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Short Communication

Cardiac Surgery: An Overview

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ABSTRACT

Cardiac surgery is when a surgeon performs surgery on the heart or major vessels. It is frequently used to treat ischemic heart disease complications, to rectify congenital heart disease, or to treat valvular heart disease caused by numerous causes, such as atherosclerosis. Cardiovascular disease is the world's biggest cause of death. In low and middle-income nations, access to heart surgery is still severely limited, if not non-existent. Cardiac surgery differs from other types of treatment because of advancements in techniques and materials, which have resulted in safer treatments and lower perioperative risks. Despite the lower risk, postoperative treatment is linked to a number of problems, including acute renal failure, multiple organ system malfunction, neurological problems, and heart pump failure. Cardiac tamponade as a result of suture leakage, blockage of an artery graft, and paravalvular regurgitation are all common surgical consequences. After cardiopulmonary bypass, high-dose steroids reduce inflammation. Delirium is a common side effect of heart surgery, and it's linked to slower recovery and worse long-term prognosis.

Keywords: Cardiovascular disease; Rheumatic heart disease; Neurological; Complication

INTRODUCTION

The leading cause of death worldwide is Cardio Vascular Disease (CVD), accounting for over 17.5 million deaths each year, with 80% of deaths occurring in low and middle-income nations. This burden is growing as a result of the epidemiologic shift from communicable to non-communicable illnesses in low- and middle-income countries, with CVD and stroke mortality rising at an astonishing rate [1]. Despite the fact that surgery is now widely recognized as an important component of national health systems, over 5 billion people still lack timely access to safe and inexpensive surgical care when they are needed [2]. Despite the fact that the World Health Organization has forecast that heart disease would overtake cancer as the leading cause of death in poor and middle-income nations in the near future, access to cardiac surgery in these nations remains severely limited, if not non-existent [3].

Cardiac surgery, often known as cardiovascular surgery, is surgery performed on the heart or major blood vessels by cardiac surgeons. It's frequently used to treat ischemic heart disease consequences (for example, with coronary artery bypass grafting); to rectify congenital heart disease; or to treat valvular heart disease caused by a variety of conditions, such as endocarditis, rheumatic heart disease, and atherosclerosis. It also includes heart transplantation. An example of coronary artery bypass surgery is shown in Figure 1.

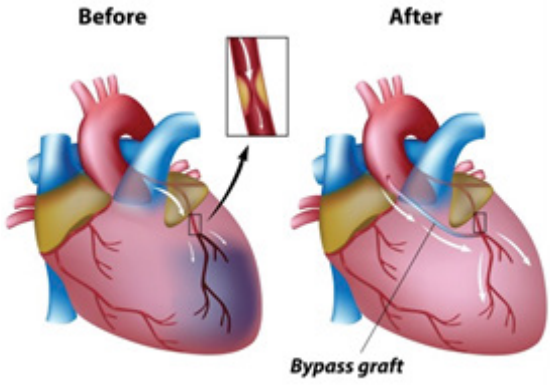

Figure 1: Coronary artery bypass surgery.

Following WWII, cardiac surgery evolved around two key goals: correcting congenital heart abnormalities and restoring the function of heart valves afflicted by Rheumatic Heart Disease (RHD). The increased prosperity in developed countries led to the near abolition of RHD and the introduction of degenerative and lifestyle disorders as main grounds for open heart surgery as the discipline became an integral component of medicine [3]. Cardiac surgery differs from other types of treatment because of advancements in techniques and materials, which have resulted in safer treatments and lower perioperative risks. Despite these advancements, postoperative complications are common and are a

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factor in hospital stay length and functional recovery [4]. In a study of 204 patients undergoing cardiac surgery, Soares et al. (2011) found that 58% suffered postoperative problems, the majority of which were pulmonary (31%), cardiac (15.8%), and neurological (15.8%), (13.9%) [4]. Long-term bed rest is a well-known cause of postoperative problems.

COMPLICATION

Postoperative problems involving the cardiovascular and respiratory systems, as well as the kidneys and central nervous system, are common after cardiac surgery. Acute Renal Failure (ARF) is still a common and dangerous side effect after heart surgery. The incidence of ARF after cardiac surgery has been estimated to be between 1% and 30%. Renal failure that develops after heart surgery and is severe enough to necessitate hemodialysis is linked to an increased risk of death, hospital stay, and cost [5]. After surgery, bed rest causes many organ systems to malfunction. Immobility reduces oxygen transfer, including lung and tissue oxygenation, raises the risk of deep vein thrombosis and pulmonary thromboembolism, and causes muscle mass and strength loss. Despite its negative consequences, bed rest is recommended after surgery. Mobility restriction has been recommended for individuals undergoing cardiac surgery to reduce cardiac overload [6].

