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A Rare Case of Stridor with a Right Sided Aortic Arch in a Libyan Patient

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Authors' contributions

This work was carried out in collaboration between all authors. Author AAE designed the study, author EF did literature survey, authors AAA, HEK wrote the protocol and radiodiagnosis, author DSS wrote the first draft, statistical analyses, managed the analyses of the study. All authors read and approved the final manuscript.

Case Study

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ABSTRACT

A rare case of stridor with a right sided aortic arch is presented showing minimal or no change in circulatory pattern excepting for noisy breathing.

Keywords: Stridor; Libyan girl child; right side aortic arch.

1. CASE HISTORY

A 12 year female Libyan child presented with complaints of noisy breathing. CT scan of the nasopharynx and neck of the child is normal with normal fat planes, without any evidence of mass lesion, collection or enlarged lymph nodes. There is mucosal thickening of the left maxillary antrum. Anenoid enlargement is seen. Chest scan showed aortic arch to the right of trachea and the descending aorta is posterior to it, features consistent with right sided aortic arch causing narrowing of the trachea at the level of arch. The heart, pericardium,

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great blood vessels appear normal without mediastinal masses or lymph nodes enlargement or any evidence of pleural thickening or effusion. Bronchoscopy did also confirm right aortic arch compressing the right lower trachea.

The patient had right sided aortic arch causing minimal compression at the trachea just above the bifurcation of carina resulting 20% of the lumen narrowing with 80% of the trachea patent. (Fig. 1 Chest x-ray and Fig. 2 Diagram).

