

Ischemic VSD

Mohamed S. Ahmed* MBChB , FICMS
Firas F. Ibrahim* MBChB , FICMS

Summary:

Background: Ischemic VSD or ventricular septal rupture (VSR) is a rare but lethal complication of myocardial infarction (MI). Multi-system coronary disease is present in more than 50% of these patients. The event occurs 2-8 days after an infarction and often precipitates cardiogenic shock. The differential diagnosis of postinfarction cardiogenic shock should exclude free ventricular wall rupture and rupture of the papillary muscles. To avoid the high morbidity and mortality associated with the disorder, patients should undergo emergent surgery. Concomitant coronary artery bypass may be required.

Objective: This study stressed on a very serious complication of a common pathology (myocardial infarction), despite its lethal complication but still it is treatable and still surgery is the only salvageable option.

Patients & methods: Retrospective study of 7 consecutive cases with ischemic VSR encountered from (1st Jan. 2008-30 of September 2011). All of the cases were carefully assessed & fully investigated preoperatively (by echocardiography study, catheterization ...etc) & for all of them emergency open heart surgery was done with heart lung machine to close a post infarct VSD using synthetic patch and ventriculotomy closed with reinforced Teflon felts , all of them(except the last case which died immediately post operatively) stayed for 2-3 days in the CICU under follow up .

Results: Seven patients have been operated upon, 4 males (57%) and 3 female (43%), and their ages ranged between 50-63 years (75% in the 6th decade). Three of them (43%) were diabetic only but all of them were hypertensive. All of them were haemodynamically unstable so operation carried on emergently within 12-18 days post infarction (one operation done within 27 hours of infarction) and in none of them the clinical status helped to postpone them until more than 3 weeks post infarct. Five Out of the seven patients survived the operation, one died immediately post operatively & another one died 7 days post operatively due to renal failure (due to pre operative impaired renal function). Operative & early post operative mortality is (28%).

Conclusion: We need to be more aware about this fatal complication of acute MI taking in consideration its late presentation (2-8) days.

We have to work hardly to improve early revascularization to decrease the incidence of VSR. Improvement in surgical technique using double patch and glue improve mortality & morbidity rates. More cases need to have a better understanding & management of these cases.

Keywords: VSD, Ischemic , surgical repair ,specialist cardiothoracic surgeon, Medical city, Iraqi Center for Heart Diseases.

J Fac Med Baghdad
2012; Vol.54, No. 3
Received Nov.2012
Accepted May2012

Introduction

Ischemic VSD or ventricular septal rupture (VSR) is a rare but lethal complication of myocardial infarction (MI).multi-system coronary disease is present in more than 50% of these patients (1). The event occurs 2-8 days after an infarction and often precipitates cardiogenic shock. The differential diagnosis of post infarction cardiogenic shock should exclude free ventricular wall rupture and rupture of the papillary muscles. To avoid the high morbidity and mortality associated with this disorder, patients should undergo emergent surgery (2, 3, 4,5) Concomitant coronary artery bypass may be required. Latham first described this condition at autopsy in 1847 , by the late 1960 , early surgical repair was proposed for patients whose conditions were deteriorating despite medical therapy(6) . Most patients die within the first week, almost 90% die within the first year (6). Although many medical advances have been made in the nonsurgical treatment of these patients

, including intra-aortic balloon counter pulsation (IABCP), these methods have not replaced the need for surgery , yet very rarely surgery can be substituted by per catheter occluder use (7).Clinical features The sites of rupture are the anterior septum (60%) and the posterior septum (40%), The most consistent finding is a murmur, In the differential diagnosis, exclude mitral regurgitation from papillary muscle rupture . Diagnosis is confirmed with the aid of echocardiography and the presence of a left-to-right shunt. Catheterizations results help determine the extent of CAD. Of patients treated without surgery, 90% will die & surgery must be emergent, even if the patient is stable.Surgical management (6) The conduct of the operation includes bi-caval cannulation with tapes. Cardiopulmonary bypass is instituted and after giving cold cardiologic solution the heart is arrested, the VSD is approached through the left ventricle. In apical

ventriculoseptal defects, the apical septum approached via the anterolateral infarct that is almost always present. There may be an aneurysm. The apical septal defect is repaired with a Dacron patch with pledgets on the right ventricular side and the suture is then brought up through the left ventricular side through the Dacron patch (Fig. 1&2). Double patch technique is now in use in most centers (8).

