

Dextrocardia with Situs Inversus in an 18-Year-Old Nigerian Female: The Computed Tomographic Findings and a Case Report

Sule MB ^{1*}, Gele IH ², Shirama YB ², Ribah MM ², Aliyu AZ ² and Abacha M ³

¹Radiology Department, Usmanu Danfodiyo University, Sokoto.

²Radiology Department, Usmanu Danfodiyo University Teaching Hospital, Sokoto.

³Department of Radiography, Usmanu Danfodiyo University, Sokoto.

***Corresponding Author:** Sule Muhammad Baba; Department of Radiology, Usmanu Danfodiyo University, Sokoto.

Received date: June 10, 2021; Accepted date: June 27, 2021; Published date: July 15, 2021

Citation: Sule MB, Gele IH, Shirama YB, Ribah MM, Aliyu AZ, et al. (2021). Dextrocardia with Situs Inversus in an 18-Year-Old Nigerian Female: The Computed Tomographic Findings and a Case Report. *J Thoracic Disease and Cardiothoracic Surgery*, 2(2); DOI:10.31579/2693-2156/025

Copyright: © 2021, Sule Muhammad Baba, This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Dextrocardia is a cardiac positional anomaly in which the heart is located in the right hemithorax with its base to apex axis directed to the right and caudad. The malposition is intrinsic to the heart and not caused by extracardiac abnormalities.

Dextrocardia is a rare condition and usually found incidentally and in association with other congenital abnormalities. It has an incidence of less than 1%.

This is an 18 year old Nigerian female who was referred for computed tomography (CT) of the chest on account of prolonged and recurrent cough with a suspicion of diffuse interstitial lung disease.

The chest and upper abdominal CT scan showed dextrocardia with a right placed heart, displaced spleen and stomach to the right hemi-abdomen and liver displaced to the left hemi-abdomen; confirming the diagnosis of dextrocardia with situs inversus.

We present this case of dextrocardia with abdominal situs inversus due to its rarity in literature.

Keywords: dextrocardia; situs inversus; adult, incidental; hemithorax; extracardiac abnormalities;

Introduction

Dextrocardia is a cardiac positional anomaly in which the heart is located in the right hemithorax with its base to apex axis directed to the right and caudad. The malposition is intrinsic to the heart and not caused by extracardiac abnormalities [1].

Displacement of the heart to the right by extracardiac causes like right lung hypoplasia, right pneumonectomy or diaphragmatic hernia is termed cardiac dextroposition and should be differentiated from dextrocardia [1-3].

Dextrocardia is a rare condition and usually found incidentally and in association with other congenital abnormalities. It has an incidence of less than 1% [4,5]. Dextrocardia has an incidence of about 1 in 12,019 pregnancies in the united states of America, the true prevalence in Nigeria is unknown [2,6].

Dextrocardia may be associated with variable anomalies; intracardiac and extracardiac anomalies [4,5,7]. The intracardiac anomalies such as

discordant atrioventricular connection, univentricular atrioventricular connection, ventricular septal defects and anomalies of the pulmonary artery [4].

Dextrocardia has been classified in to four types; dextrocardia with normal positioning of abdominal organs (situs solitus with dextrocardia), dextrocardia with a reverse in position of abdominal organs (situs inversus with dextrocardia), dextrocardia with undifferentiated cardiac chambers (situs ambiguous) and the fourth type is a normal heart shifted to the right side of the chest (dextroposition) [2,3].

Situs inversus is a rare entity and reported to occur in 1 in 8000-1 in 25,000 patients [8-10]. Situs inversus is usually detected incidentally following presentation of the individuals with usually unrelated signs and symptoms [8,9].

Situs inversus has been divided in to two major types which are situs inversus with dextrocardia (commonest form) and situs inversus with levocardia (rare form) [8,11].

Dextrocardia has no known cause, but maternal diabetes mellitus and maternal cocaine use have been implicated. Factors like Genetics are also suspected with increased incidence found among conjoined twins [8,12,13].

Kartagener in 1933, described the association of sinusitis, bronchiectasis and situs inversus which was referred to as Kartagener’s syndrome [2,14].

Case History

This is an 18 year old Nigerian female who was referred for computed tomography (CT) of the chest on account of prolonged and recurrent cough with a suspicion of diffuse interstitial lung disease.

