Surgical removal of a transobturator mesh sling
or single incision mini-sling

What is mesh?

Mesh is a manufactured material, usually made up of strands of polypropylene woven like a net. There are different types of mesh made of various materials. Mesh can be inserted through different routes to treat a number of medical conditions. Generally, mesh is used to provide support to weakened tissues in the body such as in the abdominal wall to treat hernias. In women, mesh has been used to treat both stress urinary incontinence and pelvic organ prolapse for many years. When used to treat stress urinary incontinence it is referred to as a mesh sling.

Mesh is intended to be permanent once placed in the body. This affects your options for treatment if there are complications, as it can be difficult and sometimes impossible to completely remove. Surgery to remove a mesh sling will depend on the type of sling you have.

What are the different types of mesh sling?

There are three main types of mesh slings used to treat stress urinary incontinence:

- **Trans-obturator mesh slings** (e.g. TVT-O or TOT) support the bladder neck and pass from just under the skin of the front of the vagina, horizontally outward and through the groin muscles (inner thigh).
- **Single incision mini slings** support the bladder neck and are fixed into the tissues using small plastic anchors.
- **Retropubic mesh slings** (e.g. TVT) support the bladder neck and pass from just under the skin of the front of the vagina, behind the pubic bone and up through the abdominal wall.

This information leaflet is for those women who have had a trans-obturator mesh sling (e.g. TVT-O or TOT) or a single incision mini sling.

Reasons why women may choose to have removal of a transobturator mesh sling or mini-sling:

1. Vaginal problems

Mesh can sometimes come through into the vagina if the skin of the vagina doesn’t heal over properly or opens up after surgery. This is called **vaginal mesh exposure**. Sometimes this can happen without you being aware of it and it is discovered when you have a vaginal
examination for another reason. Mesh exposure can cause some or all of the following symptoms:

- Vaginal discharge or bleeding, and vaginal infections.
- Painful sex for you and/or your partner, or bleeding after sex.
- A prickly sensation or being able to feel the mesh in the vagina.
- Pain in the vagina, pelvis, groin, thigh or a combination of these.

2. Bladder or urethral problems

The mesh can also come through into the bladder or the urethra, the tube that releases urine from the bladder. This is called mesh extrusion or perforation. This can happen at the time of surgery or some time (perhaps years) later. It happens much less often than vaginal mesh exposure. It can cause problems including:

- Frequent urinary tract infections (UTIs).
- Blood in the urine.
- Difficulty emptying the bladder.
- Pain when passing urine or having sex.
- Leaking urine or having to get to the toilet quickly (urgency).

3. Other problems

Some women who have had mesh surgery experience symptoms where there may be no obvious cause to explain them. These symptoms can severely impact your physical, emotional and psychological health and your quality of life and can be difficult to treat. Some but not all of these are similar to problems that can also happen after surgery that doesn’t include mesh.

These problems can include:

- Pain or changes in sensation in the back, abdomen, pelvis, leg, vagina or groin.
- New urinary symptoms of either retention of urine (being unable to empty your bladder when full), urge incontinence (sudden and strong need to urinate), persistent or recurrent stress incontinence or pain emptying the bladder.
- Recurrent urinary infections.
- Vaginal discharge.

Some women report the development of autoimmune diseases, fibromyalgia and allergies following their mesh implant. At present there is no scientific evidence to support a link between mesh implants and these conditions or that these symptoms or conditions will improve following mesh removal surgery.
What are the alternatives to mesh removal surgery?

There are several different options for treating mesh complications. The treatment you receive will depend upon the nature of your symptoms, your examination findings and investigation results, and ultimately, your treatment preference. Some women choose not to have mesh removal surgery and prefer to explore non-surgical options rather than proceeding immediately to mesh removal surgery.

The alternative non-surgical options include:

- No active treatment.
- Physiotherapy or other physical therapies.
- Pain management programme, including medication and psychological support.