After heart surgery, neurological complications are a major source of concern, and it is unclear which perioperative factors are to blame for this negative outcome. Neurological symptoms and unfavourable cognitive outcomes are becoming more common as surgical techniques get more complicated and the population ages [7]. The average age of patients undergoing heart surgery has risen from 64 in 2001 to 67 in 2010. Prior to surgery, the number of patients with neurological disorders substantially increased, from 1.4 percent in 2001 to 2.8 percent in 2010. Cardiac surgical techniques have also become more complicated, with the number of patients receiving isolated Coronary Artery Bypass Graft (CABG) surgeries falling by about 20% from 2001 to 2010. Despite greater patient risk profiles, fatality rates have decreased marginally, from 4.0% in 2001/2002 to 3.1% in 2010/2011 [8].

Apart from issues directly connected to the surgical method, such as cardiac tamponade due to suture leakage, blockage of an artery graft, or paravalvular regurgitation, heart pump failure is one of the most common and serious complications that can arise shortly after cardiac surgery [9]. Most patients have varying degrees of myocardial function depression, but heart failure develops in around 20% of patients in the postoperative period, leads to early mortality, and is caused by various factors: increased ventricular after-load, insufficient ventricular preload, and ineffective ventricular contraction [10].

STEROIDS IN CARDIAC SURGERY

After cardiopulmonary bypass, high-dose steroids reduce inflammation. Delirium is a common side effect of heart surgery, and it's linked to slower recovery and worse long-term prognosis [11]. Dexmedetomidine is a sedative and pain reliever that reduces anxiety. It is notable for its capacity to deliver drowsiness without the risk of respiratory depression, as well as its capacity to provide cooperative or non-compliant sedation. Dexmedetomidine has been recommended as a therapy for the unfavorable cardiovascular effects of heart surgery in several trials. However, because of its common adverse effects, such as hypotension and bradycardia, and higher economic expenditures, this medication's use in clinical practice has been limited [12]. High-dose methylprednisolone given intraoperatively before cardiopulmonary bypass did not improve postoperative recovery quality or reduce the incidence of delirium [11].

REFRENCES

1. Vervoort D, Meuris B, Meyns B, Verbrugghe P. Global cardiac surgery: access to cardiac surgical care around the world. J Thoracic Cardiovasc Surg. 2020;159: 987-996.
2. Meara JG, Leather AJ, Hagander L, Alkire BC, Alonso N, Ameh EA et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet. 2015;386: 569-624.
3. Zilla P, Yacoub M, Zühlke L, Beyersdorf F, Sliwa K, Khubulava G, et al. Global unmet needs in cardiac surgery. Global Heart. 2018;13:293-303.
4. Soares GM, Ferreira DC, Gonçalves MP, Alves TD, David FL, Henriques KD et al. Prevalence of major postoperative complications in cardiac surgery. Rev Bras Cardiol. 2011;24:139-146.
5. Conlon PJ, Stafford Smith M, White WD, Newman MF, King S, Winn MP et al. Acute renal failure following cardiac surgery. Nephrology, dialysis, transplantation: Official Publication of the European Dialysis and Transplant Association-Eur Renal Assoc. 1999;14:1158-1162.
6. Santos PM, Ricci NA, Suster ÉA, Paisani DM, Chiavegato LD. Effects of early mobilisation in patients after cardiac surgery: a systematic review. Physiotherap. 2017;103:1-2.
7. Selnes OA, McKhann GM, Borowicz LM, Grega MA. Cognitive and neurobehavioral dysfunction after cardiac bypass procedures. Neurol Clin. 2006;24: 133-145.
8. Patel N, Minhas JS, Chung EM. Risk factors associated with cognitive decline after cardiac surgery: a systematic review. Cardiovasc Psych Neurol. 2015.
9. Soares GM, Ferreira DC, Gonçalves MP, Alves TD, David FL, Henriques KD, et al. Prevalence of major postoperative complications in cardiac surgery. Rev Bras Cardiol. 2011;24:139-146.
10. Ball L, Costantino F, Pelosi P. Postoperative complications of patients undergoing cardiac surgery. Curr Opion Crit Care. 2016;22:386-92
11. Royse CF, Saager L, Whitlock R, Ou Young J, Royse A, Vincent J, et al. Impact of methylprednisolone on postoperative quality of recovery and delirium in the steroids in cardiac surgery trial: a randomized, double-blind, placebo-controlled substudy. Anesthesiol. 2017;26: 223-233.
12. Wang G, Niu J, Li Z, Lv H, Cai H. The efficacy and safety of dexmedetomidine in cardiac surgery patients: A systematic review and meta-analysis. PLoS One. 2018;13(9):e0202620.