

CASE REPORT

Failed Coronary Angioplasty Successfully Treated with Coronary Endarterectomy: A Case Report

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Abstract:

Now-a-days, coronary artery disease patients getting more complex with multiple comorbidities like hypertension, diabetes, renal impairment and also by failed PTCA. In this case report, a 56-year old male hypertensive and diabetic patient presented with occlusion in distal part of the right coronary artery, which was initially treated with balloon angioplasty at 6 months back. However, complete occlusion of stent in right coronary artery has occurred and also patient remains symptomatic in spite of aggressive medical management. After evaluation, complete myocardial revascularization done by coronary endarterectomy including removal of the stent from right coronary artery with coronary artery bypass graft surgery. A closed technique coronary endarterectomy was performed to remove the stents, and exhibiting the technical achievability of surgically re-moving occluded coronary stents. Postoperative period was uneventful and patient got discharged on 9th postoperative day. This case report demonstrates the safety and feasibility of coronary endarterectomy in the presence of an occluded stent in the coronary arteries.

Key words: Coronary endarterectomy, Coronary angioplasty, Coronary artery disease.

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Introduction:

In the late 1957, Coronary endarterectomy was at first presented as a surgical option for myocardial revascularization by Bailey et al.¹ Coronary Endarterectomy (CE) is the expulsion of the atheromatous plaque, dismembering and isolating the outer media and adventitia layers

and CE is frequently important to perform total myocardial revascularization during CABG or to encourage anastomosis of severely calcified and diffuse coronary arteries¹. In spite of the presentation of coronary endarterectomy (CE) 60 year's prior as a strategy for treatment of diffuse coronary artery disease, its application

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remains controversial as it conveys a higher perioperative hazard and poor long term survival^{1,2}. But complete myocardial revascularization for multi vessel CAD patients has been appeared to reduce the frequency of perioperative morbidity and mortality and the duration of hospital stay^{3,4,5}.

Case presentation:

A 56 years old ex-smoker, and diabetic male presented with dyslipidemia, hypertension and previous history of coronary angioplasty in right coronary artery. Patient also have had NYHA class III angina with a positive CAG (coronary angiogram) showed 60% stenosis in the mid part of left anterior descending coronary artery (LAD) and right coronary artery (RCA) was dominant with diffuse disease, a near total occlusion (100%) in the proximal and mid part of the RCA, just proximal to the stent and also poor retrograde blood filling from LAD circulation (Figure-1). During CAG a guidewire could not be inserted via RCA and also PTCA was not feasible to performed. Aggressive Medical management was started but patient remained symptomatic throughout the course of treatment. Due to his failed medical management and progressing stable angina, the patient went for elective coronary artery bypass graft (CABG) surgery with endarterectomy.

Standard intraoperative monitoring strategies were utilized and a CPB circuit was kept on

standby for this cases. After standard median sternotomy, Heparin was used to maintain an ACT (Activated clotting time) more than 400 seconds just before dividing the harvested left internal mammary artery (LIMA). Operations was performed off pump CABG with CE (Coronary endarterectomy) and utilizing mechanical stabilizers like suction type and the compression type stabilizer to immobilize the target coronary artery during grafting. A conclusive decision to endarterectomize a vessel is made per-operatively and CE from RCA was considered in this patient because of localized complete lesion, and occlusion of stent with poor distal run-off.

Following coronary endarterectomy with removal of stent from RCA, a saphenous venous graft was performed to distal RCA with approximately 15mm incision over the stent. Left internal thoracic artery was used to graft LAD artery. The endarterectomy specimen was 11 cm long incorporated with the stent (Figure- 2) and little distortion of the stent was considered due to traction during the procedure. Histological examination of the atheroma specimen observed old thrombus occluding the lumen with fibrocartilage and macrophage (Figure- 3). The postoperative period was uneventful and patient got was discharged at 10th postoperative days. Patients was well at 6 month's follow-up and free of angina to date.

