



Healthcare
Improvement
Scotland

SHTG
Advice on health
technologies

Plain Language Summary

Hernia repair in adults using mesh

SHTG Recommendation | December 2021

What is a hernia?

A hernia is a lump caused by bowel or fatty tissue poking through a weakness in the surrounding muscle or connective tissue. There are different types of hernia. We looked at hernias in the abdomen and the groin. Abdominal hernias can be ventral, epigastric, umbilical, para-umbilical, or incisional. Groin hernias can be inguinal or femoral. Please see *Appendix 1* for definitions of hernia types.



What is surgical mesh?

Surgery is often needed to repair a hernia. Surgeons do this in one of two ways:

1. using surgical mesh to reinforce the abdominal wall
2. stitching the body's tissues together using surgical stitches.

Surgical mesh is usually a woven sheet of plastic (polypropylene). Sometimes it is made of tissue from pigs, cows or humans. The thread used for stitching is made of the same plastic as mesh.

Why is this topic important?

Mesh has been used to surgically treat women with a prolapse or incontinence. In recent years women have spoken about experiencing severe, chronic (long-lasting) pain after this type of surgery. We were asked to review any evidence of similar problems when mesh is used to repair hernias in men and women. About 6,500 hernia repair operations are carried out each year in Scotland.

What we did

We looked for evidence to answer six questions about hernia repairs:

1. Is mesh effective, safe and good value for money compared with stitches?
2. Is there value in using mesh made from animal tissue rather than plastic?
3. Should hernias be repaired using keyhole surgery or open surgery?
4. What is the most effective way to fix mesh in position?
5. Do men and women have different results after hernia surgery?
6. What are patients' experiences and views about hernia repair and mesh?

We used a survey to help us understand what Scottish hernia repair patients thought. The results of our survey are available on [our website](#).

What we found

We did not find evidence on all hernia types for each of the six questions above. In particular, we found little evidence on femoral hernias or studies about value for money.

Comparing mesh and stitches for hernia repair in all adults

Using mesh to repair hernias reduced the risk of them returning by 50% or more compared with stitches. At the same time, using mesh roughly doubled the risk of fluid build-up in the surrounding tissues. These swellings normally resolve without treatment.

We found varying results on the risk of chronic pain:

- For patients with an umbilical hernia, two studies found a lower risk of having chronic pain after mesh repair, one study found a higher risk of this, and one study found no difference between using mesh and using stitches.
- One analysis of many studies found that the chance of having chronic pain after inguinal hernia repair was 40% lower using mesh. Another analysis found no difference.

A UK study found that using mesh to repair inguinal hernias led to fewer hernias returning and less chronic pain than stitches. Using mesh also led to cost savings for the NHS.

Comparing plastic mesh and tissue mesh in adults

The chance of a hernia returning was similar for patients treated with plastic mesh or tissue mesh. One analysis suggested the risk of wound infection might be lower in patients treated with tissue mesh.

The risk of chronic pain after groin hernia repair was similar when plastic mesh or tissue mesh were used.

Tissue mesh was generally more expensive than plastic mesh.

Comparing open surgery and keyhole surgery in adults

The chances of a hernia returning were similar after open or keyhole surgery. The risk of getting an infection was four or five times greater with open surgery.

For patients with a ventral or groin hernia, the risk of having chronic pain was similar after open or keyhole surgery.

In some studies, keyhole surgery was cheaper than open surgery. In other studies, keyhole surgery was more expensive.

Comparing ways of fixing mesh within the body (all adults)

Mesh is fixed in position using permanent tacks, absorbable tacks, glue, stitches, or staples. Some newer mesh holds itself in place (self-gripping).

Analyses of multiple studies found that the risk of a hernia returning was similar for all the mesh-fixing options.

For patients with a ventral or groin hernia, the risk of having chronic pain after surgery was similar for all mesh-fixing options.

Mesh safety

In 2015 to 2020, 161 patients in Scotland had mesh removed from the site of a hernia repair. Fifty-five of the operations were in women and 106 in men. We do not know why the mesh was removed.

Infections related to mesh used for hernia repair occurred in 7.2% of patients with a ventral hernia repair and 0.3% of patients with a groin hernia repair. The risk of an infection was higher in patients who smoked, needed an emergency hernia repair, or were older.

Patients' views and experiences

Patients described how having a hernia or a hernia repair affected many aspects of their daily life such as going to work, caring for children, and lifting heavy objects.

While some patients find online information about mesh useful, others said it made them more worried about their condition. Before deciding whether or not to have a hernia repaired, patients want to know about the benefits and risks of mesh, and their treatment options.

A study in the USA found that personal experience and reading about mesh in the media had the most influence on what patients think about mesh.

Two non-UK studies reported that women were about 30% less likely to have keyhole surgery to repair a groin hernia compared with men. Neither study could explain why women were less likely to have keyhole surgery.

Results of hernia repair in women

We did not find much evidence specifically on hernia repair in women.

In two studies, there was no difference in the risk of a groin hernia returning in women after surgery using mesh compared with surgery using stitches.

We found evidence suggesting that groin hernias return less often in women who have keyhole surgery compared with women who have open surgery.

