Case Report

Sudden Death Due to Myocardial Infarction Consequent Upon Situs InversusTotalis - A Case Report

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Abstract

Forensic pathologists rarely come across natural deaths when there are cases of sudden natural death. Sudden natural deaths are mostly due to the involvement of the cardiovascular system. Here, we report a case of a young male without any prior medical history, who was found unconscious in his bed by his friend and was declared brought dead to the hospital. At autopsy, the cause of death was attributed to myocardial infarction consequent upon situsinversustotalis. SitusInversustotalis is a rare congenital anomaly in which there occurs reversal placement of various thoracic and abdominal organs to their normal anatomical location.Since, SitusInversusTotalis has an increased risk of associated functional heart defect than the general population which can in turn lead to sudden death in these cases, this case report is being presented to stress on the need for early diagnosis and regular follow-up of such cases to prevent mortality.

Key words:Forensic pathology; SitusInversus; SitusInversustotalis; Dextrocardia; Sudden natural death.

Introduction:

Situs Inversus is a rare congenital anomaly in which there occurs reversal placement of various thoracic and abdominal organs to their normal anatomical location. In Situs Inversustotalis, which is a recessively inherited condition, there occurs mirror image of the anatomic location of all the viscera while in dextrocardia only the apex of the heart points to right and is present in the right hemithorax. Sometimes, when Situs Inversus is accompanied by sinusitis and bronchiectasis, it constitutes Kartagener Syndrome.[1]

The WHO defines sudden death as sudden or unexpected death when a person not known to have been suffering from any dangerous disease, injury or poisoning is found dead or dies within 24 hours after the onset of terminal illness.The incidence of Sudden Death is about 10% of all causes of death and of these, almost half are due to cardiovascular causes and 15-23% is due to respiratory involvement.[2]Before the age of 35 years, the congenital and hereditary cardiovascular diseases are the main causative factors for Sudden Death.[3]

Sudden death in a case of situs inversustotalis is mostly due to cardiac causes like coronary heart disease and functional defects, with very few cases reported in literature.

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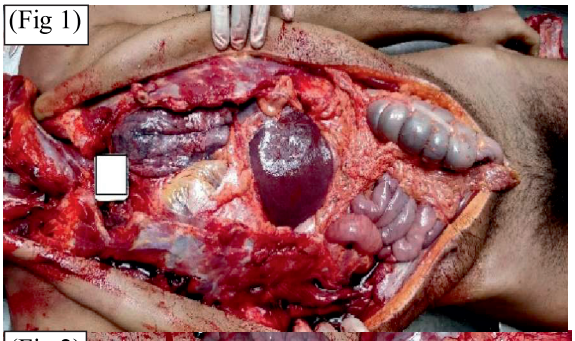
Case Report:

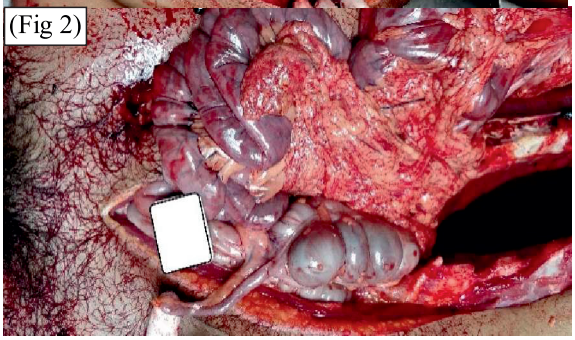
A 26 year-old-male was found unconscious in his bed by his friend. He was taken to the hospital where he was declared brought dead. Externally, the body measured 169 cm and was moderately built and nourished. Post-mortem staining was

present over the back of chest and abdomen and was fixed. Rigor mortis was appreciated all over the body. There were no injuries noted. Internal examination, on opening chest and abdomen- SITUS INVERSUS TOTALIS was noted (Fig 1 & 2). Both lungs were edematous and congested.Heart showed DEXTROCARDIA (Fig 3),Heart weighed 488 g, Apex pointed to the right and showed a grey white area over an area of 2 cm x 1.5cm in the posterior surface (Fig 4). All the valves and chambers were identified and unremarkable. Aorta opened into the left ventricle. Histopathology from myocardial tissue revealed loss of waviness of myocardial fibres along with myocytolysis and absence of cross striations. Few sections studied from apex showed enlarged box like nuclei with loss of cross striations in the myocardial fibres.

