

Surgical Treatment of Rare Giant Inferoposterior Left Ventricular Aneurysm: A Case Report

Saygin Turkyilmaz, Ali Aycan Kavala, Gulsum Turkyilmaz, Yusuf Kuserli

Department of Cardiovascular Surgery, Bakirkoy Dr.Sadi Konuk Training and Research Hospital, Istanbul, Turkey

ABSTRACT

We present the case of a 63-year-old male with post-myocardial infarction causing a giant left ventricular aneurysm and describe the surgical treatment via Dor Procedure.

INTRODUCTION

Left ventricular aneurysm (LVA) is described as a deteriorated and paradoxical bulged segment of the left ventricle (LV) with dyskinesia or akinesia, which impairs the left ventricular ejection fraction (LVEF). True LVAs have involvement with the full thickness of the LV and are seen in 10% to 35% of post-MI patients. Most of the true LVAs arise from the acute infarcted myocardial sites, which are supported by the left anterior descending artery (LAD) (88%) or the dominant right coronary artery (RCA) [Glower 2008; Inan 2012].

The choice of surgical treatment in LVAs mainly consists of two techniques, namely linear reconstruction (plication and linear repairs) and endoventricular circular patch plasty (EVCPP) (Dor procedure) [Parolari 2007]. The majority of the aneurysms in the inferoposterior portion of the heart are pseudoaneurysms and true aneurysms are rarely seen in this localization [Subban 2009]. We present a true aneurysm in the inferoposterior segment of the heart, which was treated with Dor procedure.

Patient Profile: A 63-year-old male was admitted to the hospital with shortness of breath, orthopnea, and moderate bilateral pretibial edema. He had a history of recurrent admissions to the emergency room with these symptoms over the last three months and was diagnosed and treated for congestive heart failure. Electrocardiogram revealed Q-waves and ST-segment elevation in the inferior leads. Minimal cardiomegaly was present in the chest X-ray. Echocardiography showed a large aneurysm with the dimensions of 8 cm × 7.2 cm which originated from the inferoposterior wall of the LV. The aneurysm sac was filled with thrombus and connected with the LV through a wide neck of 5.5 cm in diameter. The

ejection fraction was 30% with a hypercontractile LV. Mild aortic and mitral valve regurgitation was detected. The coronary angiography demonstrated a total occlusion in circumflex artery (Cx) and 90% stenosis both in the proximal LAD and RCA.

Surgical Technique: Cardiopulmonary bypass (CPB) was constituted and antegrade cold blood cardioplegia was used to arrest the heart. A vertical incision approximately 2.5 cm lateral to the Cx artery was done in the posterior wall to reach the aneurysmal sac. The thrombus was observed in the sac and removed. The healthy LV wall was determined and the scar tissue was trimmed. Dacron patch was prepared for implantation over the tissue defect. The patch was implanted with continuous fashion with 3/0 prolene after estimating the actual ventricular diastolic cavity (Figure 1-2). The ventriculotomy was closed using two Teflon felts with 2/0 propylene to reinforce the ventricular wall (Figure 3). A coronary artery bypass grafting (CABG) operation was done using saphenous vein grafts to the RCA posterior descending artery branch, Cx obtuse marginatum branch, and the left internal mammary artery (LIMA) graft to LAD. The cross clamp and the CPB times were 67 minutes and 92 minutes, respectively. The patient was extubated in the 13th hour postoperatively and discharged on the postoperative 7th day without complications. Acetylsalicylic acid 300 mg and warfarin 5 mg was prescribed to achieve a target of International Normalized Ratio (INR) value between 2 and 2.5. Physical examination showed no signs of cardiac failure and echocardiography revealed improved cardiac functions in the follow-up visit three months after the operation.

DISCUSSION

Although linear reconstruction widely has been the choice in the treatment of LVA, there are several disadvantages of this technique, including the persistence of dyskinetic or akinetic areas in the ventricular septum and distortion of LV, which leads to inadequate LV contraction [Ohara 2000; Raja 2009].

Dor et al. were the first to report a circular patch plasty technique to reconstruct the LV (endoventricular circular plasty), which then gained a great reputation among many other surgeons [Dor 1989]. There are several advantages of EVCPP procedure, such as maintaining physiological cavity formation, precisely exclusion of the akinetic portion of LV and possibility to achieve complete resection of the aneurysm.

Received October 14, 2018; accepted February 28, 2019.

Correspondence: Saygin Turkyilmaz, MD, Bakirkoy Dr Sadi Konuk Training and Research Hospital, Department of Cardiovascular Surgery, Tevfik Saglam Cad No:11 34147/Bakirkoy, Istanbul, Turkey; +90-505-255-79-93; fax: +902125424491 (e-mail: sygnaty@hotmail.com).



Figure 1. A true left ventricular aneurysm in inferoposterior location.

