

Coronary Artery Bypass Grafting: Simultaneous Head and Neck Mass Surgery

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Abstract

Background: Coronary artery disease (CAD) and cancer have common risk factors. According to the necessity of mass resection in patients with CAD at the same time, we decided to do neck and head mass resection and coronary artery bypass grafting (CABG) simultaneously and assess the results.

Methods: The current study was done on patients who were candidates for simultaneous head and neck mass resection and CABG. The patients' files were extracted, the information and complications were recorded in a questionnaire, and then necessary data were extracted.

Results: Totally 9 patients (3 females and 6 males) with a mean age of 69.11 ± 6.67 standard deviation years were studied. The most common site of squamous cell carcinoma in this study was tongue. Infection occurred in three patients, two of which (66.66%) died. Side effects occurred in four patients.

Conclusions: It seems that, according to the anatomical position of neck mass, proximity to the airways and large blood supply in that area, and also because of inappropriate access to the anatomical zones, the survival rate and complications in this surgical setting (simultaneous surgeries) are different from that of other studies. It seems that further studies are needed to be done with the subject of concomitant head and neck mass surgery and CABG this time with a larger number of patients.

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Introduction

Coronary artery disease (CAD) and cancer are the main causes of mortality in many parts of the world (1). CAD and cancer have common risk factors such as age, tobacco usage, and obesity (2). Other causes can be due to outcomes of chemotherapy and radiotherapy in patients who had long survival after cancer (3). These treatments have a direct side effect on the heart, which require surgical correction in some patients. Malignancy may occur in the long-term follow-up after coronary artery bypass grafting (CABG) (4). The increasing number of diagnostic facilities have helped us in the simultaneous diagnosis of both cancer and CAD (3,5). Therefore, the simultaneous treatment of these two diseases is not unusual. The incidence of cancer in some cases of CAD is reported to be 1.9-4.2% (4-8).

There are many cardiotoxic effects of

chemotherapy (3). The severity of myocardial injury depends on the type of chemotherapy and cell changes. Some types are irreversible and have permanent effects on their left ventricular ejection fraction (EF) (9). Arrhythmias, conduction deficiency, pericarditis, and other thromboembolic complications are the side effects of chemotherapy. The long mediastinal radiotherapy affects the coronary arteries and heart valves. CAD occurs over a duration of 9 years after radiation therapy, it has been increased to 63% (2,10). Tumor surgery and CABG can be performed simultaneously as one- or two-step procedure. If the two-stage procedure is selected, the recovery time must be 4-6 weeks (11,12). No study was performed exactly similar to our study; the majority of studies about CABG and cancer at the same time were associated with lung tumors, gastrointestinal (GI) or hematological malignancies.

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In 2009, another study entitled, "CABG and pulmonary resection at the same time" showed that surgical treatment in heart and lung diseases simultaneously is inconclusive. The study concludes that the procedures for heart and lung diseases can be done without the morbidity and mortality in the hospital (13). Some studies have shown that patients with hematologic malignancies frequently need to have major heart surgeries and some reports noted an increased risk of complications during surgery in these patients (14). The results of these studies suggest that cardiac surgery can be performed with acceptable mortality but with higher morbidity in patients with hematologic malignancy. Bleeding and infection are the most common side effects that usually lead to further surgery. These findings require careful selection of patients (15).

The major goal of CABG is to reduce cardiac complications during or after non-cardiac surgery (2). Another goal is to eliminate symptoms if the expected survival duration in cancer is more than 6 months (16). The last sentence was about gastric cancer but this proposition is valid also for other tumor types, which has not been studied. Most of the articles are about cancers of the lung, GI, and hematologic malignancies, and its relation to cardiac surgery, the subject of our study, is head and neck cancers, especially squamous cell carcinoma (SCC). Head and neck cancers are malignant neoplasms in the head which can occur in the regions such as the cavity of the nose, paranasal sinuses, oral cavity, salivary glands, pharynx, and larynx. Therefore, according to the necessity of mass resection in patients with CAD at the same time, we decided to do neck and head mass resection and CABG simultaneously and assess the results.

Materials and Methods

This case series study was done on patients who were candidates for simultaneous head and neck mass resection and CABG at Imam Khomeini Hospital between 2006 and 2014. Since the study was retrospective, there was no need to calculate the sample size and all the patients who had simultaneous head and neck mass resection and CABG were enrolled. The patients' files were extracted, the informations and complications were recorded in a questionnaire, and then the necessary data were extracted.