Combinations of these treatments may be recommended.

This information leaflet explains more about surgical treatment options.

What types of mesh removal surgery are there?

The type of surgery needed to remove mesh varies for each individual woman.

- If the mesh is found to be infected or extruding into one of your internal organs such as your bladder or urethra, it is highly likely that the multidisciplinary team will recommend mesh removal surgery to prevent further harm.
- If the mesh sling has cured your incontinence and you have symptoms that are difficult to reliably attribute to mesh, the decision to proceed with mesh removal surgery is more difficult. In these cases the multidisciplinary team may recommend you do not proceed with mesh removal surgery and may offer you other treatments or a second opinion.

Importantly, it may not be necessary (or possible) to remove all of the mesh to improve symptoms associated with mesh complications, but somewomen prefer this option.

Mesh sling division

The mesh sling can be divided or cut without removing any of the mesh. This option may be offered to help with difficulty emptying the bladder if the mesh sling is thought to be too tight. It may also be considered to relieve tension on the mesh, where this is thought to be causing pain. This is usually a minor procedure which can be carried out as a day case under local, regional (spinal) or general anaesthetic.

Partial removal of the vaginal portion of a transobturator mesh sling or mini-sling

A part of the mesh sling can be removed by an operation through the vagina. This is usually performed if the mesh has come through the vaginal skin (mesh exposure) and is usually
minor procedure removing a few fibres or a few centimetres of mesh. This can be carried out as a day case under local, regional (spinal) or general anaesthesia. **After this procedure it is generally still possible to identify and remove the remaining mesh if needed.**

**Complete removal of the vaginal portion of a transobturator mesh sling or mini-sling**

The entire portion of mesh under the skin of the vagina (usually 5-8cm in length) can be removed. This is a moderate sized operation under general or regional (spinal) anaesthesia, and usually requires an overnight hospital stay. A bandage (pack) is placed inside the vagina at the end of the operation to help prevent bleeding and a catheter is usually left in the bladder overnight. The pack and catheter are usually removed the following day. Although all of the vaginal part of the mesh is removed during this operation, the arms that pass through the groin muscles into the inner thigh are left behind. **It may not be possible to remove the remaining groin mesh or anchors later (see below).**

**Complete removal of a transobturator mesh sling**

Some women decide to have the mesh removed from the groin area at the same time as vaginal mesh removal, so that all of the mesh sling is removed from the body.

Transobturator mesh slings can be difficult to remove completely from their attachments in the groin. It is usually possible to remove the vaginal part of the mesh sling completely but the part of the sling (transobturator mesh sling) that goes into the obturator and groin muscles can be difficult to find. Removal of the mesh in the groin is more feasible if the vaginal part of the mesh has not already been removed as the mesh can be traced from the vaginal end.

Removal of mesh from the groin may be offered to treat problems such as groin or leg pain or weakness thought to be due to the presence of mesh. Some women who have other symptoms decide to have the mesh removed from the groin at the same time as vaginal mesh removal, as they are concerned that this might not be possible as a later date if the vaginal part of the mesh alone is removed.

If you are planning to have a **transobturator mesh sling** removed from the vagina:

- It is not usually necessary to remove the entire mesh for most complications that occur following transobturator mesh slings.
- Your surgeon will discuss how much mesh will be removed and the possible benefits and risks of having the mesh removed from the groins at the same time (complete removal) as this may not be possible after complete removal of the vaginal portion.
- Complete removal of a transobturator mesh sling may not be possible, even when the vaginal part of the mesh has not been removed.

Mesh removal from the groin is a major procedure requiring a hospital stay of 2-4 days and regional (spinal) or general anaesthesia. Sometimes a bandage (pack) is placed inside the vagina at the end of the operation if the vaginal part of the mesh has been removed at the same time, to help prevent bleeding problems and a catheter is left in the bladder.
overnight. Your surgeon may also insert a thin plastic tube (a drain) into the groin to draw
blood away from the tissues at the end of the operation. The drains, catheter and pack, if
used, are usually removed the morning after surgery. The recovery time after groin mesh
removal surgery is usually around 4-6 weeks.

