# Echocardiographic Assessment of the Results of Aortic Repair in Cases of Mild to Moderate Aortic Regurge Associated with VSD

Thesis

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*بسم الله الرحمن الرحيم*

**"ويسئلونك عن الروح قل الروح من أمر ربي**
**وما أوتيتم من العلم إلا قليلا"**

**صدق الله العظيم**
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***Ahmed Abdel-Rahman***
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# ABSTRACT

***Background:*** Aortic valve insufficiency with ventricular septal defect is usually treated by plication of the commissures. However, long-term deterioration is common. ***Aim of the Study:*** To assess the results of aortic repair with VSD closure in patients with VSD and mild to moderate aortic regurgitation and its effect on post operative course, postoperative LV dimensions and functions, this is to decide which degree of aortic regurgitation needs to be repaired in association with VSD closure. ***Patients and Methods:*** The current study included 25 patients having VSD associated with mild to moderate aortic regurgitation who will undergo surgical closure of the VSD with repair of their aortic valve. All cases were subjected to clinical, radiological, echocardiographical assessment and surgical repair followed by postoperative assessment of LV changes. ***Results:*** All children were subjected to patch closure of VSD except for severe cases of Al where VSDs were closed and aortic incompetence were treated by valvuloplasty. Postoperatively, there was no peri-immediate or late postoperative mortality. There was successful drop in pulmonary systolic pressure in addition to a significant improvement of left ventricular echocardiographic data in all groups regarding LVESD, LVEDD, EF, SWT (though statistically insignificant), PWT and LV muscle mass. ***Conclusion:*** Early detection and management of VSD associated with Aortic valve incompetence is helpful in management of these children with best results.

**Keywords:**

Aortic valve
VSD
Echocardiographic

# INTRODUCTION

# INTRODUCTION

Ventricular septal defect and aortic valve incompetence is a well-known association ***(Van Praagh and McNamara, 1968)***. Prevention of the aortic valve incompetence is commonly obtained by early closure of a sub-pulmonary VSD ***(Chung and Manning, 1974; DeLeval et al., 1988; Dimich et al., 1973; Moreno-Carbal et al., 1977)***.

However, the management of serious aortic valve insufficiency is still controversial, especially during childhood and for adults ***(Okita et al., 1988)***.

In 1973, Trusler and associates described a surgical technique that was widely used; the prolapsed cusp was plicated on the commissural areas with intra-aortic and extra-aortic wall pledgets ***(Trusler et al., 1973)***.

Other techniques were described, the basic concept was folding of the free edge of the prolapsed leaflet by a continuous suture ***(Soyer et al., 1975; Spencer et al., 1973)***.

Despite improvements in surgical management, the method of choice remains unclear because of early and late failures ***(Ohkita et al., 1986)***. Another approach for aortic valve repair was used since 1977 by triangular resection of the prolapsed cusp, reinforcement of the aortic wall and an aortic annuloplasty ***(Carpentier, 1988)***.

Aortic cusp prolapse is considered a risk factor for progressive aortic regurgitation in patients with a doubly committed sub-arterial VSD ***(Komai et al., 1997)***. It also occasionally complicates peri-membranous VSD.

In both types of VSD, aortic regurge deteriorates slowly or remains mild for a long time following detectable aortic cusp prolapse.

Early surgery to prevent progressive aortic regurge is commonly recommended for a VSD complicated by aortic cusp prolapse.

Recently, the number of patients requiring aortic valve repair for aortic regurgitation associated with VSD has been markedly decreased because the mechanism of its occurrence is well understood, and the patients are immediately referred for closure of VSD when progression of prolapse of the aortic cusp or aortic regurge is detected ***(Tatsuno et al., 1973; Tohyama et al., 1997; Schmidt et al., 1988)***.

Patch closure alone for this type of VSD if the grade of the associated aortic regurge is mild or less has been found to prevent further progression of aortic regurge in several recent postoperative follow up studies ***(Komai et al., 1997; Backer et al., 1991)***.

# AIM OF THE WORK

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The aim of this study is to:

1. Assess the results of aortic repair with VSD closure in patients with VSD and mild to moderate aortic regurgitation, and
2. Assess its effect on post-operative course, post-operative LV dimensions and functions, and
3. This is to decide which degree of aortic regurgitation needs to be repaired in association with VSD closure

# REVIEW OF LITERATURE

# EMBRYOLOGY

The heart forms as a specialized pump portion of the vascular system, rather than as a pumping organ in itself ***(Wenink, 1987)***.

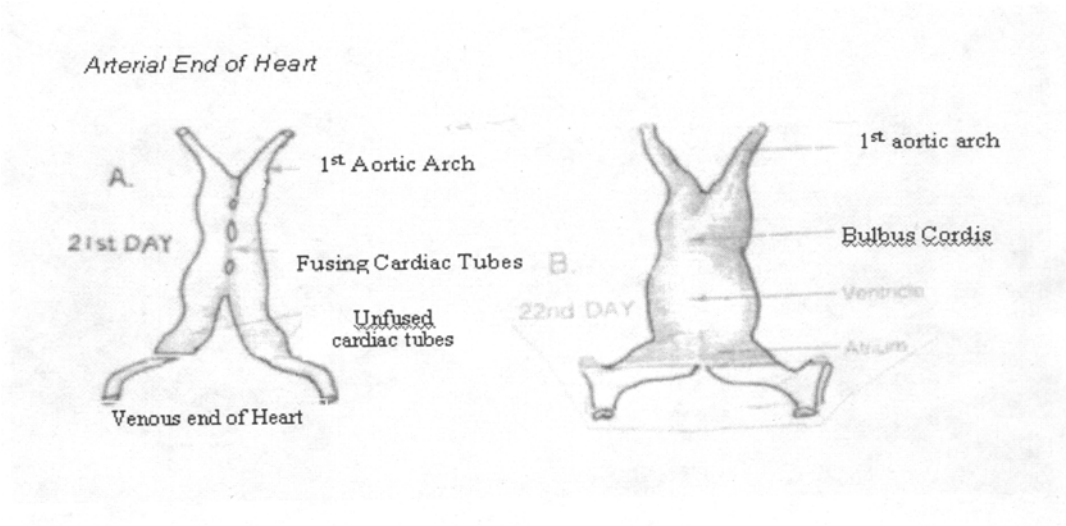


**Fig. (1)**: Fusion of the two cardiac loops **(Amplatz and Castneda, 1986)**.

Development of a vascular system is an early necessity in human embryology. So, at **18th day** of gestation a special site of blood vessel formation is found in ***the mesoderm*** at the anterior edge of the embryonic disc. This is the ***cardiogenic area*** where many small vessels unite to form two distinct heart tubes (right and left) which fuse to give rise to a single straight endocardial heart tube. This process of fusion begins cranially and progress caudally (**at 21 day of gestation**) **(A*mplatz and Castneda, 1986)*** (Fig. 1).