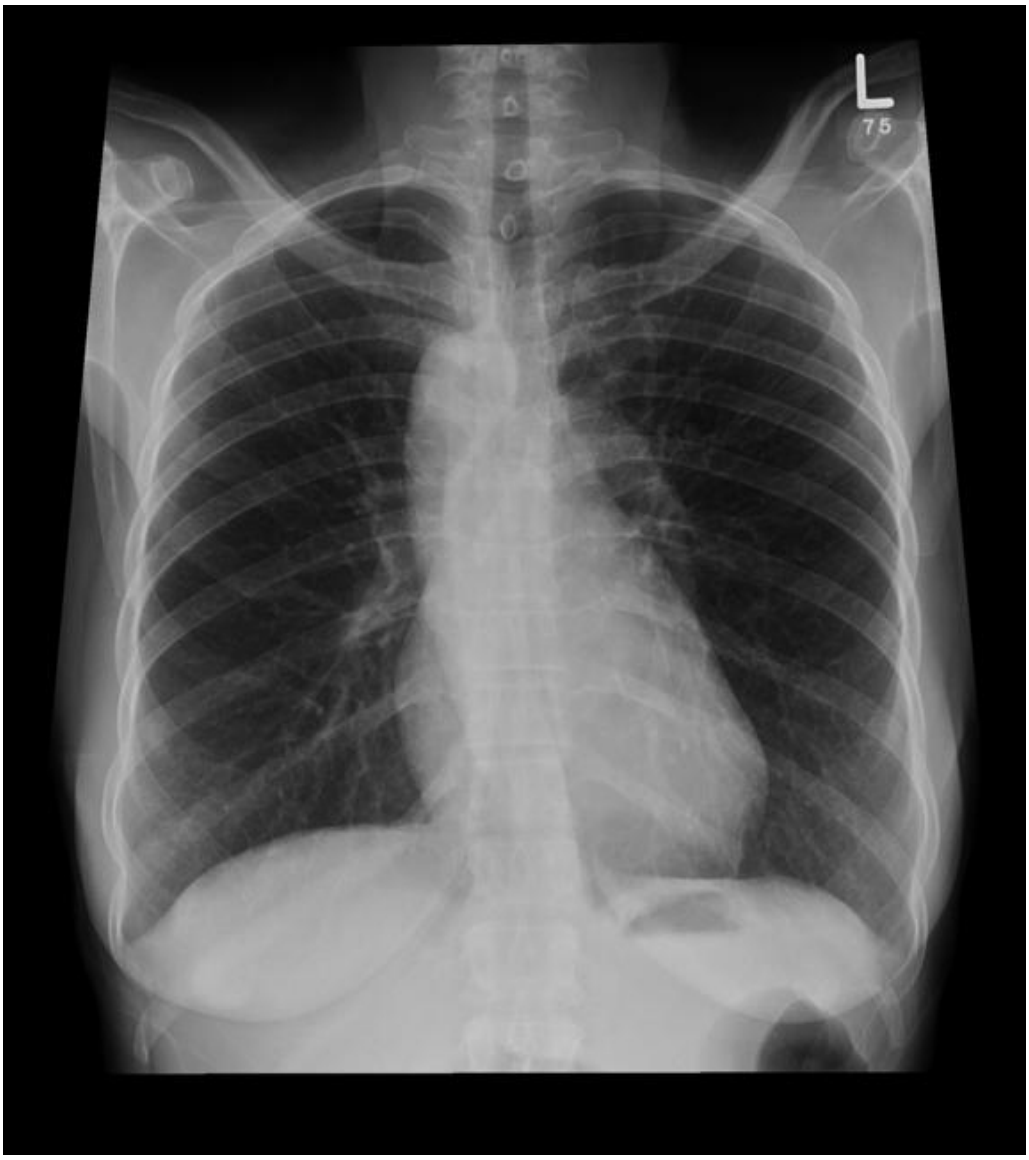

Fig. 1. Chest X-ray

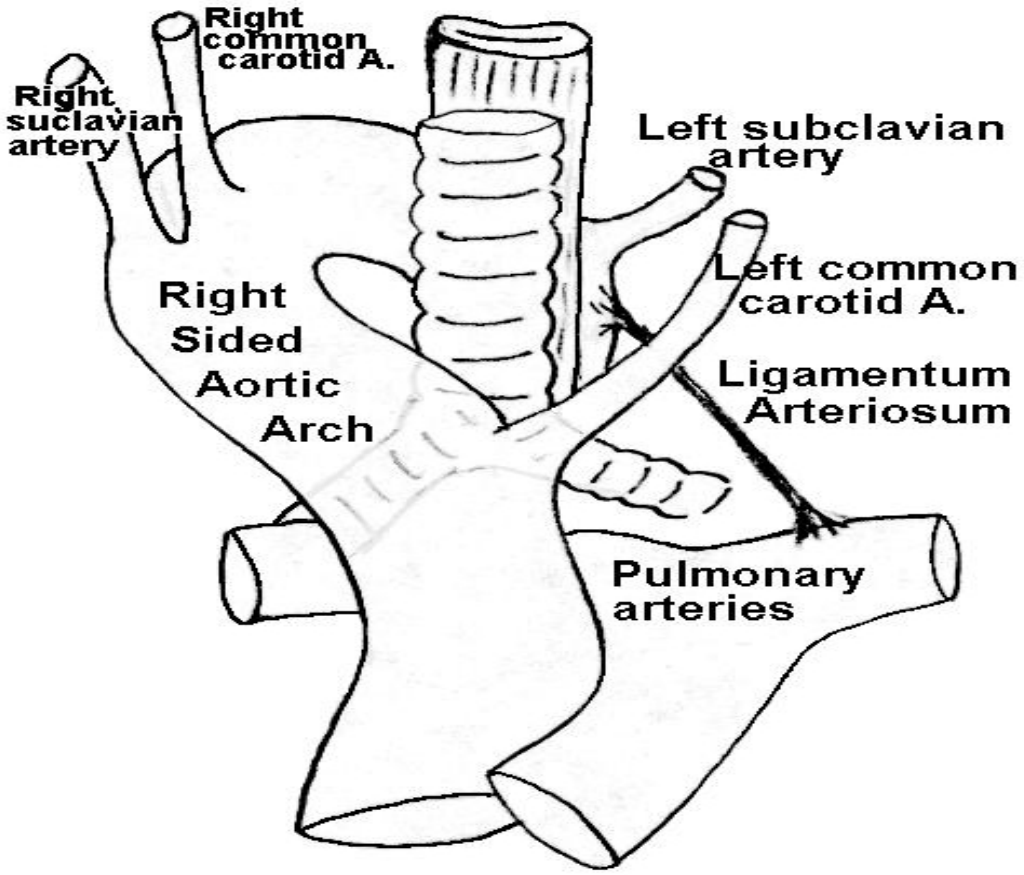

Fig .2. Right sided aortic arch

2. INTRODUCTION

Stridor is an auditory manifestation of a disordered respiratory function. The various causes of stridor are given in Table 1 and airflow changes in larynx and trachea are shown in the Fig. 3.

