Case report - Cardiopulmonary bypass
Triple coronary pathologies complicated by acute cholecystitis

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Abstract

Coronary atherosclerosis, myocardial bridge, and coronary aneurysm are different causes of myocardial ischemia. Patients with cardiac ischemia can be complicated by acute cholecystitis. A 39-year-old man referred with chest pain and cold sweating and scheduled for coronary artery bypass grafting (CABG) because of severe stenosis in right coronary artery, aneurysm of left circumflex artery, and long-segment muscle bridge in the middle part of left anterior descending artery. He developed acute cholecystitis before operation. Concomitant cholecystectomy and CABG was done. He is the first patient with three different coronary pathologies and simultaneous cholecystitis in the English-language literature who was operated on in a single session.

Keywords: Coronary artery bypass grafting; Aneurysm; Cholecystitis; Myocardial bridge

1. Introduction

Coronary atherosclerosis, myocardial bridge, and coronary aneurysm are different causes of myocardial ischemia. Coronary artery aneurysm, is uncommon [1]. Myocardial bridge is a segment of the artery that is surrounded by myocardium and can be pressed by it in each systole [2]. Patients with cardiac ischemia can be complicated by acute cholecystitis [3, 4]. Concomitant myocardial bridging and atherosclerosis [2, 5], myocardial bridging and aneurysm [1], and atherosclerosis and myocardial aneurysm [6] had been reported previously. Herein, we present a patient with such concomitant triple coronary pathologies who was scheduled for coronary artery bypass grafting (CABG) and developed acute cholecystitis before the operation. To the best of our knowledge, he is the first patient with triple coronary pathologies and simultaneous cholecystitis in the English-language literature who was operated in a single session.

2. Case presentation

A 39-year-old man was referred to us with the chief complaint of chest pain, sweating, and nausea. He was a known case of coronary artery disease which had been shown by coronary angiography some days earlier. Physical examination showed normal vital signs and cardiac auscultation. Laboratory tests showed negative troponin I and normal CK-MB (17 IU/l). Previous angiography had shown a myocardial bridge causing severe stenosis followed by an aneurysm in the middle part of the left circumflex (LCX) artery (Fig. 1) and two sites of stenosis in right coronary artery (RCA) in the proximal part (60%) and in the middle part (50%) accompanied by a long-segment myocardial bridge in the middle part of the left anterior descending (LAD) artery (Fig. 2). The patient was admitted to the hospital and scheduled for CABG. Some hours later, he developed severe abdominal pain. Physical examination showed right upper quadrant tenderness and positive Murphy sign. Abdominal ultrasonography showed multiple gall stones and distended and severely inflamed gall bladder impending to gangrene in favor of acute cholecystitis. After consultation with general surgeons, concomitant cholecystectomy and CABG was planned. At the first stage and through a right subcostal transverse incision laparotomy was done and the gall bladder was evacuated and the abdomen was sutured. Then through a median sternotomy the chest was opened and using the on-pump technique, we approached the coronary vessels. At first the muscle bridges were released then the LCX and RCA were bypassed by the saphenous vein grafts. The aneurysm was ligated. Total pump time was 40 min and total aortic occlusion time was 23 min. Postoperative course in ICU was uneventful and the patient was discharged after four days. In his last follow-up, he was well and had no complaint related to cardiac ischemia or abdominal surgery.

3. Discussion

Although the prognosis of coronary artery aneurysms is not well known [1], its prevalence was found <2% in a study [7]. Coronary aneurysms are mostly found in RCA followed by LAD, [1] but in our patient the aneurysm was detected in the LCX and more uniquely immediately after the myocardial bridge.

Mookadam and co-workers reported that LAD was the most common site of myocardial bridging [8]. In our patient...
both the LCX and LAD had bridging and the aneurysm in the LCX had most probably developed because of the preceding muscle bridge. This anomaly is not always a benign variation and might cause angina and myocardial infarction. Our patient had angina most possibly by compressing the bridging parts of the LAD and LCX during the systole; however, the significant stenosis in the LCX just before the aneurysm might play a key role.

Acute cholecystitis can complicate patients with cardiac ischemia. Abdominal surgeries in patients with compromised hearts are accompanied by more risks. Concomitant cholecystectomy and open heart surgery has been reported to be safe. Some authors reported performing cholecystectomy after coronary revascularization. In our patient, the gall bladder was highly inflamed and was impending to gangrene, so in order to prevent bile peritonitis after CABG we decided to operate on the patient concomitantly with the priority to the cholecystectomy. We decided to use two different incisions for laparotomy and cardiac surgery rather than extending one to another in order not to connect the sterile mediastinal space with the potentially infected abdominal space. After the laparotomy and the skin closure we changed all the operative instruments and approached the heart via a midsternal incision. Although in such cases using the least incisions is accompanied by less pain after the operation and might be more convenient for the patients, our patient did not have any complaint regarding the excess pain.

In such dual and complicated surgeries operative time is a major concern that might affect the total hospital stay. Total CABG and abdominal surgery time in our case was 160 min, that is obviously less than that was reported by Hirose and others (376 min) [4]. For that we discharged the patient from the hospital after four days which is again less than the mean 23 days reported by Hirose et al.

There are some concerns about the possibility of contamination due to bile spillage in the operating field in patients with edematous gall bladder and this can be a disadvantage for concomitant surgery [3], however, we did not detect any signs in favor of infection after the operation.

In conclusion, coronary anomalies similar to atherosclerotic plaques can cause cardiac ischemia. Various coronary pathologies can endanger the patient much more severely but can be operated on simultaneously. And the surgeon should be ready to manage accompanied anomalies with atherosclerotic plaques in a single session. Concomitant cholecystectomy and open heart surgery is feasible even in patients with rare simultaneous coronary anomalies and atherosclerosis.

Acknowledgment

I would like to thank Behrooz Astaneh for drafting the article.

References

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