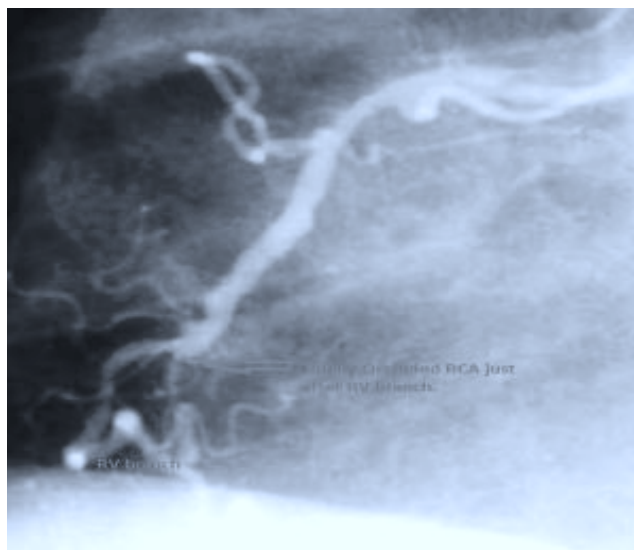


Fig.-1: Coronary angiogram showed 100% stenosis at the proximal part of RCA just after RV branch with retrograde filling through left coronary circulation.

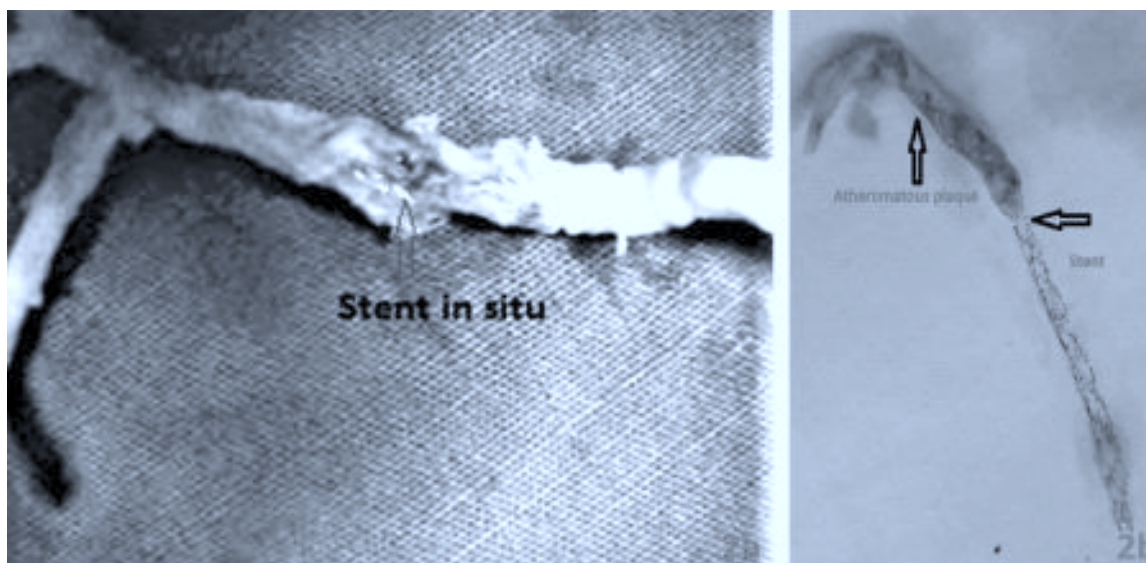


Fig.-2: Post-operative specimen of atheroma and Stent. Distorted atheromatous plaque with stent in situ (2a); Stent with atheroma (2b).