Ventricular geometry is the mainstay of a healthy LV function and EVCPP technique typically helps to restore the ventricular geometry by reducing end-diastolic volume (EDV) which ultimately reduces the regional wall tension [Tekümit 2010]. Moreover, it has been shown that reduced EDV was associated with an improvement in ejection fraction. Hence, surgical treatment of the patients with large EDVs are predicted to show more promising results than the patients with smaller EDV postoperatively.

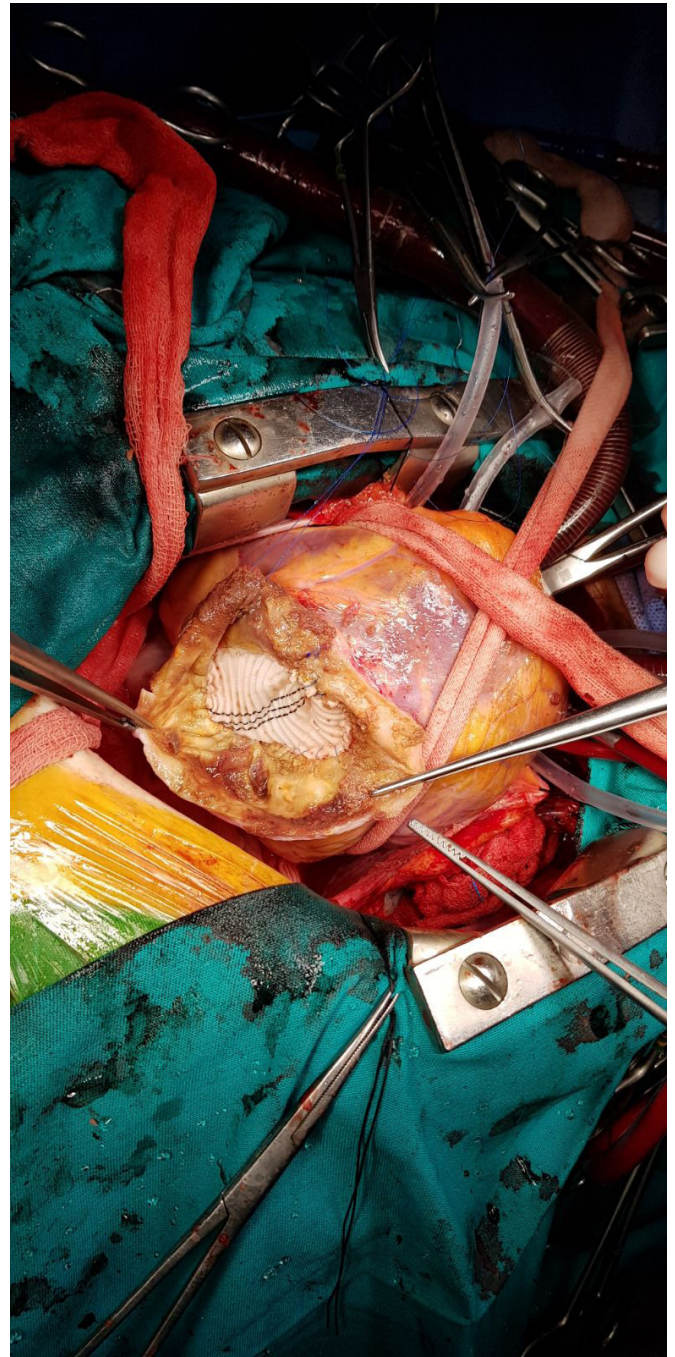


Figure 2. Dor Procedure with dacron graft.

In many studies, it has been reported that Dor procedure had low mortality (10%) rates in cases with akinetic myocardial scar, significantly improved LV functions, and restored the shape and function of the LV. These results were interpreted as the outcomes of early and extended follow-ups of Dor procedure and are more satisfactory than linear repair technique [Subban 2009; Ohara 2000; Dor 1998; Calafiore 2003].

Shapira et al reported that despite similar effects on the LV geometry following both surgical techniques, the Dor

