University Hospitals
Coventry and Warwickshire
NHS Trust

Neuroscience Unit

Ventriculoperitoneal Shunt

Introduction

Ventriculoperitoneal (VP) shunt insertion is an operation to place a catheter into a brain ventricle to drain cerebrospinal fluid (CSF) from the ventricular system. This fluid will then drain into the peritoneal space (abdominal cavity).

Usually VP shunts are placed to treat hydrocephalus (hydro = water, cephalus = head) that can result from a number of conditions including:

- Subarachnoid haemorrhage,
- Meningitis
- Tumours.
- Normal pressure hydrocephalus

The Operation

The operation is carried out under a general anaesthetic. You are placed on your back with your head on a head ring with your face turned away from the side on which the ventricular catheter is to be placed.

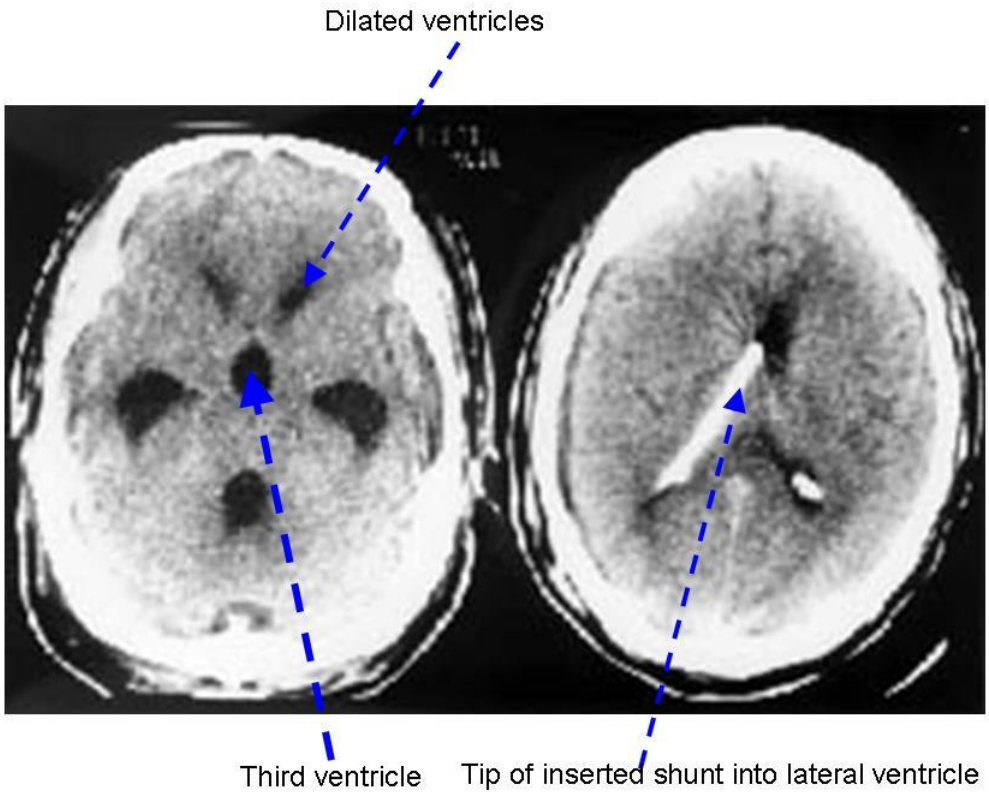
A skin incision is made over the scalp and with a perforator a single burr hole is made. Holes are then made in the dura (covering of the brain) and the ventricular catheter is placed through the opening in the dura.

Subcutaneous tunnel

A hollow metal cannula (tube) is placed under the scalp and pushed forward creating a tunnel first through spaces in the head, then through

the space between the subcuticular (deepest layer of skin) and the fascia of the superficial muscles of the neck, chest, and then the abdomen (stomach).

The abdomen is opened with a small incision. The shunt is then assembled and passed through the metal tube, and connected to the ventricular catheter and the bottom end is inserted into the abdominal cavity. The incisions are then closed.