Table 1. Causes of stridor are anatomically classified

1. Supralaryngeal causes:
a. Nose - choanal atresia Obstruction due to infection / trauma / tubes b. Cranio facial anamolies: The various anamolies associated with respiratory difficulties are: Pierre Robin syndrome Treacher collin syndrome Apert's syndrome Cruzon's syndrome Mobieus syndrome c. Macroglossia : Beckwith Wiedemann syndrome Down's syndrome d. Tumors: Hemangioma Neuroblastoma e. Laryngomalacia : It is caused by an excessively elastic cartilagenous support to the airway seen in infants. These patients have inspiratory stridor which becomes better on prone position or when the child is calm. Stridor is worsened if the child is restless or excited.
2. Glottic causes:
Vocal cord palsy : Is one of the commonest cause of airway obstruction. In 80% of patients it is unilateral. Clinical features: Inspiratory stridor at birth

(Ref [1-7])

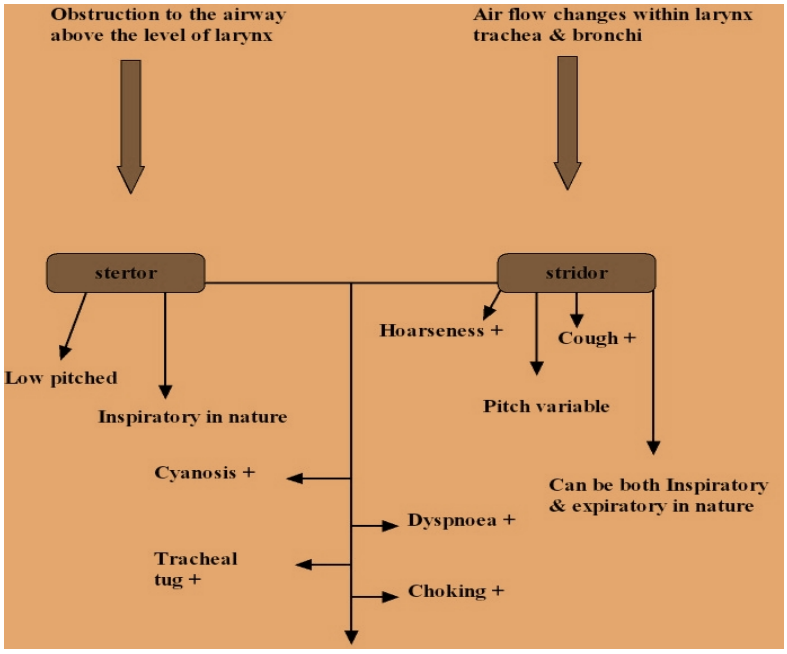

Fig. 3. Diagrammatic representation of air flow changes in Larynx and Trachea
Anatomical and developmental aspects of Aorta (Table 2)

The aorta and its main branches develop from six pairs of branchial arches which become transferred into the permanent major vessels (the aorta and its main branches) during the fifth to the seventh week of embryologic development. The carotid arteries are derived from the third pair of arches. The fourth branchial arch on the left forms the arch of the aorta whereas its opposite number on the right side atrophies and disappears. From the sixth pair of primitive arches, the pulmonary artery and the ductus arteriosus develop; the latter atrophies after birth to form the ligamentum arteriosum [8].

Normally, the aortic arch develops from the fourth branchial anlage on the left side and therefore assumes its usual position to the left of the vertebral column. However, the aortic arch occasionally arises from the fourth branchial arch on the right side, and the aorta then arches to the right [9] and may descend throughout its entire length to the right of the spinal column, [10] or, more usually, it crosses over from right to left in the lower thoracic region and emerges in its normal position beneath the diaphragm [11] In either event such an embryologic defect is a minor vascular abnormality because, in the majority of cases, it does not fundamentally alter the circulation of the blood and therefore is usually asymptomatic [12].

Presence of right-sided aortic arch is reported to be present in many other conditions like tetralogy of Fallot and other congenital anomalies [13-14].

