Fenestrated and branched endograft repair of aortic aneurysm

This leaflet is to help answer some of the questions you may have about having a fenestrated or branched endograft. It explains the benefits, risks and alternatives of the procedure as well as what you can expect when you come to hospital.

If you have any questions or concerns, please do not hesitate to speak to a doctor or nurse caring for you.

What is an aneurysm?
Arteries carry blood away from your heart to the rest of your body. An aneurysm occurs when the artery walls weaken.

When blood flows through the aorta (the main blood vessel in the stomach), the pressure of the blood beats against the weakened walls and makes them bulge like a balloon, forming an aneurysm. This type of aneurysm is called an abdominal aortic aneurysm.

If the ‘balloon’ grows large enough, there is a danger that it will rupture (burst). We treat aneurysms to prevent them from rupturing.

Once an abdominal aortic aneurysm has ruptured the chances of survival are low, with 80 to 90 percent of all ruptured aneurysms resulting in death. These deaths can be avoided if an aneurysm is detected and treated before it ruptures.

What is an endovascular aneurysm repair (EVAR)?
EVAR (endovascular aneurysm repair) is a minimally invasive ‘keyhole’ surgery to repair an aneurysm. It is performed through a small hole in your groin, rather than the large incision across your abdomen used in traditional surgery. It is performed in the radiology (x-ray) department by an interventional radiologist (a doctor who uses x-ray to diagnose illnesses and is trained to perform minimally invasive procedures to treat them) and a vascular surgeon.

With EVAR, the aneurysm is repaired using a special stent graft (also known as an endograft). It is a small, fabric wrapped, flexible mesh tube used to ‘patch’ the ballooned section of blood vessel by fitting it inside the artery, to strengthen it and prevent bursting.

What is a fenestrated or branched repair?
The choice of whether a fenestrated or branched device is used for the repair will be made based on your aneurysm. The decision will be made following careful review of your CT scan (computerised tomography – a special kind of x-ray) and discussion at a multi-disciplinary team meeting involving the health care professionals looking after you.
**Fenestrated repair**
When your aneurysm happens below your renal arteries (that take blood to your kidneys) but there is not enough 'normal' aorta (or neck) below the renal arteries, it is impossible to get an adequate seal when the device is placed. By constructing a device with fenestrations (or holes) for the renal arteries and even the mesenteric arteries (that take blood to your intestines), the sealing zone can be higher into the 'normal' aorta ensuring that a seal is achieved when the device is placed.

**Branched repair (also called four branches)**
When your aneurysm extends across the segment of aorta where the renal and/or mesenteric arteries arise, a branched device will be constructed. This device serves the primary function of treating your aneurysm whilst maintaining flow to your renal and/or mesenteric arteries and provides adequate support for the modular components that make up the device. These grafts are custom built and on average take six weeks to build.

**What happens during the procedure?**
The procedure is performed by an interventional radiologist and a vascular surgeon, using x-rays to guide medical instruments inside your arteries.

In the procedure room you will be asked to lie on your back on an x-ray table. Monitoring equipment will be attached to you to measure your blood pressure and heart rate. A small tube (cannula) will be put into a vein in your arm for monitoring and to give you fluids.

You will have a general anaesthetic where you are asleep during the whole procedure. You should receive the leaflet, **Having an anaesthetic**, which gives you more information. If you do not, please ask us for one. You will have a tube (catheter) inserted into your bladder and in some cases a CSF (cerebrospinal fluid) drain may be inserted before or after the procedure to drain fluid from your spine. A small incision will be made in each side of your groin. For some branched endograft repairs it is necessary to also make a small cut in the left upper arm (axillary) area. A short tube, called a sheath, will then be placed into the artery to keep it open while a thin, flexible tube called a catheter is inserted into the femoral artery and directed to the aneurysm. Contrast (dye) is injected into the catheter and will show up on the x-ray monitor. A metallic spring with a cover (stent graft) that is compressed into a small diameter is passed through the catheter. The stent graft is advanced to the aneurysm, and then opened, creating new walls in the blood vessel through which blood flows. When the stent graft is deployed (opened) it seals the aneurysm.

**What are the benefits?**
Having a fenestrated or branched repair should prevent your aneurysm from bursting. The benefits over traditional surgery are:

- No large abdominal surgical incision
- No sutures (stitches), or sutures only at the groin area
- Faster recovery and shorter time in the hospital
- Less pain
- Reduced complications.
What are the risks?

There is no procedure that is a 100% safe but this type of operation is usually safer than a conventional open aneurysm repair. The risks of the operation can be reduced with stent grafts but not every patient is suitable for this. The stent grafts are made in certain sizes, and the patient's anatomy must fit the graft.

