Korišćenje Cormatrix pača za rekonstrukciju leve komore, prikaz slučaja

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Apstrakt

Stvaranje aneurizme leve komore je komplikacija koja može nastati kao posledica infarkta miokarda. Najčešće zahvata apikalni ili anterolateralni zid leve komore (85%) i prati okluziju prednje descedentne grane leve koronarne arterije. Zid prave aneurizme sadrži endokard, epikard i fibrozno ožiljno tkivo. Funkcionalno može biti akinetičan i diskinetičan. Ukoliko kod pacijenta postoje simptomi, kao što su srčana slabost, anginozni bolovi ili komorske aritmije, indikovana je elektivna operacija. Od operativnih tehnika najčešće se koristi Dorova procedura. Od materijala najčešće se koristi politetrafluoroetilen ili perikardno tkivo. Njihova mana je podlžznost kalcifikaciji i retrakciji.
Cormatrix je tkivni pač sastavljen od decelularizovane submukoze svinjskog tankog creva. Bogat je kolagenom, glikozaminoglikanima i faktorima rasta. Eksperimentalne studije, sprovođene na životinjama pokazale su da implantacija ekstracelularnog matriksa u područje infarkta srca dovodi do pojave kontraktilnih elemenata, kao i do promene u prirodnom formiranju ožiljnog tkiva

Ključne reči: Aneurizma, leva komora, Cormatrix

Using CorMatrix for the reconstruction of the left ventricle a case report

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Abstract

A left ventricular aneurysm is a complication that occurs after a myocardial infarction. It usually involves apical or anterolateral wall of the left ventricle (85%) and most often follows left anterior descending coronary artery occlusion. The wall of the true aneurysm contains endocardium, epicardium and fibrous scar tissue. It can be functionally akinetic or diskynetic. If patients present with symptoms such as heart failure, angina or ventricular arrhythmias, elective surgery is indicated. Surgical approach that is used most often is endoventricular circular ventriculoplasty described by Dor et al. Materials most commonly used for endoventricular repair are pericardial and polytetrafluoroethylene patches, but they are prone to calcification and retraction. CorMatrix is a tissue scaffold made from decellularized porcine small intestinal submucosa. It is rich in collagen, glycosaminoglycans and growth factors. Experimental studies performed on animals showed that implantation of extracellular matrix in the infracted area of the heart was followed by the appearance of contractile elements and altering typical scar tissue formation.

Key words: Aneurysm, left ventricle, cormatrix

Introduction

A left ventricular aneurysm is a complication that occurs after a myocardial infarction. It usually involves apical or anterolateral wall of the left ventricle (85%) and most often follows left anterior descending coronary artery occlusion. The wall of the true aneurysm contains, endocardium, epicardium and fibrous scar tissue. It can be functionally akinetic or diskynetic. If patients present with symptoms such as heart failure, angina or ventricular arrhythmias, elective surgery is indicated. Surgical approach that is used most often is endoventricular circular ventriculoplasty described by Dor et al.[1] Materials most commonly used for endoventricular repair are pericardial and polytetrafluoroethylene patches, but they are prone to calcification and retraction.

CorMatrix is a tissue scaffold made from decellularized porcine small intestinal submucosa. It is rich in collagen, glycosaminoglycans and growth factors. Experimental studies performed on animals showed that implantation of extracellular matrix in the infracted area of the heart was followed by the appearance of contractile elements and altering typical scar tissue formation[2,3]

Case report

Our patient is a 62 year old male that suffered a inferoposterolateral myocardial infarction five years before this hospitalization, and at that time he underwent PCI with implantation of three stents, one in left anterior descendent branch of the left coronary artery, and two in right coronary artery. A year later he was diagnosed with instent restenosis and underwent a successful POBA. After thet he was free from anginal pain until three years ago when he was diagnosed with a large aneurysm of the basal segment of the inferior wall of the left ventricle. Patient underwent regular echocardiographic exams every six months. On the last echocardiographic exam, enlargement of the left ventricle with decline in the systolic function was found. Elective surgery was indicated.