Anomalies of the aortic arch were among the first congenital cardiovascular defects to be examined using clinical magnetic resonance imaging. While the clinical recognition of arch anomalies by plain chest radiograph and barium esophagography goes back decades, the precision of magnetic resonance imaging and computed tomography has virtually supplanted all other imaging techniques when surgical decision making requires an accurate anatomical diagnosis [1–7].

3. AORTIC ARCH

Normal Left aortic arch	**Right sided arch**
	Mirror image of the right aortic arch
Retroesophageal right subclavian artery	Right aortic arch with retroesophageal left subclavian artery(non ring)
Left arch, right descending artery	With diverticulum Kommerell
	With left descending aorta
	With with retroesophageal left ductula or ligamentum
	With left retroesophageal left innominate artery (no ring)

Table 2. Anomalies of arch of aorta

Double Aortic Arch	
Dominant Right arch	Equal size arches
Dominant Left arch	
Persistent 5th Arch	

4. CONCLUSION

An unusual case of stridor is presented in a Libyan girl child. It has been shown that right aortic arch is associated with some common variable immune deficiency syndrome. The present case with a right sided aortic arch is not associated with any immune deficiency syndrome or genetic disorder [15]. The present case had minimal or no change in circulatory pattern excepting for noisy breathing. During sleep the respiratory noises were prominent. Physical examination of the child showed that stridorous sounds were limited to inspiration. The patient was not given any medication excepting for a psychological reassurance. In an adolescent Libyan girl child the respiratory noises had profound psychological effect on the patient and it affected the wellbeing of the child [16]. The psychological reassurance given by the physician did relieve the anxiety of the parents and the girl child.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

The authors have obtained all necessary ethical approval from Institutional Ethical Review Committee, Faculty of Medicine, Benghazi University, Benghazi

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Manoukian JJ, Tan AK. Embryology of the larynx. In: Tewfik TL. Der Kaloustian VM, eds. Congenital Anomalies of the Ear, Nose, and Throat. New York, NY: Oxford University Press; 1997.
2. O'Rahilly R, Tucker JA. The early development of the larynx in staged human embryos. I. Embryos of the first five weeks (to stage 15). Ann Otol Rhinol Laryngol. 1973;82:1-27.
3. O'Rahilly R, Müller F. Chevalier Jackson lecture. Respiratory and alimentary relations in staged human embryos. New embryological data and congenital anomalies. Ann Otol Rhinol Laryngol. 1984;93:421-9.
4. Harjeet K, Sahni D, Batra YK, Rajeev S. Anatomical dimensions of trachea, main bronchi, subcarinal and bronchial angles in fetuses measured ex vivo. Paediatr Anaesth. Nov 2008;18:1029-34.
5. Harjeet K, Sahni D, Jit I. Development of the human trachea. J Anat Soc India. 2004;53:1-3.
6. Jit H, Jit I. Dimensions & shape of the trachea in the neonates, children & adults in northwest India. Indian J Med Res. 2000;112:27-33.
7. Skandalakis LJ, Skandalakis JE, Skandalakis PN. Neck anatomy. Surgical Anatomy and Technique: A Pocket Manual. 3rd ed. New York, NY: Springer-Verlag; 2009.
8. Barry A. Aortic arch derivatives in human adult. Anat. Rec. 1952;111:221–238
9. Woodburne RT. Case of right aortic arch and associated venous anomalies. Anat. Rec. 1951;111:617–627.

10. Abrams HL. Left ascending aorta with right arch and right descending aorta. Radiology. 1951;57:58–62.
11. Samet P, Stone DJ. Right-sided aortic arch. Am. Heart J. 1950;40:951–954.
12. Goldwyn A. Unusual anomaly of aortic arch. J. Pediat. 1951;38:442–446.
13. Neuhauser EBD. Tracheo-esophageal constriction produced by right aortic arch and left ligamentum arteriosum. Am. J. Roentgenol. 1949;62:493–499,1949.
14. Smithells RW. Vascular ring: cause of congenital stridor. Arch. Dis. Childhood 1953;28:204–208.
15. Yalcin AD, Aydemir N, Turgut H, Erbay H, Yalçın AN. Common variable immunodeficiency syndrome with right aortic arch: a case report. BMC Infectious Diseases. 2004;4(1):2-6. doi: 10.1186/1471-2334-4-2.
16. Timothy J. Lacy, Susan E. McManis Psychogenic stridor. General Hospital Psychiatry 1994;16:213-223.

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