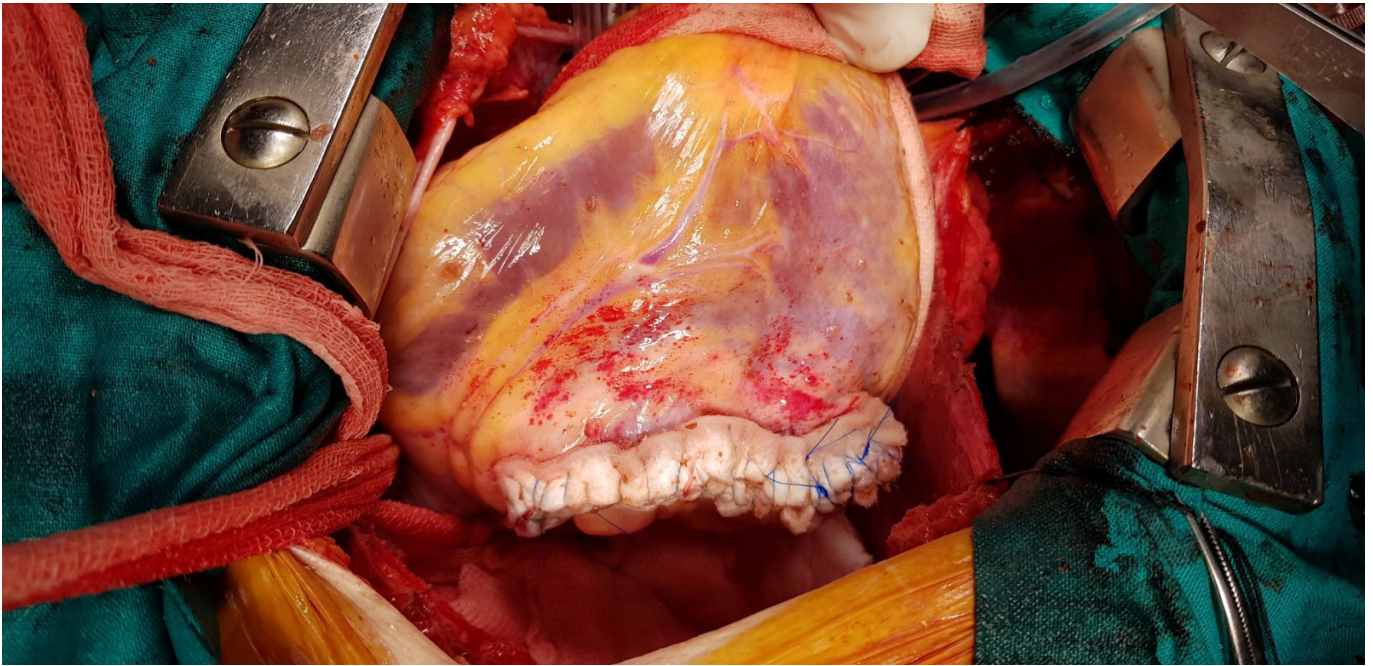


Figure 3. Aneurysm repair completed.

procedure is associated with improved LVEF, long-term clinical recovery, and functional capacity [Shapira 1997].

In conclusion, inferoposterior LVA repair can be performed via Dor procedure. The mitral valve functions and need for CABG should be properly assessed perioperatively. Long-term survival as well as improved cardiac functions can be achieved by using this technique together with coronary revascularization, if needed.

REFERENCES

- Calafiore AM, Gallina S, DiMauro M et al. 2003. Left ventricular aneurysmectomy: Endoventricular circular patch plasty or septoexclusion. *J Card Surg* 18:93-100.
- Dor V, Saab M, Coste P et al. 1989. Left ventricular aneurysm: A new surgical approach. *Thorac Cardiovasc Surg* 37:11-19.
- Dor V, Sabatier M, Di Donato M et al. 1998. Efficacy of endoventricular patch plasty in large postinfarction akinetic scar and severe left ventricular dysfunction: Comparison with a series of large dyskinetic scars. *J Thorac Cardiovasc Surg* 116:50-59.
- Glower DD, Lowe JE. 2008. Left ventricular aneurysm. In Cohn LH (ed): *Cardiac Surgery in the Adult*. McGraw-Hill, New York, pp. 803-822.
- Inan MB, Yazicioglu L, Acikgoz B, Tasoz R, Ozyurda U. 2012. Giant posterolateral left ventricular aneurysm diagnosed 6 weeks after incomplete surgical revascularization. *Ann Thorac Surg* 93:980-982.
- Ohara K. 2000. Current surgical strategy for post-infarction left ventricular aneurysm—from linear aneurysmectomy to Dor's operation. *Ann Thorac Cardiovasc Surg* 6:289-294.
- Parolari A, Naliato M, Loardi C et al. 2007. Surgery of left ventricular aneurysm: A meta-analysis of early outcomes following different reconstruction techniques. *Ann Thorac Surg* 83:2009-2016.
- Raja SG, Salehi S, Bahrami TT. 2009. Impact of technique of left ventricular aneurysm repair on clinical outcomes: current best available evidence. *J Card Surg* 24:319-324.
- Shapira OM, Davidoff R, Hilkert RJ et al. 1997. Repair of left ventricular aneurysm: Long-term results of linear repair versus endoaneurysmorrhaphy. *Ann Thorac Surg* 63:701-705.
- Subban V, Makadia N, Rajaram RS, Ravikumar R, Kurian VM, Sankardas MA. 2009. Giant left ventricular aneurysm complicating silent inferoposterior myocardial infarction. *J Card Surg* 24:697-699.
- Tekümit H, Polat A, Uyar I et al. 2010. Left ventricular aneurysm using the Dor technique: mid-term results. *J Card Surg* 25:147-152.