MSCT of the coronary arteries on admission showed no significant stenosis on coronary arteries and no instent restenosis. Repeated echocardiographic exam showed ejection fraction of the left ventricle to be 27% with endocavitary diameters of EDD 6.9 and ESD 6.0. It also showed large aneurysm of the inferior wall with area surface of 16.6 cm^2 and formation of the thrombus inside the aneurysm cavity.

We approached the heart via median sternotomy, after opening the pericardium a large aneurysm of the inferior wall was identified. After going on cardiopulmonary bypass, via standard central canullation, and administration of cardioplegia, aneurysm was resected (Figure 1.) and thrombus evacuated (Figure 2).

Figure 1. Opening and resecting of the aneurysm

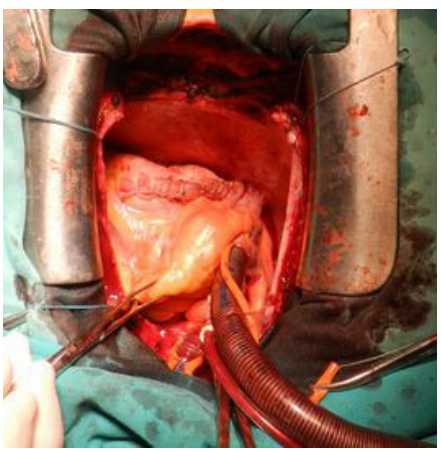

Figure 2. The thrombus evacuated from the left ventricle

CorMatrix was used as a patch for endoventricular circular plasty of the defect. After that we performed a linear closure between two strips of Teflon pledgeted felts (Figure 3). Aortic cross clamp time was 56 minutes and cardiopulmonary bypass time was 74 minutes. Postoperative echocardiography showed hypocontractile left ventricle with ejection fraction of approximately 30%, with no signs of intracavitary thrombus or aneurysm. Patient was discharged on seventh postoperative day.

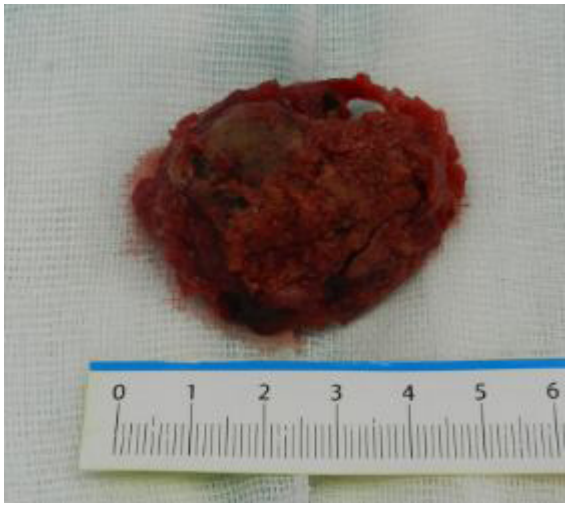

Figure 3. Linear closure of the ventricular wall over two strips of felt

Discussion

Left ventricular aneurysms are areas of thinned myocardial wall that is dyskinetic and involves full thickness of the myocardial wall. The important thing is to clinically differentiate between true and false aneurysm. False aneurysm is contained rupture of the myocardial free wall and is prone to rupture. Location of the aneurysm is important for right diagnosis. Only 4% of true aneurysms are located on the inferior wall.

Problem is, also, finding ideal material for endoventricular patching. Most commonly used materials are pericardial and PTFE patches. Problem with this materials is that they are prone to calcification and retraction. The role of extracellular matrix in cardiac repair is first shown on animal models. It has shown to promote neovascularization and even development of myocardial tissue. CorMatrix has shown to increase myocardial wall thickness and contractile activity and therefore making clinical improvement[4]. It may prove to be the closest thing to ideal patch for cardiac reconstruction. CorMatrix has also been used successfully in pediatric cardiac surgery. Although no study has shown cellular regeneration, restoration of contractile activity and increase in wall thickness support further use and study of CorMatrix for intraventricular patching [5]. Conflict of interest, none declared.

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