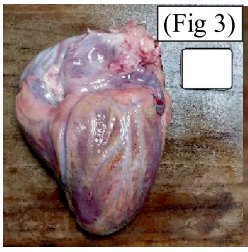
(Fig 1)



(Fig 2)



(Fig 3)



(Fig 4)

Liver waspresent on the left side,weighing 1200g, cut section was unremarkable. Spleen was present on the right side.

On perusal of the autopsy findings and the histopathology report, cause of death was opined to be due to cardiac arrest as a result of myocardial infarction consequent upon situs inversustotalis.

Discussion:

The exact incidence of Situs Inversus is not known because these persons remain asymptomatic; however, an incidence of 6-8 per 1000 live births is reported for congenital anomalies of heart.[4]The incidence of Kartagener Syndrome is about 1:20,000. 3-5% of people with Situs Inversus have associated functional heart defect, which is higher than rate of heart defect in general population. Alt
Situs Inversus alone does not increa
risk of cardiovascular disease, cases with associated cardiac anomaly may lead to sudden death.

Situs inversus can be classified further into situs inversus with levocardia or situs inversus with dextrocardia. The terms Levocardia and Dextrocardia indicate the direction of the cardiac apex at birth but not the orientation of the cardiac chambers. In Levocardia, the base to apex axis is towards the left and reverses in case of Dextrocardia. Isolated dextrocardia is Situs solitus with dextrocardia. The cardiac apex points to the right, but the viscera are otherwise in their usual positions. Situs inversus with dextrocardia is situs inversustotalis because of the cardiac position, as well as the atrial chambers and reversed abdominal viscera.[5,6]

Dextrocardia is a rare congenital malformation characterized by displacement of the heart to the right hemithorax with its base-apex axis oriented to the bottom right. It is caused by factors intrinsic to the heart and there is no relationship with extracardiac abnormalities. It has a variable intracardiac anatomy and is usually associated with

other congenital abnormalities, such as defects in the interatrial and interventricular septa, abnormalities of the pulmonary artery and univentricular heart. [7]

Situs inversustotalis does not affect the normal life of the patient, and the diagnosis is usually coincidental. However, acute traumatic and forensic problems, acute appendicitis, and other disorders requiring acute intervention can lead to surprises for the surgeon and patient if the condition is not recognized preoperatively.[8]The condition of situs inversustotalis is associated with diagnostic and therapeutic issues. With regard to its surgical implications, the surgeons are likely to face difficulties due to reverse anatomy during surgeries performed on patients with situs inversus.[9] It is believed that for patients with total situs inversus and cholelithiasis, a left-handed surgeon can carry out the procedure of laparoscopic cholecystectomy more comfortably than a right-handed surgeon.[10]Failure to diagnose these cases by Physicians, Anaesthetists and Radiologists may lead to charge of negligence against them.[11]

If any case of Situs Inversus is encountered at autopsy, the family of deceased should be counselled and first-degree relatives may be advised by autopsy surgeon to undergo a possible screening, as they are prone to have various cardiac abnormalities. Situs Inversus with cardiac abnormality or respiratory complications decreases the life span and thus increases the risk for sudden death.[12]

Conclusion:

In the present case, the deceased was brought dead to our hospital, he had not been diagnosed to have situs inversustotalis even though he had visited a few doctors for treatment of upper respiratory tract infections. Early diagnosis and regular follow-up would help in preventing mortality in such cases.

Conflict of Interest: None

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