FORMATION OF AN AV (Arterio-Venous) FISTULA

Information for patients

This information sheet has been provided to help answer some of the questions you may have about FORMATION OF AN AV (arterio-venous) FISTULA.

Why is this surgery necessary?

Patients with chronic kidney failure need to have their kidney function replaced artificially. This can be done in a number of ways, including transplantation, peritoneal dialysis or haemodialysis.

For **haemodialysis**, blood needs to be removed from the body and passed through an artificial kidney, where it is 'cleaned' before being returned to the body. For this to work effectively, the blood needs to be removed from the body at a reasonable speed.

Unfortunately, the blood vessels in the arm (normally used to obtain blood when you have a blood test) do not provide sufficient flow to allow blood to be taken at this speed. Therefore, other methods have to be used for regular haemodialysis. One of these is 'central venous access', which involves the insertion of a tube (catheter) into large vein, allowing blood to be taken quite quickly from the circulation at regular intervals. However, there are problems associated with this, including the risk of infection.

A much more satisfactory way of obtaining blood from the circulation for haemodialysis is to form an **AV** (arterio-venous) **fistula**.

How is an AV fistula formed?

AV fistulae are formed by joining a vein to an artery, usually in the arm or sometimes in the leg. By doing this, the blood in the artery flows under high pressure directly into the vein, without going through the smaller blood vessels that normally separate it from a vein. To accommodate the increased amount of blood flowing through it, the vein grows larger and the wall of the vein gets thicker.

These larger, thick-walled veins make it easy to insert dialysis needles on a regular basis and allow blood to be removed from the body at a speed adequate for haemodialysis. The veins may appear over the back of the arm and whilst in some cases, they can grow to be quite large, in many patients they remain reasonably small and discreet.

We will first need to check that the blood vessels in your arms are suitable for the formation of an AV fistula. These tests usually require an ultrasound scan, but you may also need to have an x-ray in which a special dye is used to highlight your veins. You will be given more information about this as necessary.

In some people, the blood vessels (veins) in the forearm are not big enough to allow for the formation of an AV fistula. Also, the veins in the forearms of some people may have been damaged by previous attempts to take blood, or by the insertion of small cannulae as part of their medical treatment. This is why all kidney patients are advised whenever possible, to inform all medical staff of the importance of protecting the blood vessels in their forearms.

If the veins in your forearm are found to be unsuitable, the surgeon may consider forming an AV fistula at the elbow, or in some cases, by using ‘artificial’ veins. These veins can be taken from your lower leg or may be made from an artificial material. The operation is usually carried out under a local anaesthetic, but surgery to the elbow or leg may be done whilst you sleep under a general anaesthetic.

What are the risks associated with AV fistula formation?

As with any operation, there are risks associated with having a general anaesthetic. However, AV fistula formation is generally a very safe operation. Specific to this operation are the following;

The most common complication is that the surgery fails. Approximately 20 – 30% of AV fistulae will clot (block) within the first 24 hours after the operation. Another 20 – 30% will either clot or fail to develop suitably to be used for haemodialysis. If this happens, you may need a second operation or procedure carried out under x-ray guidance to re-establish the AV fistula.

Although there may be some oozing of blood from the site of the wound, significant bleeding occurs in less than 1% of patients.

There is a less than 5% risk of wound infection, which requires treatment with antibiotics.

Very rarely (in approximately 1% of patients), the fistula will be so successful that too much blood gets diverted away from your hand and you may notice it becoming colder and occasionally uncomfortable. In this situation, a second operation will be required to reduce the size of the connection between the artery and vein of the AV fistula.

Other complications that may occur include the feeling of ‘pins and needles’ (tingling) in some of the fingers of the hand during the first few weeks after surgery. This is occurs in approximately 20% of patients. It is caused by bruising of the nerve supply to the hand and is usually only a temporary problem which resolves on its own over a period of weeks.

Is there anything I need to do to prepare for my operation?

You will probably be admitted to hospital on the day of surgery. Please bring your nightwear, dressing gown, slippers and toiletries with you when you come into hospital. Please do not bring cosmetics, jewellery or other valuables (including mobile phones).

You **may** be asked not to have anything to eat or drink from midnight the night before your operation.