One study, in over 8,000 patients with an incisional hernia, found that women were more likely than men to have chronic pain 1 year after surgery.

What SHTG Council considered when developing advice for NHSScotland

The SHTG Council is responsible for making recommendations about medical devices to the NHS in Scotland. The Council is made up of people who work in healthcare, universities and healthcare research. There are two members of the public on the Council.

1. The Council took into account evidence from the published literature and responses to a patient survey.
2. The Council considered the practicalities of offering hernia repair using stitches. Clinical experts at the meeting were unsure how much surgical expertise on stitch-based repairs is available in Scotland. They agreed that patients should have access to alternatives to mesh repair. Equal access to repairs using stitches may mean transferring patients to a different health board area.
3. The Council recognised that chronic pain is an important issue for patients.
4. The Council noted there could be other safety outcomes relating to hernia repair using mesh that we did not find in the literature; for example, inflammatory reactions to mesh, or meshomas (where the mesh comes loose and forms a clump). Discussions between patients and clinicians should include these outcomes.
5. The Council and clinical experts discussed the risks of removing mesh after a hernia repair. The clinical experts said there was a risk of damage to surrounding tissues, such as the bowel, when attempting to remove mesh.
6. The Council discussed whether the findings from two reports on the experiences of women who had a prolapse repaired by mesh could apply to hernia repair using mesh. The two reports are the Cumberlege [First do no harm](#) report (2020) and the [My Path, My Health, My Life](#) report (2021). Findings that the Council felt applied to hernia repair were:

- a. the need to create a database of hernia operations and outcomes
 - b. the importance of keeping patients informed and engaged in their treatment, and
 - c. open, frank discussions between patients and clinicians as part of a shared decision-making process.
7. Council members highlighted the importance of clear and accessible patient information on hernia repair. There is a national [It's OK to Ask](#) campaign. The campaign encourages patients to ask questions of their healthcare providers. The Council felt this was a valuable tool to promote to patients who need a hernia repair.
8. Potential equality issues were highlighted to the Council. These include:
 - a. gender inequality in hernia treatment options
 - b. the religious or other beliefs affected by using mesh made from animal tissues, and
 - c. equality of access to treatment options.
9. The Council discussed the lack of data on long-term data for patients who had a hernia repair using mesh. The importance of recording this data in future was discussed.
10. The Council acknowledged that the British Hernia Society is creating a database of hernia repair outcomes in the UK.

What is our advice to NHSScotland?

The evidence supports the continued availability of mesh as an option for the repair of ventral, incisional, and inguinal hernias in adults in Scotland.

Patients may prefer a non-mesh hernia repair. Access to alternative hernia management options should be available to them.

Before a hernia repair, the patient and surgeon need to have a detailed discussion as part of an informed consent process. Points for discussion include:

- the benefits and risks of surgical and non-surgical hernia treatment options
- the fact that neither mesh nor stitching repair of hernias is risk free
- the risk of developing chronic pain after a hernia repair, especially for patients who have pain as their main symptom, and
- the uncertainty about the long-term effects of hernia surgery (with mesh or stitches) because few studies followed patients for more than 1 year.

Healthcare professionals should give patients detailed verbal and written information about hernia repair.

The decision on whether to do keyhole or open hernia repair surgery should be based on:

- the patient's medical history

- the type, size and location of the hernia, and
- the surgeon's expertise.

The decision on which mesh-fixing method to use in hernia repair should be based on:

- surgical expertise
- the type and size of hernia
- whether the patient is having keyhole or open surgery, and
- the type of mesh being used.

It is important that data on the long-term results of hernia repair are recorded at a national level to inform future decision-making.

Future work

We need more research on hernia repair in patients with femoral hernias and on hernia repair in women. Studies on the value for money of hernia repair in the UK would also be useful.

This plain language summary has been produced based on SHTG Recommendation, December 2021.

We are happy to consider requests for other languages or formats. Please phone 07929 026658 or email his.shtg@nhs.scot

Appendix 1: definitions of hernia types

The name of a hernia often relates to where on the body it occurs.

Ventral hernia: these hernias occur anywhere on the front of the abdomen. Epigastric, umbilical, para-umbilical and incisional hernias are all types of ventral hernia that occur in particular places on the abdomen.

Epigastric hernia: these hernias occur when fatty tissue pokes through the abdominal wall between your belly button and the lower part of your breastbone.

Umbilical hernia: these hernias occur when fatty tissue or part of the bowel pokes out at your belly button.

Para-umbilical hernia: these hernias occur when fatty tissue or part of the bowel pushes through the abdominal wall near your belly button.

Incisional hernia: these hernias occur anywhere on the abdomen where you have had surgery. Tissue pokes through the surgical wound before it has fully healed.

Inguinal hernia: these hernias occur when fatty tissue or a part of the bowel pokes through into your groin. Inguinal hernias can appear as a swelling or lump in your groin or as an enlarged scrotum (the pouch containing the testicles) in men.

Femoral hernia: these hernias occur when fatty tissue or part of the bowel forms a lump in the inner, upper part of the thigh or groin.