CASE REPORT

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Successful surgical closure of a ventricular septal rupture following an acute myocardial infarction. Case report

Cierre quirúrgico exitoso de ruptura del septum ventricular posterior a infarto agudo de miocardio. Informe de un caso

Orlando Romero-Meneses,* Lorena Muñoz-Ramos‡ and Bertín Ramírez-González‡

* Cardiology Department.

‡ Cardiothoracic Surgery Department; Unidad Médica de Alta Especialidad, Hospital de Cardiología No. 34 "Dr. Alfonso Treviño Treviño"; Instituto Mexicano del Seguro Social. Monterrey, Nuevo León, México.

ABSTRACT

Ventricular septal rupture is a rare yet severe complication of acute myocardial infarction. Delayed surgical closure is the treatment of choice in select cases. We present the case of a 71-year-old woman with anterior myocardial infarction who developed an apical ventricular septal rupture following late percutaneous coronary intervention. Echocardiography confirmed a 1.2 cm defect with a left-to-right shunt. The cardiology team recommended surgical closure, which was successfully performed on day 21 post-infarction. The patient experienced adequate recovery after a postoperative hemorrhagic complication and was discharged with clinical improvement. Delayed post-infarction closure may be beneficial in stable patients. This case supports an individualized and multidisciplinary approach.

Keywords: acute myocardial infarction, cardiogenic shock, heart failure, post–myocardial infarction, mechanical complication, ventricular septal rupture.

RESUMEN

La ruptura septal ventricular es una complicación poco frecuente pero grave del infarto agudo de miocardio. El cierre quirúrgico tardío es el tratamiento de elección en casos seleccionados. Presentamos el caso de una mujer de 71 años con infarto de miocardio anterior que desarrolló una ruptura del tabique ventricular apical después de una intervención coronaria percutánea tardía. La ecocardiografía confirmó un defecto de 1.2 cm con un cortocircuito de izquierda-derecha. El equipo de cardiología recomendó cierre quirúrgico, que se realizó con éxito el día 21 postinfarto. La paciente experimentó una recuperación adecuada después de una complicación hemorrágica postoperatoria y fue dada de alta con mejoría clínica. El cierre diferido postinfarto puede ser útil en pacientes estables. Este caso respalda un abordaje individualizado y multidisciplinario.

Palabras clave: *infarto agudo de miocardio, choque cardiogénico, insuficiencia cardíaca, infarto agudo de miocardio, complicación mecánica, ruptura del tabique interventricular.*

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Correspondence: Dr. Orlando Romero Meneses. E-mail: Oromen1409@gmail.com

Abbreviation:
VSR = ventricular septal rupture

The three main types of mechanical complications following acute myocardial infarction are: ventricular septal rupture (VSR), free wall rupture of the left ventricle, and severe acute mitral regurgitation secondary to papillary muscle rupture.[1] These complications typically occur early, within the first 48 hours after symptom onset, and are generally associated with occlusive coronary artery disease in the absence of collateral circulation.

In the case of VSR, onset typically occurs between the first 24 hours and days 3 to 5 following the onset of infarction symptoms.[2] VSR carries a high mortality rate, ranging from 50 to 80%, primarily attributed to ventricular failure secondary to large infarcts.[3]

CASE DESCRIPTION

We report the case of a 71-year-old female who presented with a 10-day history of anterior myocardial infarction. She received delayed reperfusion therapy via percutaneous coronary intervention to the left anterior descending artery on day 5, where acute thrombotic occlusion was identified and successfully treated with stent placement. The remaining coronary arteries showed no significant lesions.

While under observation, a holosystolic murmur was detected over the mid-precordium, raising suspicion of a mechanical complication. Transthoracic echocardiography confirmed the presence of an apical VSR, measuring 1.2 cm, with a left-to-right shunt and an interventricular gradient of 50 mmHg. Left ventricular ejection fraction was 48%, with regional akinesia involving the apex and apical segments of the lateral, anterior, and septal walls.

