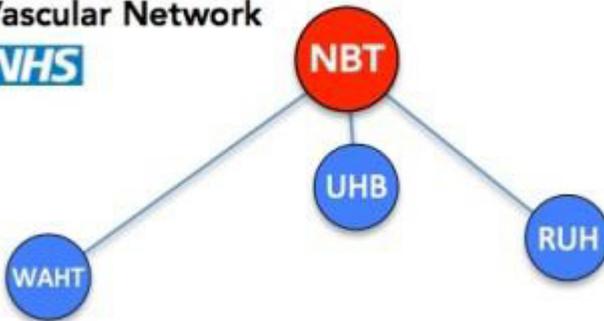


Complex Stent Grafts for treating Complex Aortic Aneurysms

Bristol Bath Weston
Vascular Network



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Ask 3 Questions

Preparation for your Appointments

We want you to be active in your healthcare. By telling us what is important to you and asking questions you can help with this. The three questions below may be useful:



COMPLEX STENT GRAFTING (ENDOVASCULAR REPAIR) FOR COMPLEX AORTIC ANEURYSMS

What does stent grafting involve?

A stent graft consists of synthetic fabric tubes (the graft) mounted onto metal skeletons (stents). It comes pre-loaded in a slim line delivery system, which is used to position the stent-graft in the aorta. The delivery system is small enough to be inserted through an artery in the groin, and we use X-rays to guide the graft into place.

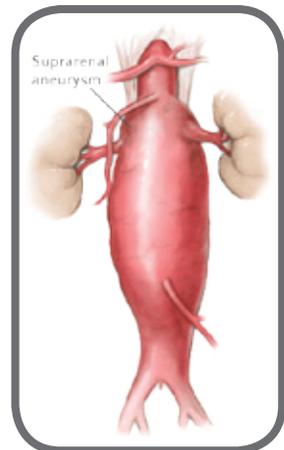
The stent graft is then precisely opened up inside the aorta. The aim of stent grafting is to allow blood to only flow through the stent graft tubes and not into the bulging sac of the aneurysm. In this way we “exclude” the aneurysm and prevent it from rupturing. Over time the aneurysm may shrink back down around the stents.

A standard stent fixes in below the kidney arteries. Your aneurysm is not suitable for this and this is why you are being considered for a complex stent graft. In the UK around 65% of planned AAA repairs are done using standard stents and a smaller number using complex stent grafts.

Why use a complex stent graft?

The shape of an aortic aneurysm or its location in the body may lead to a complex stent graft being considered. A standard stent graft requires a sufficient length of “normal” aorta to fix or “seal” in to allow for a durable repair.

If there is not enough normal aorta below the arteries to the kidneys or if your aneurysm extends into the chest a standard stent graft will not be appropriate. **Your aneurysm is complex.**

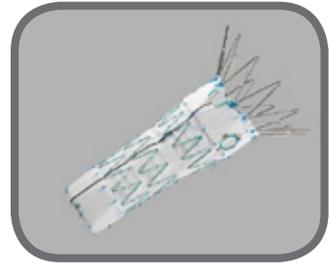


In some cases patients who have had previously had standard stent grafts for AAA (EVAR) or thoracic aortic stent grafts (TEVAR) have further growth of their aorta and develop a “leak” around the stent. These cases may also be suitable for repair with a complex stent graft.

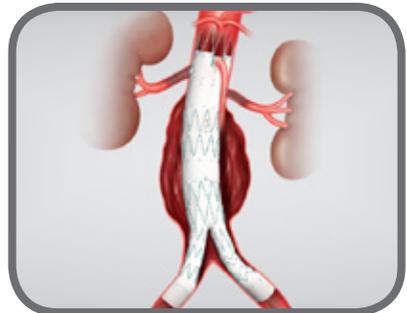
The information from your CT scan will allow your specialist to assess the anatomy of your aneurysm and see if complex stent grafting is technically possible. You will also need a fitness assessment as part of your overall assessment. This will then allow you to decide, with your specialist, if complex stent grafting is right for you.

What does complex stent grafting involve?

The stent grafts used for complex stent grafting usually have one or more elements which are “custom-made” for the individual. Using measurements from the CT scan, and with a planning centre, a technical drawing of the custom graft is made. Your specialist will check these plans before “signing off” the plan. Your graft will then be made by hand to your anatomy. As your graft is “custom-made” and not “off the shelf” there is a delay caused by this process. This delay is around three months from your scan being sent to the planning centre to the graft arriving.



Instead of fixing below the kidney arteries such stents fix around the arteries supplying the liver, the intestines and the kidneys. These stents are made with holes (“fenestrated” stent or fEVAR), side branches (“branched” stent or bEVAR) or a combination of these. These are placed in the



exact position where each artery comes off the aorta. This is to ensure that the main stent “seals” the aneurysm but that the blood supply to the vital organs is maintained.

The main stent graft then has further small stent grafts placed into the arteries to the vital organs. If you have a fenestrated stent graft then this can usually all be performed through two small cuts in the groin. However if you have a branched stent then you will also need another small cut under the collarbone to allow access from above the stent.

