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A Case Report on Tetralogy of Fallot

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Abstract:

Tetralogy of Fallot (ToF) is a cyanotic inborn heart abnormality that is diagnosed by four main anomalies which includes pulmonary stenosis, ventricular septal defect, overriding of aorta and right ventricular hypertrophy. ToF is frequently observed in newborns and should be screened for ToF, if there are any classical signs and symptoms are observed. In the present case study, there is a 19 years old female patient hospitalized with a chief complaints of chest pain and was been diagnosed with ToF finally based on the investigations such as ECG, Echocardiogram and some other clinical significances. The clinical management was done by necessary pharmacotherapy which improved the patient condition better. The patients had a same clinical signs and symptoms in her childhood and was not been screened for ToF, if she would have been diagnosed at early age and necessary pharmacotherapy/surgical intervention were made, the patient would not have suffered at early teenage. Hence it is an alarm for all the physicians and other healthcare professionals to screen the patients for ToF in the early age group and induction of necessary pharmacotherapy/surgical intervention in order to minimize morbidity and mortality rate in early childhood/teenage.

Keywords: Tetralogy of Fallot (ToF); early diagnosis; Pharmacotherapy/Surgical Intervention; Reduced Mortality/Morbidity.

Introduction:

Tetralogy of Fallot (ToF) is a frequent imperfection in patients which obstructs the blood flow from the heart to the lungs causing decreased oxygen levels in the blood concentration [(1)]. ToF incidence was been reported as 0.19 to 0.26/1,000 live births. In the United States, the occurrence of ToF is around 3.9 per 10,000 live births. Hardly any patients were reported to have survived above the age of 60 years. Only 10% of people may survive to their 30s and 3% to reach their 40s or older. There are four main anatomical abnormality findings that help in the earlier diagnosis of ToF, they are pulmonary stenosis, overriding of aorta, right ventricular hypertrophy and ventricular septal defect (Fig. 1.)[(2)].

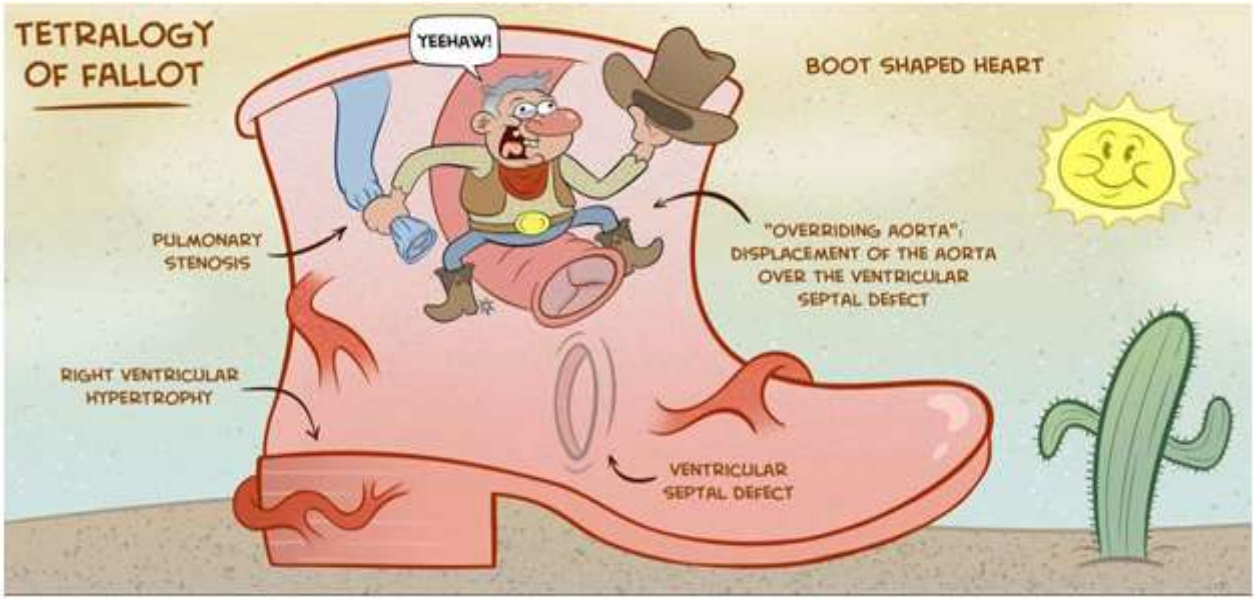

Fig. 1. Four Anatomical abnormalities in Tetralogy of Fallot

The clinical features of ToF may include cyanosis (bluish coloration of the skin due to decreased oxygen levels of the blood), shortness of breath due to decreased oxygen levels in the blood, clubbing of fingers and toes, a heart murmur due to ventricular septal defect, extended crying or tet spells. Investigations that are helpful in the diagnosis of the disease include Electrocardiogram, Echocardiogram and chest X- ray. Electrocardiogram of ToF patients shows the right axis deviation due to right ventricular hypertrophy. Echocardiogram of the patient indicates the extent of overriding of aorta, right ventricular hypertrophy, ventricular septal defect and infundibular or pulmonary stenosis. Chest x-ray shows normal heart size which is boot shaped due to right ventricular hypertrophy with normal position of lungs. The initial management of signs and symptoms are done with necessary drugs and once it is the confirmed diagnosis of TOF, the patient should undergo remedial surgical mend to improve the quality and extent of life expectancy [(3)].