Complications are less common during planned (elective) procedures. The majority of patients have no major problems. You will need to stay in hospital for about two or three days after the procedure to make sure it is safe for you to go home. It is important to be aware of the following possible risks before you sign your consent form:

- Some patients have an allergic reaction to the dye used to obtain the x-ray pictures. This reaction is usually minor, for example a skin rash, which will clear up on its own. On rare occasions, it can be a more serious allergy to the dye, which can be treated with steroids. Please tell your nurse or doctor if you have had a previous allergic reaction.

- The iodine in the x-ray dye can affect kidney function, particularly if there is already some kidney damage. Intravenous fluids and medication can be given before and after the procedure to try to reduce this risk. A routine pre-procedure blood test will always be done to assess your renal (kidney) function.

- Bleeding or bruising can occur under the skin (where the catheter is inserted in the groin). This is known as a haematoma and is very common, and can take one/two weeks to disappear.

- Any procedure that involves placement of a catheter inside a blood vessel (artery) carries certain risks. These risks include damage to the blood vessel, bruising or bleeding at the puncture site, and infection. When performed by an experienced interventional radiologist and vascular surgeon, the chance of any of these events occurring is very small.

- Sometimes incorrect positioning can mean the aneurysm is not completely sealed at the time of the procedure and it may need to be corrected at a later date, either by another endograft or an open operation. There is a chance that the endograft could be positioned incorrectly, resulting in blood flow to a vital organ being blocked, and this could be fatal. If this happens to a renal artery it may result in the loss of a kidney, but usually the other kidney will take over the function. Kidney failure can occur but is usually not permanent.

- There is also a chance that debris from the aneurysm can go down and block off smaller arteries in the leg, which may require an operation to repair.

Are there any alternatives?

Small aneurysms (less than 5.5 centimetres or 2 inches), which are not rapidly growing or causing symptoms, do not burst as often and may require no treatment other than "watchful waiting" under the guidance of a vascular disease specialist. This typically includes follow-up ultrasound examinations at regular intervals to determine if the aneurysm has grown.

The most common treatment for a large, un-ruptured aneurysm is open surgery. This procedure involves an incision from just below the breastbone to the top of the pubic bone. The surgeon then clamps off the aorta, cuts open the aneurysm and sews in a graft to act as a bridge for the blood flow. The blood flow then goes through the plastic graft and no longer allows the pressure of the blood to further expand the weak aorta wall.
How can I prepare?
We will send you information about how to prepare for your hospital stay with your admission letter. Please read this information carefully.

We will review your regular medicines when you come to hospital for your pre-admission appointment. If you are taking any antiplatelet medicines (such as aspirin or clopidogrel) or any medicines that thin the blood (such as warfarin), then you may need to stop them temporarily before the procedure. If you are taking any medicines for diabetes (for example, metformin) or using insulin, then these may also need to be stopped temporarily or the dose altered near the time of the procedure. You will be given full information on any changes that you need to make to your medicines at the pre-admission clinic – please ask us if you have any questions.

We will ask you to fast for six hours prior to the surgery. Fasting means that you cannot eat or drink anything (except water) for six hours before surgery. We will give you clear instructions when to start fasting. It is important to follow the instructions. If there is food or liquid in your stomach during your operation it could come up to the back of your throat and damage your lungs. Please continue to take your regular medicines with a sip of water before 6am on the morning of the procedure, unless you have been told otherwise.

Before the procedure
The devices that will be inserted during the procedure (stent grafts) are custom made specifically for each individual patient. The planning of the graft is made on the CT scan (computerised tomography – a special type of x-ray) you have before your operation. This will be performed about six weeks before your operation.

Giving my consent (permission)
We want to involve you in all decisions about your care and treatment. If you decide to go ahead, you will be asked to sign a consent form. This confirms that you agree to have the procedure and understand what it involves. You should receive the leaflet, Helping you decide: our consent policy, which gives you more information. If you do not, please ask us for one.

What happens before the procedure?
You will be admitted to the vascular ward, which is called Luke ward. On the morning of your procedure, your ward nurse will help you to prepare. You should have a shower or bath but do not use moisturising cream or lotion on your body as the antiseptic used during the procedure may not remove it and it could cause infection. You will be asked to confirm that you understand what is going to happen and that you give your consent. When you arrive in interventional radiology, you will be checked by a radiology nurse and given the opportunity to ask any questions you have.

Will I feel any pain?
It is quite normal to feel some discomfort from the wounds but this will reduce over the first few days after your operation. Painkillers will be given to you by the nurses if you need them.