Post- Operative

After the VP shunt insertion is complete, you will be taken to the recovery area where you are closely monitored. Following this period you will be taken to the Neurosciences ward.

A follow up CT or MRI scan is sometimes carried out to verify that the ventricular catheter tip is located in the correct location in the brain.

Recovery

Most patients are discharged within 2-5 days after a straightforward VP shunt insertion.

The abdominal and scalp incisions usually heal within seven days after which time you may get them wet. Any stitches or staples can be removed by the district nurse or GP practice.

Your return to work will depend on your recovery and the nature of your work. Check this with your consultant.

Driving: Anyone undergoing brain surgery should inform the DVLA. Check with your consultant at your follow-up out-patients appointment for advice about when you can resume driving

Rehabilitation

Rehabilitation may be required for patients with serious long term disability resulting from their hydrocephalus. The disability in most of these patients will neither worsen nor improve with shunting.

Follow up

You will be seen six weeks after the procedure in the Outpatients Department.

Risks and complications

The rate for patients requiring shunt revision is 25.8 %. The most frequent reasons for revisions of the shunt are: under drainage, discontinuation, fracture, infection, and over drainage. The annual valve failure rate was found to be 16.2 %.

Shunt malfunction

- Shunt blockage, together with shunt infection, remains the most common cause of shunt malfunction. In the vast majority of cases of shunt blockage, early investigation and revision of the shunt offers full recovery and discharge from hospital within a few days. In rare situations shunt blockage can be fatal, particularly when the diagnosis is delayed.
- There hasn't been a significant improvement in the level of blockages in recent years. **The rate of shunt blockages is highest in the first year after insertion, when it can be 20-30%. This decreases to approximately 5% per year thereafter.**

- Over half of patients who have a shunt fitted will need at least one shunt revision in the following 10 year period.
- Obstruction can occur in any part of the shunt. If the shunt is not working properly, either all or part of it will need to be replaced. It is the ventricular catheter (the part of the shunt that passes into the ventricles of the brain) where the shunt most commonly blocks. The holes in the shunt tubing may become obstructed by the choroid plexus (this is the membrane which manufactures the CSF) or by a build up of cellular debris.
- The shunt inserted may have a pressure control valve; you will be informed on discharge what type of shunt has been inserted. If your shunt is this type and you have to have an MRI you will need to attend the ward to have the pressure reset.

Revision or re-operation for removal or adjustment of one or all components of a Ventriculoperitoneal shunt system is one of the most common procedures done by neurosurgeons.

Shunt Infection (5-10%)

- This is almost always due to bacteria from the skin getting into the CSF or the shunt at the time of the operation and is remarkably difficult to prevent. Antibiotics have not been shown to be of benefit for this purpose, and other measures often have only a temporary effect, though obviously the care and expertise of the surgical team is one of the most important factors in reducing the rate of infection to a minimum. However, even in the best of hands infection can still occur.
- In VP shunts, infection will usually show itself within a few weeks or months of the operation (usually 2 months), as a shunt blockage with the return of the features of hydrocephalus. There may also be occasional fever and abdominal pain. Redness and swelling may be seen over the lower shunt tubing.

Cranial Complications

- Ventricular catheter blockage
- Malposition of catheter
- Intracerebral haemorrhage
- Disconnection

Abdominal Complications

- Obstruction
- Movement of the catheter from the correct position
- Intestinal injury
- Shunt migration

Tunnelling Complications

- Tunnelling device tip coming through skin
- Lung complications

Others

- Shunt breakage
- Over drainage
- Under drainage

Further Information

If you require any further information or clarification, please contact Ward 43 via Telephone on 024 7696 5330.

The Trust has access to interpreting and translation services. If you need this information in another language or format please contact 024 7696 5205 and we will do our best to meet your needs.

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Document History

Department:	Neurosciences
Contact:	25205
Updated:	December 2019
Review:	December 2021
Version:	7.1
Reference:	HIC/LFT/590/07