Coronary Artery Bypass Grafting (CABG)

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Our Patient

• 63 year old woman.

• Frequent episodes of severe “squeezing” pain in her chest.

• On walking short distances or climbing more than half a flight of stairs.

• Recently getting episodes of pain while sitting down or lying in bed.

• Medical history of ...
  ▪ Hypertension (high blood pressure)
  ▪ Hyperlipidemia (elevated levels of cholesterol and fat in the blood stream)
  ▪ Diabetes mellitus (high blood sugar)

• Never smoked, and eats healthy.
Medical Work-up

• Electrocardiogram (EKG) is unremarkable.

• Blood sugar and cholesterol not very well controlled. Blood pressure is higher than it should be.

• Sent to an imaging specialist.

• Echocardiogram shows that her ejection fraction is low (pump function of the heart is reduced).

• CT (computed tomography) of her heart vessels (coronary arteries) shows extensive blockages.
Looking at the Coronary Arteries

CT Coronary Angiography

Invasive Coronary Angiography

Achenbach et al. Heart, 2010
What to do next?

Medical management

Percutaneous coronary interventions (with stents)

Bypass surgery
What is Bypass Surgery?

• Coronary Artery Bypass Grafting (CABG), Bypass Surgery, “Open Heart” Surgery

• This is a surgical procedure, whereby the surgeon uses segments of blood vessels from other parts of the body (called *grafts*) to *divert blood flow (or bypass)* from the aorta to below the blockage.

• The graft can be a vessel arising from the aorta, that normally supplies the chest wall, that gets re-routed to a blocked coronary (internal mammillary artery graft).

• Alternatively, it can be a vein harvested from the leg (vein graft), with one end connected to the aorta and the other end attached below the blockage.
Internal Mammary Artery Grafts

Saphenous Vein Grafts
Radial Artery Grafts

The surgery: extracorporeal bypass, the heart-lung machine and cardioplegia
The surgery: deploying the grafts
The surgery: advances

Minimally-invasive

Cleveland Clinic Foundation

Robotic-assisted

Mayo Clinic

Off-pump

AMERICAN COLLEGE of CARDIOLOGY
Life after surgery

- In the first few days after surgery, our patient felt worse.

- But then she felt better, was discharged from the hospital and in 2 months, she had fully recovered.

- She took her heart medications consistently.

- She inducted herself in cardiac rehabilitation.

- She exercised regularly, dieted and lost weight.

- She no longer had chest pain, and felt that her energy levels had increased.