What happens after the procedure?
You will be taken to the theatre recovery room where you will need to stay flat in bed. You will be closely monitored by radiology nurses who will periodically check your blood pressure, pulse
and oxygen levels. The lumbar (CSF) drain will be kept until your surgeon feels it’s no longer needed.

When your condition is stable and you are well enough to be transferred, you will be taken back to the vascular bay (V-Bay) on Luke ward where you will be monitored to make sure everything is alright. You will rest in bed overnight and you will be able to eat and drink normally.

The following morning we will do some blood tests and you’ll be taken off the monitor that records your heart rate, pulse etc and encouraged to walk around the ward. Any cannulas or lines used to administer medications and pain relief that you have will be removed. You can expect to be allowed home two days after surgery. We will change your dressings the morning you leave hospital.

**What do I need to do after I go home?**

When you go home you should continue with all your usual medications. If you are taking metformin, this should be withheld for 48 hours after the procedure and then continued as usual. You should resume gentle activity and can get back to normal as and when you feel fit.

We will give you a letter which you should take to the practice nurse at your GP surgery two days after you leave hospital. They will check your wound. If you are unable to travel to your GP surgery we will refer you to a district nurse.

**What can I do to help myself?**

**Smoking:** If you are a smoker the single most important thing you can do to help yourself is to give up smoking. Stopping smoking will also help to protect all of your arteries making it less likely that you will suffer from heart attacks or strokes. Giving up is not easy but there is a smoking cessation service and support groups that can help. Your vascular specialist nurse or GP practice nurse can advise you about these.

**Inactivity:** Gentle exercise such as walking and cycling are recommended to help improve your overall level of fitness. Exercise helps your body to produce healthy cholesterol and this helps to protect your arteries against bad cholesterol.

**High blood pressure:** High blood pressure is a known risk factor for rupture of aneurysms. It is very important that you have your blood pressure checked regularly, at least every six months. If you have been prescribed medications for high blood pressure, you must make sure that you take it according to the instructions given.

**Diabetes:** If you have diabetes it is important that your blood sugar levels are well controlled.

**High blood cholesterol levels (fatty substance in your blood):** You should eat a healthy balanced diet and try to reduce any excess weight. It is important to reduce the level of cholesterol in your blood. Your vascular nurse can refer you to a dietician if needed. You may be prescribed medication to help lower your cholesterol level (e.g. a statin) and low-dose aspirin to help prevent blood clots from forming.

**Will I have a follow-up appointment?**

You will be sent a follow up appointment in the post. You will need to have scans at regular intervals using ultrasound and/or CT (different ways of checking the inside of your body) to make sure that the graft remains in the correct position. You will have your first scan after three months and see your consultant in outpatients after four months.
Appointments at King's

We have teamed up with King’s College Hospital in a partnership known as King’s Health Partners Academic Health Sciences Centre. We are working together to give our patients the best possible care, so you might find we invite you for appointments at King’s. To make sure everyone you meet always has the most up-to-date information about your health, we may share information about you between the hospitals.

Contact us

If you have any questions or concerns before or after you have left hospital, please contact the vascular specialist nurses on 07825 503902 (Monday to Friday 8am – 4pm). You can also contact Luke ward on 020 7188 3566 or Sarah Swift ward on 020 7188 8842 (24 hours) and speak to the ward sister or nurse in charge.

The above contacts can put you in touch with the following vascular consultants should you wish to do so: Miss Rachel Bell, Mr Stephen Black, Mr Tom Carrell, Mr Michael Dialynas, Mr Tommaso Donati, Mr Bijan Modarai, Mr Morad Sallam, Mr Mark Tyrell, Mr Hany Zayed, Mr Said Abisi, Mr Andrew McIrvine.

For more information leaflets on conditions, procedures, treatments and services offered at our hospitals, please visit www.guysandstthomas.nhs.uk/leaflets

Pharmacy Medicines Helpline

If you have any questions or concerns about your medicines, please speak to the staff caring for you or call our helpline.

| t: 020 7188 8748 9am to 5pm, Monday to Friday |

Patient Advice and Liaison Service (PALS)

To make comments or raise concerns about the Trust’s services, please contact PALS. Ask a member of staff to direct you to the PALS office or:

| e: 020 7188 8801 at St Thomas’ | t: 020 7188 8803 at Guy’s | e: pals@gstt.nhs.uk |

Language Support Services

If you need an interpreter or information about your care in a different language or format, please get in touch using the following contact details.

| t: 020 7188 8815 | fax: 020 7188 5953 |

NHS 111

Offers medical help and advice from fully trained advisers supported by experienced nurses and paramedics. Available over the phone 24 hours a day.

| t: 111 |

NHS Choices

Provides online information and guidance on all aspects of health and healthcare, to help you make choices about your health.

| w: www.nhs.uk |