Advantages of complex stent grafting

The overall advantages of complex stent grafting are:

- Treat some aneurysms that other methods can't
- Treat some aneurysms via a minimally invasive method that previously would have been treated by open surgery with large abdominal and/or chest incisions. Complex stenting needs
 - Two small cuts in the groin
 - Further cut under the collarbone in branched grafts
- Quicker recovery compared to open surgery
 - Usually 1-2 days on the High Dependency Unit (for monitoring purposes, awake, eating and drinking)
- Most patients discharged by 5 days

In terms of risks:

- Lower risk of death around the time of operation for complex AAA repair than open repair (3.6% for complex stent compared to 19.6% for open surgery)*
- Compared to open surgery*
 - Less chest infections
 - Less heart attacks
 - Less pain
 - No risk of hernia or adhesions in the abdomen

As the procedure is lower risk It means that some patients who would have been too unfit for an open repair can still be treated.

*Data from the UK National Vascular Registry Report 2016

Specific risks/disadvantages in complex stent grafting

- Death
 - The national mortality rate for complex AAA repair with stenting is just under 4% (1 in 25 patients die after having a complex stent)*
- Return to theatre
 - 1 in 14 patients' need to return to theatre in the first few days following complex stent graft repair*
- Kidney failure/Dialysis
 - Stenting the arteries to the kidneys and the higher amounts of kidney toxic X-ray contrast puts patients at risk of kidney failure requiring dialysis
 - This can happen immediately after the operation

- If kidney stents block later this can occur sometime after the operation
- This is more common than after standard EVAR
- Spinal Cord Ischaemia/Paraplegia
 - The blood supply to the spinal cord comes mainly from small arteries off the aorta
 - Complex stent grafts cover more of the aorta and so the risk is higher in these cases
 - The greater the amount of aorta covered the greater the risk
- Several techniques are utilized to minimize this risk:
 - Stent graft planning is done in a way to reduce the risk as far as possible
 - The risk is reduced through staging some procedures i.e. repairing the aorta in two or more operations
 - The risk is reduced through careful monitoring using a “Spinal Cord Protection Protocol”
 - If you develop some weakness in your legs there are a number of ways we can try to increase the spinal cord blood supply to try and reverse the symptoms

Other considerations

- Patients must have continued follow-up of the stent, with scans required at least once a year to make sure that
 - the stents remain in the correct place, do not kink or break
 - blood is flowing through all the stents and not around them stent and into the aneurysm sac (i.e make sure the aneurysm is excluded)
 - the aneurysm is not starting to grow again

- Complex stent grafts have more parts than standard stent grafts and so are more likely to require re-intervention. This may be up to **1 in 3 patients** in their lifetime. In the vast majority the problem can be fixed by doing further procedures under x-ray control, without needing a general anaesthetic.
- Stents can block unexpectedly causing your vital organs, one or both legs to lose the blood supply. This may require emergency surgery.
- The incisions in the groin may result in problems
 - Bleeding from or blockage of the artery in the groin
 - Burning pain in the thighs due to bruising of nerves
 - Wound infection, fluid discharge or lumps in the area of the incision

Getting back to normal activities after complex stent grafting

After complex endovascular repair, most patients are monitored on the High Dependency Unit for two days before returning to the hospital ward for one to three days.

You should be able to eat and drink normally once fully awake following your aneurysm repair. In order to protect your spinal cord we will not let you sit up straight away. You will have your leg movement and pulses checked regularly to make sure there are no concerns about spinal cord ischaemia. Depending on the amount of your aorta that is stented we will let you sit up more and get you out of bed over the next one to two days. The physiotherapists have a set of exercises you can do to keep you recovering whilst in bed. Once you are allowed out of bed we will work with you to get you up and moving and get your mobility back to normal.

When on the High Dependency Unit it is quite common to need some medication to support your blood pressure. This has been shown to reduce your risk of Spinal Cord Ischaemia while the spinal cord blood supply adapts over the two days after surgery.

We will usually keep your urinary catheter in for two days whilst you are in bed but will aim to remove it after this. It is kept initially to allow us to monitor your urine output. Removing it allows you to be more mobile and reduces the risk of catheter related infections.

Once you are up and about, you should be able to leave hospital, but may need painkilling tablets for up to a week. Discussions with patients who have undergone standard endovascular repair suggest that it can be normal to make a full recovery in about 2 weeks, however some people take longer and can tire and take several months to return to the health state they had prior to the operation. This typically takes a little longer after complex stent grafting. During this time, you should gradually build up your level of activity back to normal. You may resume normal sexual relations as soon as you as you feel comfortable.

Balancing the benefits and risks



Southmead Hospital is the centre commissioned by NHS England to perform complex stent grafting for patients across the whole of the South West of England.

Complex stent grafting is more expensive and has higher risks than standard stent grafting. Due to the increased risks it is usual to wait for an aneurysm to grow to 6cm before considering intervention with a complex stent graft, rather than the 5.5cm. To benefit from complex stenting patients must be free of major illnesses or problems that may reduce life expectancy to less than 2 years.

Thinking about how the benefits and risk set out above apply to you is important. To make a shared decision with your specialist it is important that you read through the information and ask questions. This will help you to get the plan that is best for you.

**PATIENT
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