You can take all your medications as usual, **except blood-thinning tablets**. If you take blood-thinning medications (such as Warfarin, Aspirin or Plavix) and/ or you are allergic to any medications, please let your doctor or the ward staff know before you have your operation.

What will happen during my admission to hospital?

Before the operation, we will assess your fitness for anaesthetic, as well as check that your blood pressure is not too low. If this is the case, the operation may fail and so your blood pressure medication may be reduced for the first few weeks after the formation of your AV fistula.

Both the surgeon and the anaesthetist will visit you, explain what they plan to do and ask you to sign a consent form, which gives the surgeon your permission to do the operation. You will then be asked to change into a hospital gown before you go to the operating theatre.

Wherever possible, the surgeon will use your non-dominant arm for the procedure. This means that if you are right-handed, s/he will use your left arm and if you are left-handed,s/he will use your right arm. However, this is not always possible if the blood vessels in your non-dominant arm are not suitable for AV fistula formation.

The procedure in the forearm usually takes approximately 1 –2 hrs to complete, but surgery to the elbow or leg may take longer. You will have a scar, which is usually no more than 2 inches (5cm) in length, although larger scars may result from surgery to the elbow or from the insertion of an artificial vein (graft).

What happens after my operation?

If you had a **general anaesthetic**, you will wake up in the recovery room before you are taken back to the ward. If you had a **local anaesthetic**, we will take you straight back to the ward after your operation.

Please tell us if you are in pain or feel sick. We have tablets/ injections that we can give you as and when required, so that you remain comfortable and pain free.

On the ward, the nurses will measure your blood pressure regularly and protect your wound with a large towel to keep it warm. They will also check frequently that blood is flowing correctly in the blood vessel by listening with a stethoscope to the area over the site of the operation.

The Nurse will show you how to feel for the 'thrill' or vibration to confirm that the fistula is continuously working. You should always be able to feel this thrill, which is the blood rushing through your fistula. You will feel the thrill when you place your hand next to the incision. If you do not feel this thrill, you must contact the Dialysis Unit or Accident and Emergency immediately.

When can I go home?

Patients are usually able to go home on the same day as their operation. This however depends on how well you are. Before you leave, the nurses will advise you on taking care of your wound and whether you need to return to hospital for any stitches to be removed.

Is there anything I need to watch out for at home?

Please contact your Dialysis Nurse, Kidney Doctor, or Accident and Emergency **as soon as possible** if any of the following occur;

Your stitches come apart.

Your bandage becomes soaked with blood.

A bulging in your access that previously wasn't there.

your wound becomes red or painful, as you may have an infection.

you notice your hand feeling colder and uncomfortable, as too much blood may be getting diverted from your hand.

Please come to hospital **immediately** if there is a reduction in the 'thrill' or vibration you feel when putting your hand over your scar, as this is a sign that your fistula is not working properly. You may need to have a second operation or a procedure done under x-ray guidance to re-establish the fistula.

It is very important to make sure that no-one attempts to take blood or measure your blood pressure from your fistula arm. Both of these could damage or clot the fistula.

When can I get back to normal?

You should take 2 or 3 days off **work** and **avoid** heavy lifting or carrying for the next 2 - 3 weeks. Avoid heavy **exercise** and playing **sport** for 2 - 3 weeks after your operation. You should be able to **drive** again 2 weeks after surgery.

When can the nurses use my AV fistula?

It usually take a minimum of 6 – 8 weeks for the fistula to reach a size suitable for dialysis. Some may take longer. You may be advised to do some hand exercises to encourage the growth of blood vessels in your forearm.

When first used, the walls of many fistulae are often soft and mobile and so inserting the needle for the first few haemodialysis sessions may be difficult and bleeding can occasionally occur at the site of the puncture. This is not an unusual complication and whilst the bruising may look alarming, it usually settles down within a few days or weeks. The nurse is then able to make a further attempt at inserting the needle. Over time, the vessel will become more fixed in position and the vessel wall will thicken, meaning few or no further problems when the needle is inserted.

If you have any queries or concerns, please do not hesitate to contact your dialysis nurse or the Accident and Emergency department.

How do I contact if there is a problem?

Princess Margaret Hospital

242-322-2861 Ext. 2180 or (242) 502-7428