The patient is unmarried and looking well feed but in some form of respiratory discomfort. She is conscious and alert, not pale, anicteric, acyanosed, not dehydrated, not in painful distress, no pedal edema.

The pulse rate was normal and about 72 beats/minute, normal blood pressure of 110/60mmHg, and respiratory cycle of 12cycles per minute.

The chest and upper abdominal CT scan showed dextrocardia with a right placed heart, displaced spleen and stomach to the right and liver displaced to the left; confirming the diagnosis of dextrocardia with situs inversus viscerum (figures 1 and 2).

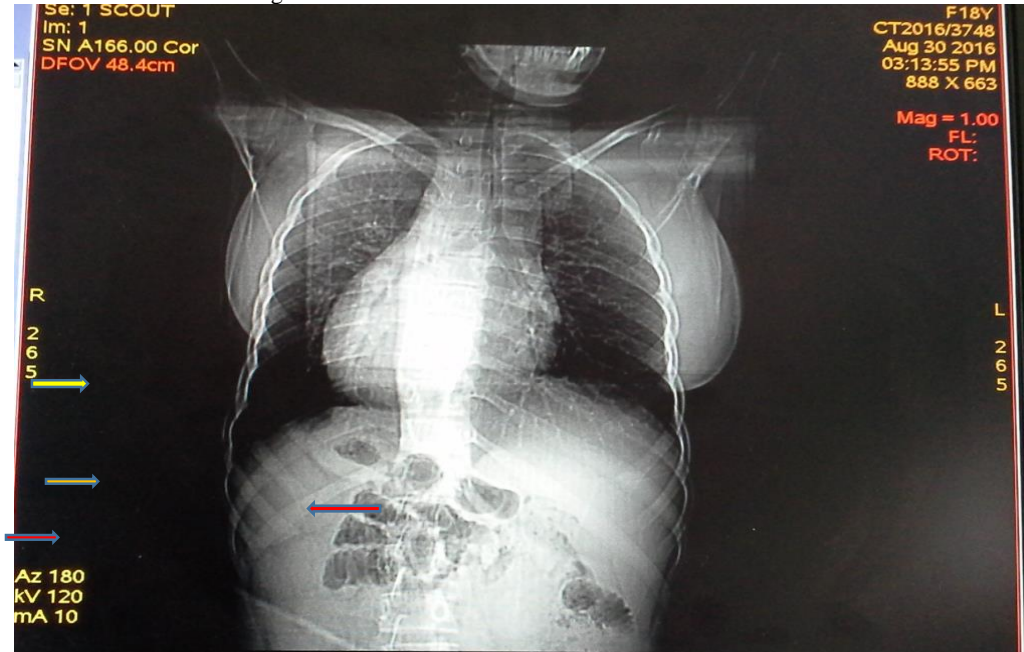


Figure 1: A scanogram or scout image of a chest computed tomographic scan showing a rotated apex of the heart to the right (right yellow arrow) with the liver shadow on the left (left red arrow) and the splenic (right red arrow) with the gastric fundal gas (right brown arrow) on the right.



Figure 2: Computed tomographic non oral and intravenous contrast enhanced axial image of the upper abdomen at the level of the liver; the liver is on the left hemi-abdomen (left red arrow) while the spleen (right red arrow) and stomach (right brown arrow) are noted on the right side of the patient. This is abdominal situs inversus totalis.

The chest scanogram or scout image showed differential lucencies with hyperinflation of the lungs more in the lower zones bilaterally. There is prominence of the airways; bronchi raising a suspicion of an interstitial lung disease with air trapping most likely bronchiectasis. See figure 1. Following the above chest and upper abdominal CT scan with clinical presentation and history of prolonged respiratory symptoms we had a high suspicion of Kartagener's syndrome.

Discussion

Dextrocardia is a rare condition with presence or absence of situs inversus. Situs inversus which is either associated with dextrocardia or levocardia is also a rare entity; this index case is that of dextrocardia with situs inversus which has a right placed heart with displaced abdominal organs. No any extracardiac cause of displacement of the heart to the right side is demonstrated in this index case.

