NHS
Royal Devon and Exeter
NHS Foundation Trust

Vascular Access for Haemodialysis Patients

Introduction

Haemodialysis treatment using a dialysis (kidney) machine requires regular access to the bloodstream, usually 3 times a week. Although the veins in your arms are visible, the blood flow through them is too slow for dialysis. The flow in your arteries is better but they cannot be repeatedly used for dialysis. You will therefore need to have a fistula constructed or a graft inserted.

A fistula is formed when your own vein is joined to an artery. This increases the flow in the vein and over time the vein gets bigger (matures) and can be used for dialysis. A fistula will normally take six to eight weeks to mature.

A graft is used when you have no suitable vein. This involves the insertion of a plastic tube between your artery and vein which can then be used for dialysis. Some grafts can be used immediately after surgery and some can be used after a couple of weeks.

Of the two options, a fistula provides the best long-term vascular access with the fewest complications.

You may be dialysing, or know people who dialyses, using a line (haemodialysis catheter). This is a plastic tube inserted through the skin into the neck or groin veins and is often only appropriate in an emergency when you need to dialyse quickly. For most people this should be used as a temporary measure because:

- There is a risk of infection passing through the skin into the circulation via the line. This can be very serious.
- There is risk of damage to the veins which could make future fistula creation or graft insertion difficult.

You will be given an 'Emergency Bleed Pack' to accompany this information leaflet. Do not worry. This is a safeguard just in case your fistula starts to bleed at home. Your dialysis nurse will show you how to use this. You'll find some more information on what to do on page 9.

Care of arms before surgery

If you have been told that you will, or may in the future, need a fistula or graft you should not have blood taken from the veins in your arms. Blood samples can be taken from the veins in the back of your hands. If you ever need a drip or IV infusion then you should tell the doctor or nurse that you need your arm veins for dialysis and also ask them to use your hands.

What is a fistula?

A fistula is formed when a vein is joined to an artery - this involves an operation. Where possible it is performed in your non-dominant arm. It is usually done as a day case under local anaesthetic and takes about 1 hour. You will be asked to give written consent for this operation. As your arm may feel a little uncomfortable, you will need a relative or friend to collect you. If you require hospital transport, please inform the staff.

The 2 most common type of fistulae are:

1. Radiocephalic fistula

The vein at the wrist just above your thumb (cephalic vein) is joined to your radial artery which is just inside your wrist. This causes the cephalic vein, which runs up your forearm, to enlarge.

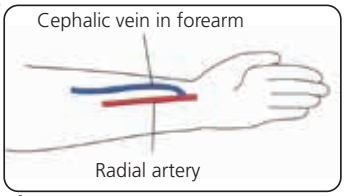

Diagram 1

2. Brachiocephalic fistula

This fistula is made at the elbow in the inside crease. It is also made using the cephalic vein but this time it is joined to the brachial artery.
The vein in your upper arm then enlarges.

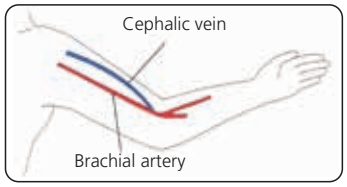

Diagram 2

What is a graft?

If fistula formation is not possible then you may need a graft. This also requires an operation but instead of using vein, a plastic tube is inserted between an artery and vein under the skin. This is possible in a number of places in the arms and legs. It usually requires a general anaesthetic and takes over 1 hour. You might need to stay in hospital overnight.

If you need a general anaesthetic you will be asked not to eat or drink for approximately 6 hours before the operation. This will be discussed at your pre-assessment appointment. You will also be advised what to do with your usual tablets.

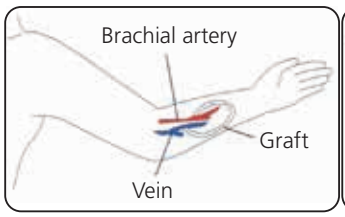

Diagram 3

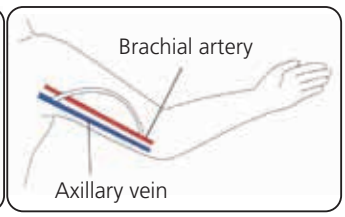

Diagram 4

How do I know if my fistula/graft is working?

Ask your nurse to show you how to check your fistula. Remember it is your lifeline and you must know how to look after it when you are at home.

- Thrill – this is a vibrational feeling when you place your fingers on the skin over your fistula.
- Bruit – this is the 'swoosh-swoosh' noise your fistula makes when you listen to it through a stethoscope
- You may not be able to feel a thrill if you have a graft but a bruit should be present.

Get use to feeling the buzzing 'thrill' of your fistula each morning and evening. If it becomes difficult to feel the fistula it may have become blocked in which case you need to contact the kidney unit – **01392 404791/4792 or 01392 402590 out of hours**.

How is your fistula/graft used?

At each dialysis session 2 needles will be inserted into your fistula or graft. Some patients like to learn how to do this for themselves. These needles will be connected to tubing which runs through the dialysis machine. The lower 'arterial' needle takes blood from the fistula/graft to the dialysis machine. Blood is pumped through the machine and cleaned so that waste products and excess fluid can be removed. Blood then returns to your body through the higher 'venous' needle.

Complications of fistula/graft formation

Early failure

A small number of fistulae/grafts may not work. This is more likely if the vein or artery is small or diseased or if your blood pressure is low.

