses for a hard supraclavicular mass in a young boy:
   a) Reactive lymphadenopathy
   b) Lymphoma/leukaemia
   c) Metastatic lymphadenopathy
   d) Rhabdomyosarcoma
   e) Neuroblastoma
   f) Cervical skeletal anomalies (i.e., cervical rib, transverse mega-apophysis)

   A hard mass in the supraclavicular fossa must always be thoroughly investigated to exclude any sinister pathology, particularly malignant metastasis of the head and neck and thoracic neoplasms. Malignancies common in paediatric patients, such as lymphoma and leukaemia, should be ruled out as well. Reactive lymphadenopathy is the most common aetiology, and it is imperative to rule out serious endemic infections, such as tuberculosis. Nevertheless, the presence of a bony hard mass in an asymptomatic child without any risk factors should raise suspicions of a cervical skeletal anomaly, such as a cervical rib. There is a well-described clinical test called the "springing test" that can reliably differentiate between a cervical rib and a supraclavicular lymph node.[1] To perform this test, the clinician applies pressure to the point corresponding to the surface marking of the cervical rib shaft in a springing fashion and assesses whether there is any transmission of the movement to the swelling—while the tip of a cervical rib would move to and fro, a lymph node would remain stationary. A simple radiograph or ultrasound depicting calcified mass can confirm the diagnosis of cervical rib and avoid unnecessary invasive diagnostic procedures, such as fine needle aspiration biopsies or even open biopsies.[2] Notwithstanding the diagnosis of cervical rib, an essential practice point is to always perform a complete examination with baseline laboratory investigations to avoid missing serious pathologies, as mentioned above.

3. Thoracic outlet obstruction (vascular and/or neurogenic)

   Cervical rib is a congenital anomaly characterised

by the emergence of an accessory rib usually from the seventh cervical vertebra, though there have been some cases of cervical rib emerging from the fourth, fifth, and sixth cervical vertebrae. This anomaly stems from a mutation of the *Hox* gene. It is a rare occurrence with a rate below 1%, and it is often asymptomatic.[3] However, in about 10% of the cases, there is compression on the subclavian vessels and/or the brachial plexus from the cervical rib or the fibrous band that connects the cervical rib to the first rib. In these cases, patients present with neurogenic and vascular symptoms that suggest thoracic outlet syndrome. The neurogenic symptoms include radiating pain to the upper limb with paraesthesia, weakness, and muscle wasting in the affected limb and hand. The vascular symptoms include coldness, pallor, cyanosis, and swelling of the limb.[4] In rare cases, cerebral embolus has been reported due to retrograde flow from subclavian artery compression, which can lead to stroke.[5] There are few commonly used provocative manoeuvres that can help to identify thoracic outlet obstruction, such as Adson's test and the elevated arm stress test (EAST). A positive Adson's test is characterised by diminution of the radial pulse when the neck is fully extended and the head is tilted towards the symptomatic side while the patient is holding in a deep breath. EAST is performed by abducting the arms to 90 degrees with the elbows flexed in the "hands-up" position. The patient is then asked to repeatedly open and close their hands for three minutes; the test is positive when symptoms are reproduced or the patient is unable to do the hand movements for the full three minutes. The use of both of these tests reported diagnostic specificity of about 82%, higher than either of them used independently. Nevertheless, in cases of suspected thoracic outlet obstruction, a CT or MRI scan is warranted for diagnostic confirmation and surgery planning.[6]

4. Management options:

   a) Reassurance

      - Asymptomatic patients do not require treatment. They should be reassured and advised to seek treatment later if symptoms of thoracic outlet obstruction emerge.

   b) Conservative approach

      - This is the first-line management option for symptomatic patients. It comprises analgesics (NSAIDs), muscle relaxants and physiotherapy.

   c) Surgery

      - If conservative approaches fail or there are acute neurovascular manifestations, surgical treatment is indicated.

      - The surgical procedure entails the excision of the cervical rib and, often, the first rib as well to alleviate the compression on neurovascular structures.[7]

Acknowledgements

No conflicts of interest reported by any of the authors.

How does this paper make a difference to general practice?

- Neck masses in children are encountered regularly in daily general practice and can often be perplexing.
- This paper highlights the importance of considering cervical rib as a differential diagnosis for children with a hard supraclavicular mass that are otherwise asymptomatic with no risk factors.
- When a cervical rib is suspected, a simple chest radiograph can be used to confirm the diagnosis.
- This paper details several bedside tests that can be used to assess potential complications stemming from a cervical rib.
- In addition to avoiding unnecessary invasive diagnostic procedures, a prompt diagnosis provides patients and parents with reassurance and prevents unnecessary anxiety over the possibility of malignancy.

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