Coronary artery bypass grafting in a patient with gout arthritis

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ABSTRACT

Ischemic heart disease is accepted as the most common cause of mortality and morbidity nearly all over the world. Gout disease is the most common condition of inflammatory arthritis among the adult population. Literature includes limited information about the treatment strategies when both the conditions coexist. In this report, we present the case report of a 63 year old male patient with the diagnosis of Gout arthritis who underwent a coronary artery bypass grafting procedure successfully.

Key words: Coronary artery bypass grafting, gout arthritis, hyperuricemia, ischemic heart disease

INTRODUCTION

Cardiovascular disorders are one of the the leading causes of mortality and morbidity today all over the world. They are endemic, and have been seen to increasingly affect a considerable number of people. They are also responsible for a major financial burden on the community and cause healthcare expenses. Although ischemic heart disease can be seen in different age groups, usually it is a disease of the aging population in whom related or un-related systemic disorders may also co-exist. On the other hand, other than the well known risk factors such as genetic inheritance, hyperlipidemia, cigarette smoking etc, it is well known that some of these co-existing systemic medical problems may also predispose to coronary artery disease.¹

Gout disease is a metabolic arthritis. It is characterized with deposition of crystals of monosodium urate due to the increased circulating levels of uric acid in the blood.² Literature includes scant reports about the co-existance of Gout arthritis and ischemic heart disease, or hyperuricemia related coronary artery disease.¹³ In this report, we present pre-, peri-, and post-operative strategies in a 63-year-old male patient with the history of Gout disease, and who underwent a successful surgical treatment for coronary artery disease.

CASE REPORT

The patient was a 63-year-old white Turkish male living in Istanbul, Turkey who presented to the clinic with increasing chest pain on exertion, which had progressed in the last six months. He was 169 cm tall and weighed 74 kg. He had been a smoker for more than 45 years, and on an average smoked 1-1.5 packs per day. His family history was negative for cardiovascular disorders. He was not hypertensive (blood pressure of 128/76 mmHg on left arm and 132/77 mmHg on right arm at rest) and did not have diabetes mellitus (overnight fasting blood glucose of 98 mg/dL, normal range: < 100 mg/dL). Blood lipid profile indicated total cholesterol and low density lipoprotein levels of 193 mg/dL (normal range: < 200 mg/dL) and 124 mg/dL (normal range: < 130mg/dL), respectively. Cardiologic check up protocol was considered and the patient underwent stress
Several prospective hour. He was taken to the ward the 
blocker (metoprolol 25 mg daily) medications and a low 
Lipidemic (atorvastatin, 20mg daily) and low dose beta-
free for more than 9 months and is on allopurinol treatment 
post-operative course initiated at the same pre-operative dosage, and this returned 
was extubated and oral intake was started, allopurinol was 
drawn in the intensive care unit. As soon as the patient 
in serum uric acid levels (7.4 mg/dl) detected in the blood 
Immediately after the surgery, there was a slight increase 
product usage was 1 units of erythrocyte suspension and 
next day and discharged on the 6th day. Blood and blood 
post-operative 4 
47 minutes, respectively. After the operation, the patient was 
cardiopulmonary bypass on arrested heart at 33-34°C. Cross 
posterior descending branch of the right coronary artery 
to LAD, aorta-first obtuse marginal artery and aorta- 
underwent triple vessel CABG (Left internal mammarian 
treatment, uric acid levels returned to normal limits, and he 
underwent triple vessel CABG (Left internal mammarian artery to LAD, aorta-first obtuse marginal artery and aorta- 
posterior descending branch of the right coronary artery 
bypasses with separate saphenous veins) with the use of 
cardiopulmonary bypass on arrested heart at 33-34°C. Cross 
clamp and cardiopulmonary bypasses were 35 minutes and 
and 47 minutes, respectively. After the operation, the patient was 
transferred to the intensive care unit and extubated there on 
the post-operative 4th hour. He was taken to the ward the 
next day and discharged on the 6th day. Blood and blood 
product usage was 1 units of erythrocyte suspension and 
2 units of fresh frozen plasma in total.

Immediately after the surgery, there was a slight increase 
in serum uric acid levels (7.4 mg/dl) detected in the blood 
drawn in the intensive care unit. As soon as the patient 
was extubated and oral intake was started, allopurinol was 
initiated at the same pre-operative dosage, and this returned 
the serum uric acid levels to normal. Following four days of 
treatment, uric acid levels returned to normal limits, and he 
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Electrocardiography which resulted positive. Myocardial 
thallium perfusion scintigraphy indicated ischemic zones 
at the inferior, inferolateral and inferoapical zones of the 
heart. According to the results, coronary angiography 
was performed and it revealed triple vessel disease with 
subtotal occlusion of left anterior descending artery (LAD) at the midportion, midportion 80% stenosis at the 
circumflex coronary artery (Cx) and 70% stenosis at the 
right coronary artery (RCA). Echocardiography was normal 
with preserved left ventricular functions (65% ejection 
fractio) and left ventricular hypertrophy. Following the 
consent of the patient, coronary artery bypass grafting 
(CABG) was planned.