Pain may not be helped by the surgery and may become worse. There is a risk of bleeding
during the procedure and significant bruising may occur afterwards. It is also possible for
nerves to become damaged, causing pain, numbness or weakness in the inside of the thigh.

*Complete removal of a single incision mini-sling with anchors*

Single incision mini slings can be difficult to remove completely from their attachments in
the groin. Plastic anchors hold the single incision mini slings in position in the tissues
surrounding the urethra. These anchors can usually be removed through the vagina at the
same time as mesh removal from the vagina. Sometimes it is difficult to find the anchors in
the tissues, and, even if they are located, they can be difficult or impossible to dislodge from
the tissues. Occasionally it is necessary to make a cut in the groin to remove the anchors but
this is not common. Removal of the anchors is more feasible if the vaginal part of the mesh
has not already been removed.

If you are planning to have a single incision mini sling removed from the vagina
• It is not usually necessary to remove the entire mesh for most complications that
  occur following single incision mini slings.
• Your surgeon will discuss the possible benefits of having the plastic anchors removed
  from the muscles at the same time (complete removal) as this may not be possible
  after complete vaginal removal.
• Complete removal of a single incision mini sling including the plastic anchors may not
  be possible, even when the vaginal part of the mesh has not been removed. It may
  not be possible to locate the plastic anchors in the muscles.

Removal of the vaginal mesh sling and anchors from the muscles is a medium size procedure
that can usually be done with a short hospital stay under a regional (spinal) or general
anaesthetic. Sometimes a bandage (pack) is placed inside the vagina at the end of the
operation to help prevent bleeding problems and a catheter is left in the bladder overnight.
The pack and catheter are usually removed the morning after surgery. The recovery time
after total removal of single incision mini-sling surgery is usually around 2-4 weeks. If a cut
in the groin is needed this will increase the recovery time.

Pain may not be helped by the surgery and may become worse. There is a risk of bleeding
during the procedure and significant bruising may occur afterwards. It is also possible for
nerves to become damaged, causing pain, numbness or weakness in the inside of the thigh.
Removal of mesh from the urethra

Mesh that has gone into the urethra (extrusion or perforation) is a serious complication. The mesh is usually removed by an operation through the vagina. This involves opening up the vagina and urethra to remove the mesh and then repairing the holes in the urethra and the vagina. The urethra is a very delicate organ and the repair may need to be reinforced with a Martius graft to help it to heal. A Martius graft is a piece of fat from inside the labia majora which is tunnelled under the skin to cover the urethral repair to help it to heal.

This is a moderate sized operation and may need hospital stay of 2-4 days. The operation can be done under general or regional (spinal) anaesthesia. If mesh is removed from the urethra, through the vagina, you will need a catheter in the bladder for 1 to 3 weeks, to allow the urethral tissues to heal fully. If the tissues do not heal properly, there is a risk that a fistula will develop. A fistula is a connection between the urethra and the vagina and can cause severe and constant urinary leakage. This is a serious complication which usually needs further surgery to repair it.

Sometimes mesh in the urethra is removed without opening the urethra, either by using a laser in the urethra or by cutting the mesh from the inside of the urethra. This is not always possible. These are smaller procedures than removing the mesh through the vagina and can be done as a day case. However, there is a risk that some mesh will be left behind in the wall of the urethra and that you might need to have further surgery to remove this.

Removal of mesh from the bladder

Mesh that has gone into the bladder (extrusion or perforation) is a serious complication. The mesh can be removed from the bladder using either keyhole or open surgery. During this operation the bladder is opened to remove the mesh and the bladder is then repaired with stitches. Removal of the rest of the mesh from the vagina or from the groin can be performed at the same time as removal of mesh from the bladder.