Patients & Methods:

Retrospective study of seven consecutive cases with ischemic VSR referred from medical department in the Iraqi center for heart diseases to our surgical department from 1st January 2008 to 30th of September 2011. In most of the patients deterioration in hemodynamic state occurred 5-7 days post infarction (in one it occurred immediately) and all the patients needed preoperative intra aortic balloon pump and high inotropic drugs support in the form of dobutamine 10 Mic.kg\min. and some times more. All of the cases were carefully assessed and fully investigated by echo study and catheterization and for all of them emergency open heart surgery was done with heart lung machine to close a post infarction VSD using synthetic patch and ventriculotomy closed with re enforced Teflon felts, all of them (except the last case which died immediately post operatively) stayed for 2-3 days in the CICU under follow up. Most of the patients are now under follow up and are doing well (6-12 months post operatively) with good health and echocardiographic parameters.

Results:

Ages between 50-63. 4 males (57%) & 3 female (43%) 3 of them (43%) were diabetic only but all of them were hypertensive. All of them were haemodynamically unstable so operation carried on emergently within 12- 18 days post infarction (one operation done within 27 hours of infarction) and none of them clinical status helped to postpone them until more than 3 weeks post infarct (operations carried on in 24-72 hours from referral to the surgical department). Pre operatively all the patients got large anterior infarcts (100%) through which the LV was entered to close the anteriorly located VSR in all cases (100%) Single double velour Dacron patch used to close the VSR with CABG in all cases (100%). Five of the seven patients survived the operation, one of the patients died 8 hours postoperatively in the CICU due to low cardiac output & another patient died 7 days post operatively due to renal failure (due to pre-operative impaired renal function). So Operative mortality is (28%). Echocardiography was used to assess the quality of repair post operatively which showed adequate closure with fair to good left ventricular ejection fraction. The five other patients discharged well and are now under follow up.

Discussion:

Post infarction VSD repair remains surgically challenging procedure with high risk of mortality & morbidity (8). This severe complication of acute MI. becomes uncommon in the era of reperfusion therapy (7) Post infarct VSD have higher mortality reaching to 50% while those who can be postponed more than 3 weeks the mortality drops to 6% only (9). Time related survival after repair of post infarct VSD less than optimal (5-yr. survival 44-57% & 10-yr. 29-36%) (6, 10) Generally this complication incidence is 1-2% of patients with acute MI (6) in our Centre we had received 9 cases in 42 months, two of them passed during preparation for surgery (preoperatively) & (7) of them underwent surgical repair of the VSD. still we need more awareness about this fatal complication of acute MI. (which might be miss-diagnosed or under-estimated) probably due to the late presentation (2-8 days) so some of the patients might be discharged home without noticing simple murmur few days post infarction. In our study the mean age was 55 years while in the other studies was higher above 65 years (11). the difference in the age might be attributed to the late presentation of ischemic heart diseases in the western countries due to the improvement in healthy life style which postpone the incidence of such disease.

The 7 patients underwent closure of the VSD through left ventriculotomy using classical single patch technique (Although a double patch with glue in between become more popular with lower morbidity & mortality (8) yet unfortunately we don't have the glue used in this procedure), and fortunately we didn't have any recurrence of the VSD post operatively even in the patient who had died (as documented by echo-study 3&5 days post operatively) as he died because of renal failure 7 days post operatively. All of our 7 patients underwent CABG with the closure of the VSD, yet in other studies only 50% of the patients has associated revascularization, we did grafts to all patients because we had no viability test to the myocardium to decide the patient with infarction that needs graft or not. So we preferred to do graft to all the patients and so those who need the grafts will do better and those who don't (lost myocardium) will not be harmed from grafts. In our 7 cases mortality was 28% compared to other studies 30-50% and those used double patch with glue the mortality was 27% (8).

Conclusions:

We need to be more aware about this fatal complication of acute MI taking in consideration its late presentation (2-8) days. We have to work hard to improve early revascularization to decrease the incidence of VSR. Improvement in surgical technique using double patch and glue improve mortality & morbidity rates. More cases to be done to have a better understanding & management of these cases.

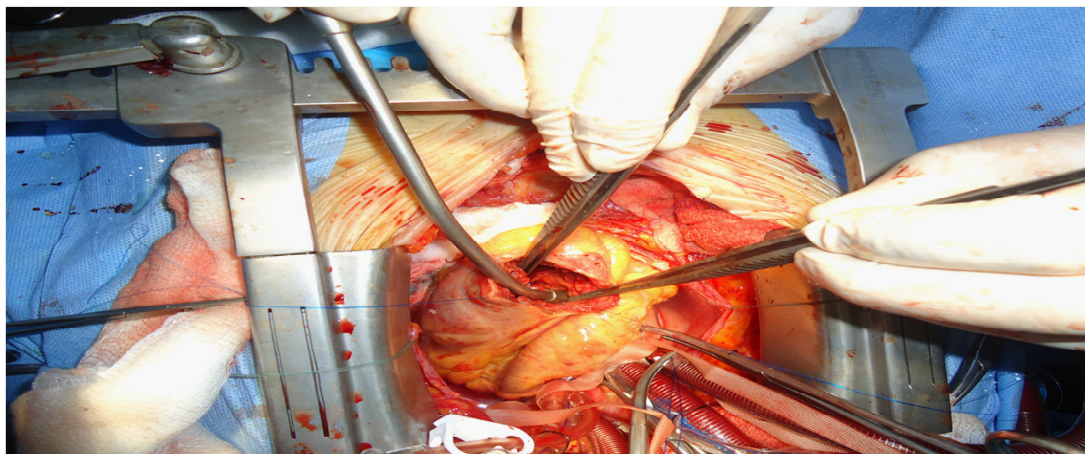


Fig .1: Operative view of the septal defect with the cardiomy sucker inside the defect and the two pickups marking the edges of it