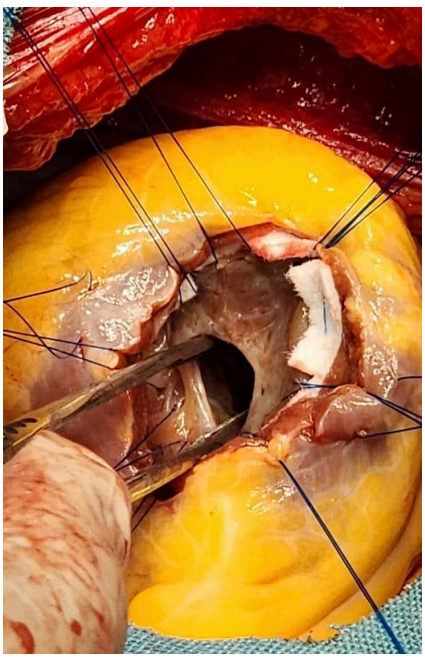

Figure 1:

Debridement of the necrotic muscle portion of the apical defect due to a 9-mm ventricular septal defect is observed, as well as placement of 3/0 polypropylene U-shaped sutures along the anterior edge of the defect.

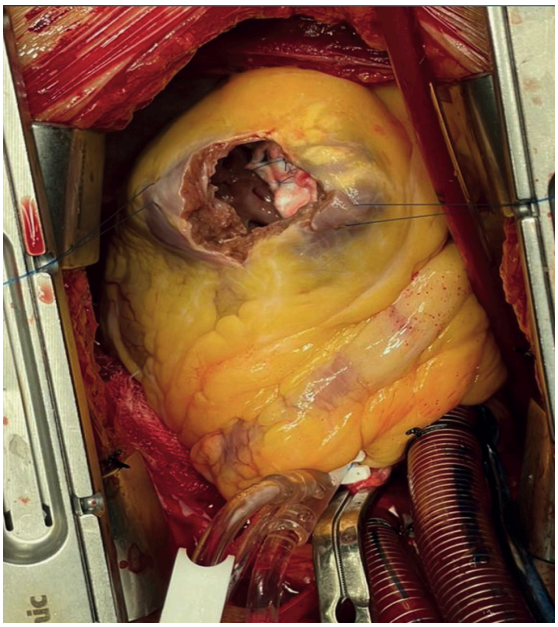

Figure 2: Left ventriculotomy in the infarcted inferior wall, lateral to the interventricular septum, identifying the ventricular septal defect.

The case was evaluated by the institution's heart team, which determined that due to the location of the defect, surgical closure was preferred. The patient remained under close observation in the coronary care unit, following literature-based recommendations that suggest delaying surgery to improve outcomes. Surgical intervention was performed on day 21 post-infarction. Intraoperatively, a 9-mm septal defect was identified *(Fig. 1) (Fig. 2)*, and successfully closed using a 15.2 × 15.2 cm polytetrafluoroethylene patch.

During the immediate postoperative period, the patient experienced higher-than-expected bleeding, prompting surgical re-exploration; however, no active bleeding was found, and no further intervention was required. The patient remained in the postoperative care unit, experienced early extubation, and progressed adequately. She developed acute kidney injury, which resolved within the first few days. After being transferred to the general ward, she began mobilization and ambulation, and was eventually discharged with clinical improvement.

COMMENTARY

According to international literature, the mortality rate for post-infarction mechanical complications exceeds 80%.

However, there is still ongoing debate regarding the optimal management approach and ideal timing for surgical repair.[4] Given the high mortality rate associated with post-infarction ventricular septal rupture, prompt recognition and timely intervention are crucial. Our case highlights the importance of a multidisciplinary approach and careful consideration of the optimal timing for surgical repair, which can significantly impact patient outcomes.

CONCLUSIONS

We report the case of a geriatric patient who underwent successful surgical intervention. Although there is no universally accepted guideline on the ideal timing for defect closure, it has been proposed that surgical repair performed after 18 days post-infarction yields better outcomes, as myocardial tissue is less friable. This was consistent with our patient's case, in which delayed intervention resulted in a favorable outcome.

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