It is usually necessary to leave a catheter in for around 1 to 3 weeks after this surgery to allow the bladder tissues to heal fully. If the bladder does not heal properly, there is a risk that a fistula (connection between the bladder and the vagina causing severe and constant incontinence) will develop. This is a serious complication which usually needs further surgery to repair it. The recovery time after mesh removal from the bladder is usually around 4-6 weeks.

Sometimes it is possible to remove mesh in the bladder using a laser during a telescopic examination of your bladder (cystoscopy). This is usually a minor procedure that can be done as a day case and may be suitable for people who have medical conditions that make major surgery risky. This approach is not always possible and there is a risk that mesh will be left behind in the wall of the bladder and you may need further surgery to remove this.
Complications of surgical removal of a transobturator mesh sling or mini-sling

Surgical removal of a mesh sling can make some problems worse therefore mesh removal surgery may not be the right treatment option for you. The risks of mesh removal surgery are different for each woman and are dependent on a number of factors such as:

- How close the mesh is to your urethra or bladder.
- The amount of mesh to be removed.
- Previous mesh removal surgery.
- The amount of scarring in the tissues.
- If you have more than one mesh implant in place.

Mesh removal may not help all or even any of the symptoms you feel are related to your mesh implant e.g. groin pain, recurrent urinary infection, vaginal discharge, pain, fibromyalgia, autoimmune conditions. Urinary symptoms may not improve and new symptoms may develop. Even if symptoms do not improve or if they get worse, some women experience a psychological benefit knowing that the mesh implant has been removed from their body.

Possible complications of surgery;

- There is a risk of injury to the urethra or bladder during mesh removal surgery. If this occurs, the injury will need to be repaired immediately. If the injury does not heal properly, a fistula can develop. A fistula is a connection between the urethra or bladder and the vagina and can cause severe and persistent urinary leakage. This is a serious complication which usually requires further surgery.

- There is a risk of significant bleeding requiring blood transfusion, especially with total mesh removal surgery involving surgery to remove mesh or plastic anchors from the obturator muscles or groin.

- Surgery in the groin area carries risk of injury to muscles and nerves. Although the risk is small, if a nerve or muscle injury did occur it could result in permanent leg weakness or numbness (see above).

Complications after the operation (short-term)

- Post-operative pain may be worse than the pain before surgery, especially if you have chronic pain affecting other parts of your body.

- There is a risk of significant bruising and wound infection

- All operations carry a risk of developing a blood clot in your leg or lung (deep vein thrombosis – DVT and pulmonary embolism - PE). The risk of this complication is higher in women having total mesh removal as the operating time is longer and you may be less mobile for a few weeks after surgery.

Complications after the operation (long term)
• There is a significant chance that stress incontinence symptoms will come back after division or removal of the mesh sling. It is difficult to know how likely this is, but the risk is higher the more mesh that is removed. It is possible to have surgery for stress urinary incontinence at the same time as mesh removal surgery. Your surgeon will discuss whether this would be appropriate for you, what your options are and what the added risks of this surgery might be.

• Pain may improve following mesh removal surgery but then return a few months later. There is no guarantee that mesh removal surgery will improve symptoms of pain in the long term.

• You might need further treatment for complications after mesh removal surgery or for urinary incontinence
What I would like to achieve from mesh removal surgery – my goals

After you have considered carefully which treatments might be best for you, use this section to write down your thoughts about each treatment option. You may find it helpful to complete these sections with your doctor.

1. Which symptoms do you hope will get better after mesh removal?

2. Which type of mesh removal have you chosen and why?

3. Do you understand the different mesh removal options and that it is not always possible to remove all the mesh?

4. Any other goals you have from this surgery?
Consultant comments

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<td><strong>This section can be used for the doctor to write down comments about mesh removal surgery that are specific to you personally. This can be done after you have discussed the options with your doctor.</strong></td>
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<tr>
<td><strong>1. Which symptoms are likely to be addressed by having mesh removed?</strong></td>
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<td><strong>2. Which type of mesh removal do you feel is most appropriate and why?</strong></td>
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<td><strong>3. Have the different options for mesh removal and the pros and cons of each been explained and that it is not always possible to remove all the mesh?</strong></td>
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<td><strong>4. Have other goals of surgery been explored?</strong></td>
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Mesh Complication Terms you may have come across

Conservative management
Treatment or management that does not involve surgery.