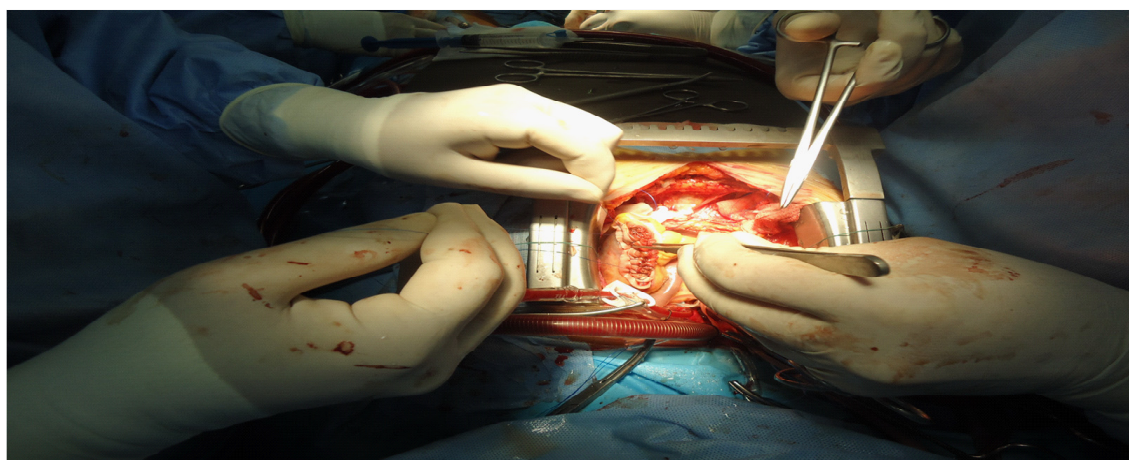


Fig .2: The final closure with Teflon felts on edges of the ventriculotomy

References:

1. Crenshaw BS,granger CB,Birinbaum Y,Piper KS,Morris DC,Kleiman NS,et al.risk factors, angiographic patterns, and outcome in patients with VSD complicating acute MI.circulation 2000;101:27
2. David TE. Operative management of postinfarction ventricular septal defect. Semin Thorac Cardiovasc Surg. Oct 1995;7(4):208-13. [Medline].
3. Gaudiani VA, Miller DG, Stinson EB, et al. Postinfarction ventricular septal defect: an argument for early operation. Surgery. Jan 1981;89(1):48-55. [Medline].
4. Daggett WM, Buckley MJ, Akins CW, et al. Improved results of surgical management of post infarction ventricular septal rupture. Ann Surg. Sep 1982; 196(3):269-77. [Medline].
5. Shabir Bhimji, MD, PhD, Ventricular Septal Rupture Following Myocardial Infarction,eMedicine specialities,thoracic surgery,cardiac,last updated nov 7.2008.
6. Nicholas T,Eugene H,Donald B,Frank L,Robert B,kirklin/barrat-boyes,cardiac surgery,pst infarction VSD,3rd edition,2003,p456-471.
7. Matthew J Boyle, Amul K Sibal, Peter N Ruygrok, Mark Edwards, Peter Alison, Hybrid management of an unusual presentation of acute ischaemic ventricular septal defect, of the Journal of the New Zealand Medical Association, 07-November-2008, Vol 121 No 1285 (journal)
8. Claude Deville*, Louis Labrousse, Emmanuel Choukroun and Francesco Madonna, multimedia manual of cardiothoracic surgery, Surgery for post-infarction ventricular septal defect (VSD): double patch and glue technique for early repair.
9. Fritz J. Baumgartner, M.D.,,cardiothoracic surgery, coronary artery disease,iischaemic VSD and mitral regurge,3rd edition,2003,p79-82.
10. Deja MA, Szostek J,Widenka K,Sazafron B,Spyt TJ,Hickey MS,et al.post infarction VSD-can be do better? Eur J cardiothoracic surg 2000;18:194
11. Vittorio Montani,Giovani Mariscalco,Crestian Leva, Claudio Blanzola,Andrea Sala: surgical repair of post infarction VSD:19 years of experience, in:international journal of cardiology (4 April 2006), vol. 108,issue 2,pages 202-6.