Transjugular Intrahepatic Portosystemic Shunt (TIPS or TIPSS)

Introduction

A transjugular intrahepatic portosystemic shunt (TIPSS or TIPS) is a small tube made of metal and special plastic about 1cm in diameter. The shunt is placed by an interventional radiologist (IR) inside the liver. It is used to treat a condition called portal hypertension. The aim of this procedure is to divert some of the blood going to the liver (through the portal circulation) straight into the great veins and to the heart (the systemic circulation).

What is portal hypertension?

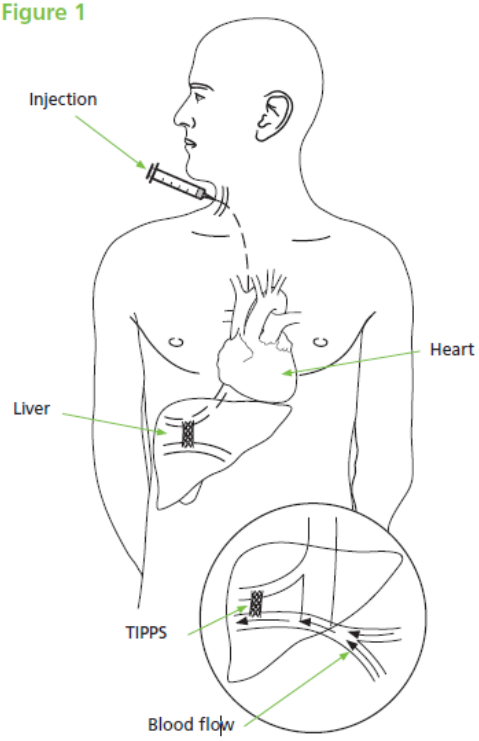
Sometimes with liver disease, blood flow through the liver is restricted causing an increase in the pressure of blood in and around the liver. This is called portal hypertension.

This back pressure of blood can cause a network of swollen, blood vessels to develop in the gullet or stomach. These are called varices. If one of these veins ruptures severe bleeding can occur resulting in vomiting of blood or passing blood as black stools. In some patients portal hypertension can result in a build up of fluid in the abdomen. This is known as ascites.

How does a TIPSS work?

TIPSS is just one way to treat portal hypertension. It involves inserting a metal mesh tube (stent) through the liver which joins two large veins (the portal vein and hepatic vein). This allows blood to flow through the liver and relieves the portal hypertension which causes the large blood vessels in the gut and fluid retention in the abdomen. (Figure 1)

Figure 1



Benefits and alternatives

A TIPSS will be advised to treat one of several conditions. Most commonly it will be used either to stop or to prevent life threatening bleeding from varices when endoscopic treatment is not possible or has been tried and failed. Another use is to help clear ascites that requires regular drainage of fluid with a needle and tube despite treatment with drugs (water tablets) and salt restriction.

Less commonly, a TIPSS will be advised to treat other conditions (such as Budd Chiari syndrome where there is blockage of blood flowing out of the liver resulting in portal hypertension), or may be advised to help patients become better prepared for surgery or liver transplantation. Some patients considered for TIPSS will also be considered for liver transplant at the same time or sometime in the future.

Your doctor will discuss with you the reason for the TIPSS, the benefits and the side effects. The doctor will also discuss the advantages and disadvantages of other possible treatments in your particular case.

At University Hospitals Birmingham, over 800 TIPSS procedures have been performed since 1992. The success rate for stopping active bleeding from varices is over 80% and the success rate for preventing further bleeding is 90%. The ascites is very well controlled in over half of the patients with a further third having some improvement on the ascites. In Budd Chiari syndrome, TIPSS has brought significant improvement to the majority of 88 patients in whom we have used it.

It is very important you discuss any questions you may have with your doctors before the procedure is done.

Preparation

Before a TIPSS can be attempted, the interventional radiologist (IR) needs to make sure that a TIPSS is suitable and possible in your case. Tests such as ultrasound, CT scan or MRI scan may

be needed. In emergency cases, an ultrasound or an angiogram will be done immediately before the TIPSS procedure.

After the procedure has been explained to you and your questions answered, you will be asked to sign a consent form.

Please tell us if you have any allergies.

If you are on blood thinning drugs such as warfarin or clopidogrel it is very important you tell the doctors.

Patients on water tablets are normally advised to stop these drugs at least 24 hours prior to the procedures.

Before the procedure

Before going to the Imaging Department you will be given antibiotics and a small needle (cannula) will be put in a vein in the arm. You should have nothing to eat for at least six hours before the procedure. The exceptions to this are your medicines which should usually be taken before the procedure. However, you may have clear fluids until two hours before the procedure.

X-rays may damage an unborn child. Please tell the doctors and nursing staff if there is any possibility at all that you might be pregnant.

You will be taken to the Imaging Department on your bed. If you require anaesthetic support, you will be escorted and cared for by a team of anaesthetists and nurses throughout the procedure.

In the imaging department

You will be moved from your bed to the X-ray table. Monitoring wires will be attached to your finger and chest to check your pulse and breathing. You will be given a general anaesthetic and put to sleep by the anaesthetic team.

You will be relaxed but not necessarily completely asleep. An oxygen mask will be placed over your face to help you breathe. Your neck will be cleaned with antiseptic solution and then your face will be partly covered by sterile towels. You will then have an injection of local anaesthetic in your neck which may sting for a few minutes.

The procedure

The procedure is performed by a consultant interventional radiologist (IR) who will be helped by assistants and radiographers. You will normally have a general anaesthetic prior to the procedure. A needle will be put into the jugular vein usually on the right side of the neck.