Then, the patients were followed up face to face or on the phone. Statistical analysis was performed using SPSS software (version 16, SPSS Inc., Chicago, IL, USA). Statistical t-test and chi-square test were used to analyze the data. To gain influence over the fate of a variable, regression analysis was used.

Results

9 patients (3 females and 6 males) with a mean age of

69.11 ± 6.67 standard deviation years were studied. The mean age of patients who died was 69.50 ± 5.97 years and the mean age of living patients was 68.80 ± 7.89 years ($P = 0.664$). The mean height of patients was 1.67 ± 0.05 m ($P = 0.477$). The mean weight of patients was 67.00 ± 14.11 kg and it was 72.00 ± 25.45 kg in the living patients and 64.50 ± 9.35 kg in the patients who died ($P = 0.047$).

The average body mass index was 20.11 ± 3.05 kg/m² in the living patients and 19.48 ± 2.25 in the patients who died ($P = 0.386$). Two individuals were smokers (22.22%) and others were non-smokers (77.77%). Based on our results, one of the smoker patients died 47 months after surgery. The most common site of SCC in this study was tongue (55.55%). Nose, neck, ear, and larynx had one item each (11.11%). The mean pre-operative EF was $14.79\% \pm 38.33\%$ and the mean post-operative EF was $11.70\% \pm 37.22\%$ ($P = 0.744$). Two patients in our study had undergone chemotherapy (22.22%), which has lasted for 5 sessions with therapeutic chemistry. 5 patients (55.55%) had undergone radiotherapy, with an average of 32.4 sessions. During our follow-up, 4 patients died and the average time between surgery and death was 16 months (range: 1-47 months). Seroma occurred in one patient and this case died during the follow-up period. Infection occurred in 3 patients of which 2 persons (66.66%) died in the beginning of follow-up period and one of them was admitted to coronary care unit (CCU) and this case also died during the follow-up period. Side effects occurred in 4 patients; side effects include wound secretion in the sternum, recurrence of laryngeal adductor paralysis, dysarthria, burning of the tongue, drought, and pain.

Discussion

This case series study was done to evaluate the results of simultaneous head and neck mass resection and CABG. In this study, 9 patients (3 females and 6 males) were studied. Reduced life expectancy may discourage some surgeons from necessary coronary and valvular surgery in benign neoplasms. On the other hand, there is an increasing concern about worsening of the cancer due to disorders of the immune system after CABG. Application of one- or two-staged surgery, time of heparinization, and the necessity of cardiorespiratory bypass are controversial. In Fecher et al's. study (15), it was mentioned that patients with hematologic malignancies were frequently requiring cardiac surgeries. Some reports have indicated an increased risk of complication during surgery in immunocompromised patients (11). One of the most important factors in this study was the survival of the patients after concomitant procedures were carried out. In our study, the 5-year survival rate was 55.56% and there was no in-hospital death. Whereas in the Fecher et al's. study (15), the 3-year survival rate was 83% in

patients with hematologic malignancies who had simultaneous cardiac surgery.

In Canver et al's study (13) that was done on patients with cancers (except dermatological cancers) who had a simultaneous cardiac surgery, two death occurred; one of them was because of cardiogenic shock after the combined exchange of mitral and aortic valves and another one was due to pulmonary emboli and the 3-4 year survivals reported 95%. Also, the quality of life was satisfactory after surgeries. Danton et al's study (17) that was about concomitant cardiac surgery and pulmonary resection did not show any in-hospital mortality and the 3-year survival rate was 79%. Infection was detected in three patients (33.33%). Two of the three had died. None of the patients had hematoma and one case was admitted to the CCU. Side effects occurred in four patients, three of the four patients had died. Complications in the dead patients included sternal wound drainage, recurrent lymphadenopathy and dysarthria, dysphagia, and burning tongue. Complications in survived patients included stiffness and pain in his/her tongue. It seems that, according to the anatomical position of neck mass, proximity to the airways and large blood supply in that area, and also because of inappropriate access to the anatomical zones, the survival rate and complications in this surgical setting (simultaneous surgeries) are different from that of other studies. It seems that further studies are needed to be done with the subject of concomitant head and neck mass surgery and CABG this time with a larger number of patients. More studies can lead to more accurate and generable results.

Conflict of Interests

Authors have no conflict of interests.

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