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Coronary Artery Bypass Grafting (CABG): An Alternative

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The development of the heart-lung machine ushered in the era of modern cardiac surgery. Coronary artery bypass graft surgery (CABG) remains the most common operation performed by cardiac surgeons today. From its infancy in the 1950s till today, CABG has undergone many developments both technically and clinically [1].

Coronary artery bypass grafting (CABG) is a type of surgery called revascularization, used to improve blood flow to the heart in people with severe coronary artery disease (CAD).CABG is one treatment for CAD. During CABG, a healthy artery or vein from another part of the body is connected or grafted to the blocked coronary artery. The grafted artery or vein bypasses the blocked portion of the coronary artery. This new passage routes oxygen-rich blood around the blockage to the heart muscle. As many as four major blocked coronary arteries can be bypassed during one surgery.

The other names for CABG are Bypass surgery, Coronary artery bypass surgery, Heart bypass surgery. Coronary artery bypass grafting (CABG) is used for treating people who have severe coronary artery disease (CAD) which leads to severe heart attack.

Procedure

A coronary artery bypass graft involves taking a blood vessel from another part of the body (generally the chest, leg or arm) and attaching it to the coronary artery above and below the narrowed area or blockage. This new blood vessel is termed as a graft. The number of grafts needed will depend on how severe your coronary heart disease is and how many of the coronary blood vessels are narrowed. A coronary artery bypass graft is carried out under general anaesthetic, which means you'll be unconscious during the operation. It usually takes between 3 and 6 hours.

Risks followed by CABG include bleeding, stroke, wound infection, graft failure, renal failure, postoperative atrial fibrillation and death. The stroke rate of CABG has been reported at 1% to 2% depending on the characteristics of the patient and their risk factors for stroke including advanced age, prior stroke, aortic atherosclerosis, peripheral arterial disease, perioperative atrial fibrillation, and diabetes [2,3] .

Types of CABGs

Arfterial grafts

Internal thoracic arteries are the most common bypass grafts used. They are the standard of care, and the goal is to use these arteries for every patient who has isolated coronary artery bypass surgery. The ITAs result in the best long-term results. There are two internal thoracic arteries in chest. If these arteries are used for bypass surgery, they can usually be kept intact at their origin because they have their own oxygen-rich blood supply. The other end is cut and sewn to the coronary artery below the site of the blockage. If the artery needs to be completely removed, it is called a “free” artery.

The radial (arm) artery is another common type of arterial graft. There are two arteries in the arm, the ulnar and radial arteries. The ulnar artery delivers blood to the arm, so most people do not have any side effects if the radial artery is used as a graft. If your surgeon uses radial artery, tests are done before and during surgery to ensure the best option. If the radial artery is used as the graft, then there is a need to take a calcium channel blocker medication for several months after surgery. This medication helps keep the artery open. Some people who have radial artery bypass grafts have numbness in the wrist after surgery. But, this sensation usually goes away. This type of graft is known to have good results, although long-term outcomes are not fully known. Less commonly used arteries are the gastroepiploic artery, which is a branch leading to the stomach, and the inferior epigastric artery, which leads to the abdominal wall. These arteries are more difficult to use, but can be a good option if other arteries cannot be used.

Vein grafts

Saphenous veins are veins in your legs that can be used as bypass grafts. Minimally invasive saphenous vein removal does not require a long incision. Instead, 1-2 incisions are made at the knee and a small incision is made at the groin. This type of removal leads to less scarring and a faster recovery than traditional surgery. Although much has been done to improve the results with vein grafts, they still tend to fail in the long term.

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