A small plastic tube (catheter) is passed down inside the veins, through the heart into the veins in the top of the liver. A needle is used to make a passage from here to the portal vein inside the liver. A special dye (contrast) is injected to show the liver and the blood vessel leading into the liver (portal vein). Once the catheter is in the portal vein below the liver, the passage through the liver is stretched with a small balloon. A hollow metal tube (stent) is placed in the passage to make a tunnel for blood to flow from the vein below the liver into the main veins draining to the heart. This will lower the pressure in the portal veins and so reduce the risk of bleeding and/or help clear the ascites. The stent is left inside the liver permanently (but is removed if you have a liver transplant).

Sometimes puncture of other veins or an artery is necessary during the procedure. If you are actively bleeding from varices, the radiologist may try to block the bleeding veins from inside during the procedure.

At the end of the procedure all external tubes are removed except for small needle in the arm.

The whole procedure takes about one to three hours. However, you will receive a general anaesthetic for the procedure, hence, you shouldn't feel anything during the procedure. If you have any pain or problems after the procedure, it is important that you let the doctor and nurse know so that more painkillers can be given as required.

You will then be taken back to the ward on your bed. The nurses will check your pulse, blood pressure and temperature for at least six hours after the procedure. You may be sleepy for some time but you will be able to eat or drink as soon as you are awake. Depending on the underlying condition, you may be able to leave hospital after one or two days or you may have to stay in for longer.

Risks and complications

The risks of the procedure are usually related to the severity of the illness. Patients with very severe liver disease who are in hospital or needing intensive care are more likely to have complications. TIPSS is sometimes performed on patients who are very sick or who have very severe liver disease.

Some of these patients are likely to die because of their illness or complications. About 1% of patients having TIPSS die because of complications of the procedure. Your doctors will discuss your situation and any possible alternatives with you before the TIPSS.

In some cases (up to 5%) it is not possible to do the shunt. This may be due to technical problems in which case further alternative treatments will be discussed. You may be offered another try at TIPSS on another day as this can sometimes be successful.

During the procedure the needle may puncture other blood vessels or structures within the stomach, such as the bile ducts or the liver. If this has occurred there is usually no significant complication, but sometimes bleeding or fluid leakage can be serious. If serious complications do arise either during or after the procedure, we will treat them as soon and as effectively as we can. This may involve giving a blood transfusion or even an operation.

There is a small risk of inducing infection in the stomach. You may have been given antibiotics to try and reduce the risk. In some cases, however, the risk is higher if you already have infected bile or abnormalities within the liver. You will be monitored for any signs of infection, and you will then be treated with antibiotics.

In a few cases the procedure can result in jaundice or make existing jaundice worse. This is more likely if you have very advanced liver disease but can also be caused by the blood cells being damaged as they pass through the shunt. There may be a bruise or small bleed from the puncture site in your neck. This usually heals in a few days.

Rarely patients can develop kidney problems because of the dye used during the procedure. The doctors will ensure that your kidney function is satisfactory prior to the procedure, that you are adequately hydrated, and that dehydrating drugs such are water tablets are stopped at least 24

hours prior to the procedure. Sometimes a special drug may be given to you prior to the procedure to protect the kidneys.

The shunt may narrow or clot up in the future. Although this may not cause any symptoms, it may cause the bleeding or ascites to come back. Usually, it is possible to unblock the shunt and to widen it. This requires returning to the Imaging Department. The procedure is usually easier than the insertion of the shunt in the first instance. Sometimes other treatments are required.

The main concern after the procedure is the risk of confusion or sleepiness afterwards (this is called encephalopathy) and may occur in up to 30% of cases. It is more likely in people who have more severe liver disease, in older people and in those who have had previous encephalopathy. The encephalopathy may last only a few days but sometimes it persists. It is often treatable by adjustment of diet and medication. However, this problem can continue in a few patients (5% of encephalopathic patients) unless the stent is deliberately narrowed or closed off. There are associated risks of closing off the TIPSS such as causing a blockage of the portal vein.

Follow-up procedures

If you intend to drive after having TIPSS, it is essential that you discuss this with your doctor and you inform the DVLA.

An ultrasound may be done to show if the stent is working. In some cases, it will be obvious to you if it is working as your ascites will go away. In some patients, we perform a venogram once a year to check the TIPSS. Although this is a much easier procedure than the TIPSS, you will need a day in hospital for this. We will send you an admission letter about this.

If you or your doctors are concerned there may be a problem, then a venogram may be done earlier than planned. Some narrowing or blockage in the shunt happens in 30–50% of cases but this is much less common now as we use a new type of stent.

Questions and further information

If you have any concerns before or after the procedure, it is important that you discuss this with the doctors and nurses.

If you have any problems or concerns, please contact your consultant, Ward 726 or the Imaging Department using the numbers given on this leaflet.

You may find further information about the procedure on the Internet. One possible source of information is the Royal College of Radiologists at **www.rcr.ac.uk** please look under “Patients and Carers” and “Patient Information”.

Contact numbers

Imaging department
Dr H. Mehrzad and Dr Salil Karkhanis **0121 371 2363**
Liver outpatients department **0121 371 4414**
Ambulatory care **0121 371 3100**
Ward 726 **0121 371 7303**
0121 627 7304
Liver pre-screening **07909 687 519**

If you require this information in another format, such as a different language, large print, braille or audio version please ask a member of staff or email interpreting.service@uhb.nhs.uk