During the preparatory phase for surgery, the patient 
complained of acute first toe pain. The first toe looked 
swollen, hyperemic and painful on palpation. Laboratory 
findings including complete blood count, blood lipid 
profile, renal and hepatic enzymes, clotting times, were 
normal except increased serum uric acid levels (10.74 mg/ 
dl, Normal: 3.4-7 mg/dl) and slightly elevated C-reactive 
protein (6.72 mg/L, Normal: 0-5 mg/L). He was consulted 
with internal medicine department and diagnosed as Gout arthritis. He was prescribed allopurinol 300 mg twice 
daily and scheduled for surgery when the circulating uric 
acid levels returned to normal. Following four days of 
treatment, uric acid levels returned to normal limits, and he 
underwent triple vessel CABG (Left internal mammarian 
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Gout is a kind of acute inflammatory arthritis, and 
characterized by recurrent painful attacks. In more 
than half of the patients, the metatarsophalangeal joint 
is the most commonly affected region as well as the 
presenting symptom of the patients in the clinic. The 
pathology is caused by the crystalization, accumulation 
and deposition of elevated levels of uric acid of 
monosorium urate character in the blood, at the joints, 
tendons, cartilages, and the surrounding tissues. This 
leads to painful attacks. Additionally, the disease may also 
present as tophi, kidney stones, or urate nephropathy. 
It has been shown that chronic inflammatory disorders 
such as systemic lupus erythematosus, rheumatiod 
arthritis, ankylosing spondilitis, diabetes mellitus, etc 
are associated with shorter life expectancy in affected 
individuals as compared to the general population. On the other hand, hyperuricemia is associated with 
reduced survival due to increased tendency to obesity, 
hypertension, insulin resistance, diuretic usage and renal 
Coronary artery disease is the leading cause of mortality 
and morbidity worldwide in the current decade. With 
the advances in medical knowledge about the different 
pathophysiologic events leading to ischemic heart disease, 
diagnostic methods and treatment strategies, various 
therapeutic measures are now-a-day performed to prevent, 
diagnose, treat and obtain deeper knowledge about 
the disease. It is very well known that there are certain 
risk factors such as genetic susceptibility, hypertension, 
hyperlipidemia, smoking, and diabetes mellitus, which 
may predispose an individual to coronary artery disease. 
Additionally, hyperhomocysteinemia and metabolic 
syndromes have been identified as other risk factors for 
the disease as well as predictors of the success of the 
treatment and survival of the patients. Recently, elevated 
serum uric acid level is identified as an independent risk 
factor for cardiovascular diseases. Several prospective 
studies have shown an association between hyperuricemia 
and cardiovascular diseases and death. In our case, 
the patient only had smoking as a major cardiovarcular 
risk factor, and otherwise he was not hypertensive, 
hyperlipidemic, or diabetic, and did not define positive 
family history. We may speculate that in addition to the over 
45 years of cigarettes smoking history, increased serum 
uric acid levels might have increased the risk of coronary 
artery disease or have exacerbated the symptoms of the 
patient in our case study.

DISCUSSION

It has been shown that chronic inflammatory disorders 
such as systemic lupus erythematosus, rheumatiod 
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are associated with shorter life expectancy in affected 
individuals as compared to the general population. On the other hand, hyperuricemia is associated with 
reduced survival due to increased tendency to obesity, 
hypertension, insulin resistance, diuretic usage and renal 
disease. The National Health and Nutrition Examination 
Survey I Follow-Up Study reported that serum uric 
acid was an independent predictor of cardiovascular 

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mortality in subjects above 45 years of age regardless of race, menopausal status, diuretic use, or presence of cardiovascular disease.[6] The Framingham Study showed that serum urate levels were not independently associated with the risk of coronary heart disease; however, Gout was associated with a 60% increased risk of coronary artery disease.[6] A recent study, based on the Multiple Risk Factor Intervention Trial reports that Gout may lead to up to 26% increased risk of acute myocardial infarction.[3] Choi et al.[14] in their 12 years Health Professionals Follow-Up Study, which included 51,297 male participants, strongly support the link between hyperuricemia, Gout, and cardiovascular diseases.

Although a clear mechanism indicating the consequences of hyperuricemia on cardiovascular diseases and decreased survival could not be identified, a recent novel rodent model showed that that uric acid could cause renal afferent arteriopathy and tubulointerstitial disease, which leads to hypertension.[15] When the serum uric acid levels are reversed, the renal lesions and hypertension were prevented.[9,11,14] Another explanation for the increased cardiovascular disease rate in the presence of Gout may be the ongoing and relapsing inflammation due to hyperuricemia among patients with the disease, which might enhance and promote atherogenesis and thrombogenesis, as seen in other inflammatory rheumatic disorders.[11,12]

In conclusion, patients with Gout have higher risks of cardiovascular disorders, myocardial infarction and death due to increased blood uric acid levels. As soon as hyperuricemia has been diagnosed, strict control of Gout should be aimed for, to prevent any systemic complications[12,13] as well as cardiovascular consequences. This can be achieved with a multidisciplinary approach through the usage of well known cardioprotective medications such as aspirin, statins, beta-blockers when needed, and angiotensin converting enzyme inhibitors following coronary artery bypass grafting.

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