Case Presentation:

A 19 years old female patient has been admitted to the hospital with the chief complaints of chest pain since one day. Patient was apparently alright one day back then at night she started to feel the retrosternal chest pain which is non pricky type radiating to the back, not radiating to the arm, not associated with palpitations or sweating which is insidious in onset and gradual in progression. There were no complaints of cough, cold, abdominal pain, breathlessness or headache. Past medical history of the patient reveals that she had a similar complaints during childhood for which she was been taken to the local doctor but they had not been diagnosed as ToF.

The current general examinations were, pulse rate 60 BPM, blood pressure 110/70 mmHg, respiration rate is 16 cycles per minute, body temperature 37.5ºC, pallor: absent, icterus: absent, cyanosis: present, clubbing: grade 4 clubbing of both upper and lower limbs, edema: absent and no dilation of neck veins. On Systemic examination of the patient, the eyes shows hyperemic conjunctiva, pupils, the Respiratory system: Chest type: unsymmetrical, shoulder drooping on left side and trachea in the central position, the Cardiovascular system: S1 S2 heard, apex influx: apex beat is in the left 5^{th} intercostal space 1.25 inch medial to midclavicular line, no dilated veins, continuous type systolic murmurs heard over pulmonary and tricuspid area, Central Nervous system and PA are normal. Investigations show that CBC, urine routine, RBS and serum creatinine are normal. Other investigations include ECG and Echocardiography. ECG shows the right axis deviation which indicates right ventricular hypertrophy. Echocardiography concludes cyanotic CHD- situs solitus d-loop ventricle, tetralogy of fallot, large subaorttic VSD with bidirectional shunt, RA/RV dilated, RVH+, 50% overriding of

aorta, IAS intact, severe valvular & infundibular pulmonary stenosis, hypoplastic & confluent PA's, good biventricular function and left aortic arch normal.

The diagnosis of ToF was made based up on investigations such as ECG which indicates right ventricular hypertrophy. Echocardiography which indicates RVH+, 50% overriding of aorta, infundibular pulmonary stenosis and subaortic ventricular septal defect. The physical signs such as cyanosis and clubbing were also present in ToF. The patient was been stabilized and treated with oxygen inhalation to decrease peripheral pulmonary vasoconstriction, and improve oxygenation of the blood, Tab. Fruselac (Spironolactone + Furosemide) 1-0-0 to decrease the chances of heart failure and Tab. Pan (Pantaprozole) 40mg 1-0-0.

Discussion:

ToF is the most frequent cyanotic inherited heart irregularity, inherited heart irregularities are the foremost cause of newborn death rate. Even after getting screened at earlier ages there are some cases that may not exhibit the appropriate signs and symptoms for conformational diagnosis. The exposition of signs and symptoms depends on the severity associated with the pulmonary blood flow obstruction and also with the severity of cyanosis (amount of oxygen levels). Cases with severe pulmonary obstruction or with severe cyanotic may require immediate emergency attention and care in order to prevent the mortality rate [(4).] The patients should be assessed mainly for all the four abnormalities that are presented in ToF (Pulmonary stenonsis, Ventricular septal defect, overriding of aorta and right ventricular hypertrophy). In the present case study the diagnosis of ToF was done based on systematic approach and vital signs and symptoms were managed with necessary medication therapy as mentioned above, which improved the patient condition better.

Conclusion:

Tetralogy of Fallot is a condition that is primarily present in infants it should be carefully observed and diagnosed at the earlier ages. All the infants who are presented with the signs such as cyanosis, clubbing, tet spells, genetic anomalies and significant family histories should be screened for ToF and necessary surgical correction should be done as early as possible. In the present case study if the patient had been diagnosed earlier in her childhood for TOF, she would not have been suffered at teenage and quality of life would have been improved to later ages of life. It is the noteworthy for all the physicians and other healthcare professionals to screen the patients for ToF in the early age group and induction of necessary pharmacotherapy/surgical intervention in order to minimize morbidity and mortality rate in early childhood/teenage.

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Abbreviations used:

ToF: Teratology of Fallot; ECG: Echocardiogram; CHD: congenital heart defect; VSD: Ventricular septal defect; IAS: Intact atrial septum; RVH: Right ventricular hypertrophy.

Conflict of Interest:

Authors do not have any conflict of interest.

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