Mesh erosion
This is a general term for any synthetic mesh or mesh sling that is found perforating an organ after surgery, such as the urinary tract or bowel. This term is also used to refer to mesh exposure or mesh extrusion.
See Mesh exposure, Mesh extrusion.

Mesh exposure
Mesh or mesh sling that is visible in the vagina or rectum. This can be asymptomatic (when the woman is not aware/bothered by the potential problem) or there may be symptoms such as pain or bleeding.
See Mesh erosion, Mesh extrusion.

Mesh extrusion
Passage of the mesh sling gradually out of a body structure or tissue.
See Mesh erosion, Mesh exposure.

Fistula
An abnormal connection that forms between 2 hollow spaces in the body, such as bladder, intestines, or blood vessels. They can form after surgery, injury, infection or inflammation.

Mesh sling
A flat strip of woven synthetic material, usually made of polypropylene, which is placed surgically below the urethra (suburethral) for the treatment of stress urinary incontinence. Mesh slings are often inserted using trocars (needles) and can be placed behind the pubic bone (via the retropubic route) or through a part of the pelvis called the obturator foramen (via the transobturator route). Some mesh slings are also sometimes inserted using only a single vaginal incision (so called ‘single-incision mini-slings’). These devices are also commonly referred to as ‘tapes’.

Multidisciplinary team (MDT)
A team of healthcare professionals that is formed to help diagnose and/or treat complex conditions. MDTs are generally used when it is suitable for care to be provided on an individual case basis and when the complex nature of the condition requires input from many professionals in different areas of medicine.

Retropubic mesh sling
A method to insert a synthetic suburethral mesh sling to treat the symptoms of stress urinary incontinence. A needle is inserted upwards through a small incision in the vaginal wall below the urethra, passing behind the pubic bone and through the abdominal wall. Each arm of the mesh goes through the space behind the pubic bone and into the abdominal muscles in a U shape and supports the urethra. (e.g. TVT, IVS).
Single-incision mini-sling (SIMS)
A surgical procedure to insert a synthetic suburethral mesh sling to treat the symptoms of stress urinary incontinence. The slings are shorter than retropubic and transobturator mesh slings and are inserted using only a single incision in the vagina. The sling is usually attached to the tissues at each end with a small plastic anchor. There are several designs of mini-slings, each of which have different tissue anchor or fixation points. e.g. Non-adjustable: Contasure Needless, TVT-Secur, MiniArc, Ophira; Adjustable: retropubic (Ajust), transobturator (TOA).

Synthetic mesh
A man-made, net-like product. Polypropylene is the most common material that mesh is made from. Other terms used for mesh when used to repair prolapse include tape, ribbon, sling and hammock.

Transobturator inside-out mesh sling (TVT-O)
A method to insert a synthetic suburethral mesh sling to treat the symptoms of stress urinary incontinence. A needle like device is used to insert a mesh sling horizontally through the obturator foramen from an incision in the vagina to an exit point on the inner thigh. Each arm of the mesh lies in the muscles that overlie the obturator foramen and in the muscles of the upper inner thigh.

Transobturator outside-in mesh sling (TOT)
A method to insert a synthetic suburethral mesh sling to treat the symptoms of stress urinary incontinence. A needle like device is used to insert a mesh sling horizontally through the obturator foramen from an incision on the inner thigh to an incision in the vagina. Each arm of the mesh lies in the muscles that overlie the obturator foramen and in the muscles of the upper inner thigh (e.g. MONARC, Obtape).