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Sudden death in aortic stenosis: A case report

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ABSTRACT

An interesting case of sudden death of a 30-year old female with calcific aortic stenosis is presented in this paper. The body was brought to the Mortuary of the Regional Institute of Medical Sciences, Imphal for autopsy with the history of assault by a lady assailant. Sudden deaths in apparently healthy individuals especially under some unusual circumstances often give rise to serious medicolegal questions.

Keywords: Calcific aortic stenosis, trivial trauma, heart failure, sudden death

Introduction

Sudden or unexpected deaths may occur from natural as well as unnatural causes. Sudden deaths in apparently healthy individuals especially under some suspicious or mysterious circumstances often give rise to questions relating to the cause, nature and circumstances of death of the person. One of the most important causes of sudden death include coronary artery disease (narrowing and obliteration of lumen) followed by conditions involving other systems[1]. Aortic stenosis is a condition in which the aortic valve cusps become thickened, firm, and adherent to each other reducing the opening into a rigid, triangular channel. This produces a pressure load on the left ventricle, which undergoes concentric hypertrophy subsequently leading to heart failure[2]. However, sudden death, even though it appears to be uncommon, may occur even in the absence of preceding symptoms in patients with aortic stenosis[3]. Interestingly, the death of an apparently healthy person with asymptomatic aortic stenosis following an assault may pose serious problems from the medicolegal point of view as the assailant may be charged with homicide even though just a trivial trauma was inflicted to the deceased.



Figure 1. Heart showing the aortic valves which are calcified and fused reducing the aortic opening into a narrow slit

Case Report

The body of a 30-year old female was brought to the Mortuary of the Regional Institute of Medical Sciences, Imphal with the history that she was bitten on her eyebrow and forearm by her husband's mistress. She fainted and died at the spot and a case was registered against the lady assailant.

On external examination, deep cyanosis was observed with multiple petechiae on the upper part of the body. Two fresh bite marks were seen on the right eyebrow and the left forearm. No other external injuries were observed.

On internal examination, cardiomegaly with left ventricular hypertrophy was observed. The heart weighed 640 gm with multiple whitish areas on the surface of the heart. The aortic valves were calcified and fused reducing the aortic opening into a narrow slit (Figure No.1). Mitral valves were also calcified and fused. The interventricular septum was thickened and chordae tendenae were also distorted and thickened. All the abdominal and pelvic viscera were engorged.

Histopathological examination showed extensive fibrosis of myocardium (scarring) with fibrotic nodules and calcification. There was marked atrophy and hypertrophy of the cardiomyocytes. The endocardium and pericardium showed patchy areas of fibrosis, and these features were consistent with chronic Rheumatic carditis. Lungs and liver sections showed features of chronic venous congestion. The cause of death was heart failure following calcific aortic stenosis which could have been accelerated by the physical assault.

Discussion

Rheumatic endocarditis of aortic leaflets produces commissural fusion sometimes resulting in a bicuspid valve. This condition may ultimately lead to fibrosis, calcification and further narrowing of the aortic opening.

The cardinal symptoms of aortic stenosis are exertional dyspnoea, angina pectoris and syncope and the clinical symptoms appear when the valve orifice is narrowed to approximately 0.5 cm^2/m^2 body surface area. However, critical aortic stenosis may exist for years without producing any symptoms[4]. In 4% of the cases of aortic stenosis, the first symptom may be sudden death[5]. The present case belonged to this category as the victim was apparently healthy and was able to do all her household chores without any complaints. It was further learnt from the victim's relatives that she suffered from Rheumatic fever in her childhood. Sudden deaths in aortic stenosis may occur as a result of myocardial ischaemia and ventricular irritability leading to a fatal arrhythmia, which may be provoked by exertion even in asymptomatic patients[6]. In the present case, a sudden excitement or exertion associated with a trivial trauma like biting could have led to the catastrophic results. Though her death was very much inevitable without surgical intervention under the normal circumstances, the trivial trauma acted as a precipitating factor for the sudden death. This could make the lady assailant accountable even if the same injuries sustained by the victim would not have killed an ordinary healthy person. While awarding punishments to an assailant, the postmortem examination finding on the victim's body is often considered as an important factor. Hence, a meticulous autopsy examination is of immense value in the administration of justice.

Conclusion

As a condition like aortic stenosis may manifest sudden death as its first symptom, a person may be charged with homicide even though just a trivial trauma was inflicted to deceased. Thus, a meticulous medicolegal autopsy helps in proving or disproving a contentious issue arising out of such sudden deaths in apparently healthy individuals. A careful examination should be supported by a corroborative history and an active cooperation from the investigating officer for the administration of justice.

References

1. Reddy K.S.N: Sudden deaths, The essentials of Forensic Medicine and Toxicology; K.Suguna Devi, Hyderabad, 21st Edn. 2002 P.125. ()
2. Kumar V, Cotran R.S, Robbins S.L eds.: Basic Pathology, 6th Ed. W.B Saunders Company, 1999 pp 323-24. ()
3. Rosenhek R, Binder T, Porenta G, Lang I, Christ G, Schemper M, Maurer G, Baumgartner H. Predictors of outcome in severe, asymptomatic aortic stenosis. N Engl J Med. 2000 Aug 31;343(9): 611-7. PubMed ()
4. Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL eds: Harrison's Principles of Internal Medicine, Vol. 1, 15th Ed. New York, McGraw-Hill, 1994 pp 1349-51. ()
5. Aortic Valve Stenosis (http://www.medicinenet.com/aortic_stenosis/article.htm). ()
6. Souhami RL, Moxham J eds: Text of Medicine, 1st Ed, Edinburgh, Churchill Livingstone, 1990 pp 382-84. ()