The commonest presentation of situs inversus are usually extracardiac and often respiratory due to its usual association of sinusitis and interstitial lung disease which was described by Kartagener in 1933; the index case also had prolonged and recurrent respiratory symptoms/complaint which were basically the reason for imaging and clinical evaluation with subsequent diagnosis.

Basic imaging facilities like radiography, computed tomography, magnetic resonance imaging with ultrasonography are reported to play vital role in the diagnosis of dextrocardia with or without situs inversus, our case was diagnosed following a non-enhanced computed tomography of the chest and upper abdomen.

The cause of the dextrocardia was not established in this case, this is similar to that reported in the literatures. The patient denied history of maternal diabetes or use of hard drugs like cocaine. No family history of similar symptoms or cases was documented in this case.

Dextrocardia may be associated with intracardiac anomalies; we were not able to conduct an echocardiography and electrocardiography in this case as at the time of presentation.

Conclusion

Dextrocardia is a very rare entity and maybe associated with abdominal situs inversus. A report of such cases will help in having a record of incidence/prevalence of the entity and may also assist in determining possible causative agents/etiology in our environment.

References

1. Pierre DM, Muhamed S. (2007). Approach to Dextrocardia in Adults: Review. *Am J Roent.* 2007; 188:S39-S49.
2. Ibrahim A, Mustafa AO. (2014). Dextrocardia seen in the children in Aminu Kano Teaching Hospital: A report of 8 cases. *Nig J Cardiol* 2014; 11:49-53.
3. Myung KP. (2011). Chamber localization and cardiac malposition. In: *Pediatric Cardiology for Practitioners*. 5th ed. Philadelphia. MOSBY: Elsevier; 2011. P. 309.
4. Syed WY, Jean BD, Joseph S. (2008). Dextrocardia: an incidental finding. *Tex Heart Inst J.* 2008; 36:358-359.
5. Bernasconi A, Azancot A, Simpson JM, Jones A, Sharland GK. (2005). Fetal dextrocardia: diagnosis and outcome in two tertiary centres. *Heart* 2005; 91:1590-1594.
6. Bohun CM, Potts JE, Casey BM, Sandor GG. (2007). A population based study of cardiac malformations and outcomes associated with dextrocardia. *Am J Cardiol.* 2007; 100:305-309.
7. Garg N, Agarwal BL, Modi N, Radhakrishnan S, Sinha N. (2003). Dextrocardia: an analysis of cardiac structures in 125 patients. *Int J Cardiol.* 88:143-156.
8. Soneye MA, Idowu BM. (2018). Dextrocardia with situs inversus discovered incidentally on routine imaging. *J Clin Sci.* 2018; 15:168-170.
9. Tabri IF, Calabrese J, Zammar H, Abou-Kasem K, Akelian H, Gharbieh N et al. (2001). Case report: off-pump total myocardial revascularization for dextrocardia and situs inversus. *Heart Surg Forum* 2001; 4:251-253.
10. Splitt MP, Burn J, Goodship J. (1996). Defects in the determination of left-right asymmetry. *J Med Genet* 1996; 33:498-503.
11. Maldjian PD, Saric M. (2007). Approach to dextrocardia in adults: Review. *AJR Am J Roentgenol* 2007; 188:S39-S49.
12. Agirbasil M, Hamid R, Jennings HS 3rd, Tiller GE. (2000). Situs inversus with hypertrophic cardiomyopathy in identical twins. *Am J Med Genet.* 91:327-330.
13. Distefano G, Romeo MG, Grasso S, Mazzone D, Sciacca P, Mollica F et al. (1987). Dextrocardia with and without situs viscerum inversus in two sibs. *Am J Med Genet* 1987; 27:929-934.
14. Kartagener M. (1933). The pathogenesis of bronchiectasis. Bronchiectasis and situs inversus viscerum. *Beitr Klin Tuberk.* 1933; 83:489-501.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here: [Submit Manuscript](#)

DOI: [10.31579/2693-2156/025](https://doi.org/10.31579/2693-2156/025)

Ready to submit your research? Choose Auctores and benefit from:

- ❖ fast, convenient online submission
- ❖ rigorous peer review by experienced research in your field
- ❖ rapid publication on acceptance
- ❖ authors retain copyrights
- ❖ unique DOI for all articles
- ❖ immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more www.auctoresonline.org/journals/journal-of-thoracic-disease-and-cardiothoracic-surgery-