Bypass Grafts in Vascular Patients

This is a general guide to scars that correspond with bypass grafts. Often the approach used by the vascular surgeons is determined by the patient's individual factors and the surgeon's preference.

The aim of a bypass graft is to relieve symptoms of intermittent claudication.

**There are two types of vascular grafts:**

- **Synthetic grafts**, often made of Dacron or PTFE. Synthetic grafts are usually used above the inguinal ligament as results are better. However, they can be used more distally if an autologous/biological graft is not available. 33-50% are still patent at 5 years post operatively. Studies have shown that aspirin can increase the longevity and patency of synthetic grafts.¹

- **Autologous/biological grafts**, are usually made of the patients' own long saphenous vein, but other veins can be used. A vein graft can be inserted un-reversed with the valves removed or reversed. 66% are still patent at 5 years post operatively. Warfarin may be used long term in these patients.¹

To tell whether a synthetic or biological graft has been used, look for a scar from the groin to ankle in the long saphenous vein distribution. If there is one, it's likely to be a biological graft. If there isn't one, it's likely to be a synthetic graft. However, remember long saphenous vein grafts can be used in coronary artery bypass grafting as well so it may be dangerous to jump to conclusions!

**Grafts can also be classified as anatomical or extra anatomical.**
Anatomical – aorto-bifemoral bypass
Extra anatomical – axillofemoral, femoral-femoral bypass

Long saphenous vein scar
Access scars:

Access to aorta
Laparotomy

Rooftop

Oblique scar – usually used for access to the iliac arteries

Access to femorals
Vertical groin scars – horizontal scars in the groin crease are also sometimes used, but more commonly used in endovascular aortic surgery
**Bypass scars:**
You should be able to palpate a thrill over the bypass graft. Doppler signals should be audible throughout the graft.

**Bypass grafts for aortoiliac stenosis**

Axillo-femoral bypass

Axillo-bifemoral bypass (if both iliac arteries are diseased or aorta cannot be clamped due to comorbidities)
Bypass grafts for common iliac artery stenosis

Aorto-bifemoral bypass graft (has a retroperitoneal approach)

External Iliac or proximal femoral artery disease

Ileo-femoral bypass
Femoral-femoral bypass (most use synthetic grafts)

NB Also: aortobifemoral bypass and axillofemoral bypass (shown above)

**Femoral artery disease = Infra-inguinal bypass**  
**Tibial, peroneal or pedal artery disease = Infra-popliteal bypass**

This scar can correlate with an Infra-inguinal or Infra-popliteal bypass. Infra-inguinal bypasses treat femoral artery stenosis and include femoral to above knee popliteal and femoral to below knee popliteal bypass grafts. Infra-popliteal bypasses treat stenosis in the more distal arteries in the leg.

It is difficult to distinguish between synthetic or autologous graft in these bypass grafts, as the scar is often the same to access the artery and vein. This can be further complicated by the possibility of fasciotomy scars on calves (both medial and lateral). Compartment syndrome is a common complication following revascularisation of limb.

**Assessing the graft**  
To investigate success of the bypass graft operation, perform a peripheral arterial examination and specifically examine:

- Peripheral pulses (remember when examining pedal pulses to palpate both legs simultaneously to compare each side)
- Examine for pulses over scars – graft pulsations
- For any new peripheral arterial ulcers or scars from healed ulcers
- Colour changes of the extremities (red, white, blue/purple)
- Venous filling time (how long it takes for foot to become pink after performing Buerger’s test, >30 seconds is severe ischaemia)
- ABPI (remember can be falsely high in diabetic patients with calcified arteries, and patients with chronic renal failure)
- Offer to perform a doppler examination of pulses and grafts of pulses not easily palpable
Reference

Important Note
These notes were written by Dr Khan and Dr Hodgkinson in September 2013. They are presented in good faith and every effort has been taken to ensure their accuracy. Nevertheless, medical practice changes over time and it is always important to check the information with your clinical teachers and with other reliable sources. Disclaimer: no responsibility can be taken by either the author or publisher for any loss, damage or injury occasioned to any person acting or refraining from action as a result of this information.

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