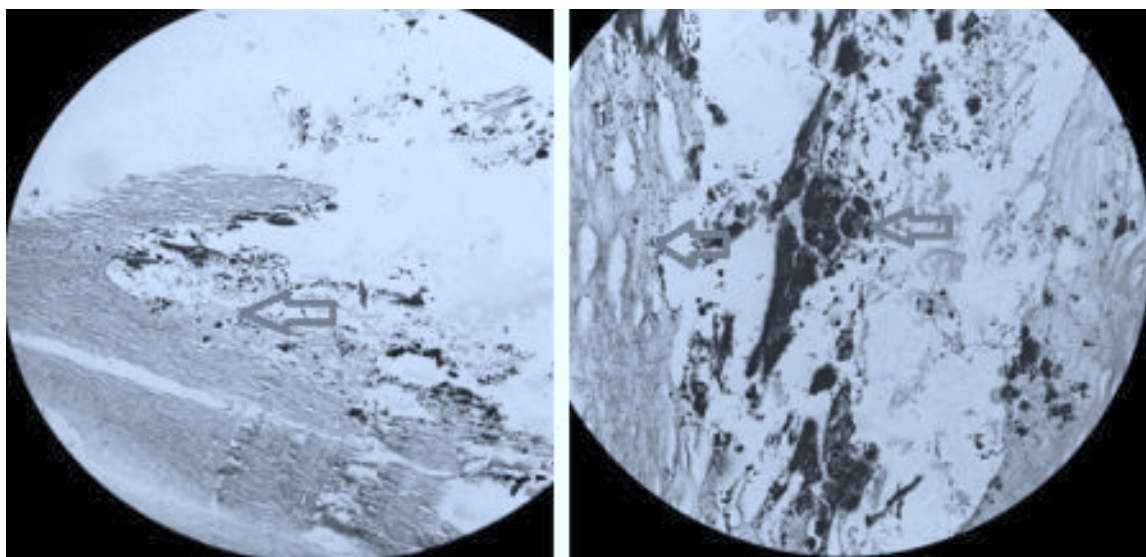


Fig.-3: Histopathological study of atheromatous plaque revealed foci of calcification, hyaline cartilage and also fibrocartilage (arrow mark).

Discussion:

In case of diffuse coronary artery disease, conventional CABG does not provide a satisfactory blood supply through the distal part of vessel, bringing about inadequate myocardial revascularisation¹. Coronary endarterectomies were performed manually by slow sustain and continuous traction of atheromatous plaque with the aid of delicate Ring Forceps, utilizing the closed methods trailed by reproduction with

anastomosis with pre-planned graft. The arteriotomy incision was roughly 8-10mm long, however that was stretched out for another 5mm in few cases, if complete removal of the plaque was not feasible^{1,2,4,5}. In our study, arteriotomy incision was approximately 15cm; which is similar to other study.

In our case atheroma was 11 cm long; however, till date the reported longest atheroma was removed from RCA which was 14 cm in size in

Bangladesh described by Ranjan et al.² There are two techniques to perform coronary endarterectomy- Closed technique and Open technique. We utilized the closed “Traction technique- slow, sustain and continuous traction” to perform endarterectomy; which is also described by Ranjan et al. in their study^{2,5-8}. But the potential dangers are inadequate expulsion of the plaque and the “snowplow effect,” to be specific, shearing-off of the plaque in the side branches^{6,9,10}. But with the “open procedure” the vision is better, and that may prompt more entire expulsion of the atheroma from the coronary vessel and its side branches. However, open technique is time consuming and required patch repair. So that, we preferred “traction technique” with careful examination of the atheromatous plaque after expulsion, which also supported by other articles also^{2,7,8,10}. To ensure complete expulsion, the atheromatous plaque carefully inspected for a smooth distal taper end. In addition, back flow of blood from the distal vessel following extraction of the atheroma is a consoling indication of adequate removal atheromatous plaque and that is special feature in OPCABG endarterectomy^{11,12}.

Anticoagulation therapy is very important in early postoperative period to prevent graft occlusion as well as native endarterectomized artery occlusion by thrombus^{9,11}. Following coronary endarterectomy, routine Heparin infusion was prescribed to prevent thrombosis in the early post-operative period followed by oral Warfarin for next 6 months, and double anti-platelet agent for life long^{2,5,10-14}. In our study, once postoperative blood draining is settle down (usually 3-4 hours following surgery), we started Heparin usually for 48 hours, followed by bridging to Warfarin (5mg) orally from 1st post-operative day. From 3rd Post-operative day, we started Warfarin (2.5-5mg) for next 6 months and dose adjusted according to INR findings (Targeted was INR 1.5-2.5). We also prescribed Clopidogrel and Aspirin (75mg) for life long following CE with OPCABG, which also described in other articles.^{2,5,15}

This present case report observed that CE (Coronary endarterectomy) with off-pump coronary artery bypass graft is attainable and accomplishes total myocardial revascularization

in presence of stent in coronary artery; when there are no other alternative options for sufficient revascularization.

Conclusion

Despite the higher risk group patients, surgical skill and the patient’s selection criteria are main stream for better outcome following CE with CABG surgery in a patient with stent occlusion, and should not be considered a contraindication to surgical revascularization.

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