Swelling and pain

This usually settles down after a few days and painkillers can be taken if necessary. Rarely, a fistula can continue to swell over months or years. This may require further surgery.

Bleeding

Occasionally the wound may ooze blood following your operation. Generally this stops after a short period of time.

Seroma

Sometimes a fluid collection can occur around the operation site. This normally resolves without treatment.

Failure to mature

Some fistulae do not develop properly. If this is the case it may be possible to fix this with another procedure or operation.

Steal Syndrome

Sometimes fistulae or grafts work too well and 'steal' blood away from the hand causing colour change, tingling or numbness. A further operation might be required if you have these problems.

Infection

Rarely, fistulae or grafts can become infected. Persistent swelling, pain, heat and redness are signs of infection and you need to report this immediately as you may need antibiotics.

Clotting

A clot can build up and block your fistula/graft. This can sometimes be fixed with an operation if it is noticed quickly. It is important to contact the dialysis unit immediately if you lose the thrill or bruit in your fistula.

Enlarged veins in the arms and chest

If narrowings develop in the veins above you fistula or graft this can cause other veins to become more prominent or your arm to swell. This can often be treated with a procedure to stretch the vein.

Problems with the heart

This is rare but can occur if the fistula or graft has a high volume of blood passing though it back to the heart. If you get problems with your breathing, a rapid heartbeat or dizzy spells please inform your nurse or doctor. This may require further surgery.

Care of your newly constructed fistula/graft

For the first 3 days we ask you to wear a loose padded bandage over the operation site. This is just to remind you to take extra care with the arm.

A simple absorbent gauze dressing will cover the operation site for the first 10 days whilst the wound heals. Please do not get this dressing wet.

If you have visible stitches then they will need to be removed 10-14 days after the operation, either by your dialysis nurse, homecare nurse or at your GP practice. Please ensure you are aware of who will be doing this before you leave the hospital. Sometimes transparent waterproof glue is used to close the wound and you will not have stitches to remove or a dressing.

You may experience some pain initially, which usually responds to simple pain relief e.g. paracetamol.

You need to look after your new fistula /graft since it is your means to trouble free haemodialysis.

Keeping Your Fistula Working

You play an important part in keeping your fistula/graft healthy because many non-renal staff will not be trained to care for them.

You should make all carers aware of the following:

- Do not take blood pressure measurements on the fistula/graft arm.
- Do not allow any blood tests to be taken from your fistula/graft arm.
- No needles for infusions or drips in the fistula/graft arm.
- Do not wear tight restrictive clothing, watches or bracelets on the fistula/graft arm.
- If you require a vascular catheter (neckline) tell the doctor which arm the fistula/graft is in and ask them to avoid that side if possible.
- Wash your fistula/graft daily with soap and water and pat dry.
- Wash your fistula/graft on arrival at the dialysis unit with soap and water and pat dry.
- Avoid sleeping on your fistula arm.
- Do not use sharp objects near your fistula e.g.Razors.
- Avoid carrying heavy loads of shopping with the fistula arm for 2 weeks after the operation.
- Do not remove scabs from needle sites as this can start bleeding or introduce infection.

- Avoid becoming dehydrated as this thickens and slows the blood flow and can clot the fistula/graft (you should however stay within your advised fluid restriction).
- Check that your fingers (or toes if you have a fistula or graft in your leg) remain warm and pink if they do not then contact the renal unit.

Ask your dialysis nurse to check the 'thrill' prior to each dialysis treatment.

Not all fistula/graft operations are successful the first time. Another attempt at a different site may be necessary.

Development of your newly constructed fistula (this does not apply to grafts)

After the stitches are removed you will need to develop your fistula to make the vein grow larger. To do this you will need a hand exerciser either in the form of a 'squeeze ball' or a rolled up pair of socks will do; you are advised to squeeze the hand exerciser 10 times, 10 times a day with your fistula hand. This will make it easier for your nurse to insert the needles needed to provide haemodialysis treatment.

Problems that can occur once haemodialysis has commenced

- **Bruising**

  Until the fistula is established it is possible for blood to leak into the surrounding tissues when the needle is inserted. This is fairly common and usually a simple ice pack helps to alleviate the symptoms

- **Bleeding**

  If your fistula/graft starts to bleed after you have had your dialysis and you have left the dialysis unit, apply pressure at the bleeding site with your hand (you may find using a clean towel or gauze pad may help but make sure the pressure is applied directly over the bleeding site). Call your dialysis unit immediately to let them know and seek further advice.

  Do not scratch or pick the scab from your needle site as this can start bleeding or introduce infection.

  Very rarely, a fistula/graft can 'burst' at home causing severe bleeding. If this happens follow the steps below:

  Step-by-step guide on using a tourniquet for a severely bleeding fistula/graft.

  - If you are a carer – apply gloves (in pack)
  - Apply pressure over bleeding site (using gauze swabs or towel)

  Apply the tourniquet tightly several inches above the bleeding site

  - Elevate the arm above the level of the heart if possible
  - Call 999 for an ambulance

- **Infection**

  Red, painful or discharging areas may appear at the site where the needles were inserted. Let the kidney unit know at once.

  If you require further help or advice please contact the kidney unit on **01392 404791/4792 or 402590.**

Finally…

We hope that you have found this information leaflet helpful. Please remember that you are free to ask the surgeon as many questions as you would like. You should be satisfied that you have received enough information about the procedure before you sign the consent form.