PROCEDURE

Open pleural biopsy

An open pleural biopsy removes tissue from the chest lining through a surgical incision for laboratory testing.

PURPOSE
Obtain pleural tissue for laboratory diagnosis

PROCEDURE TYPE
Diagnostic surgery through an incision in the chest

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General anaesthesia

HOW LONG IT TAKES
About 30-90 minutes, longer with additional surgery

PREPARATION
Fasting and a medication review, including blood thinners

RECOVERY
Overnight or longer; no driving until cleared

MAIN RISKS
Bleeding, infection, persistent air leak, anaesthesia complications

RESULTS
Usually several days; special laboratory tests may take longer

Overview

An open pleural biopsy is an operation to remove small samples of pleura. The pleura is a thin, two-layered membrane around each lung and along the inside of the chest wall.

The surgeon reaches the pleura through an incision between the ribs. You are under general anaesthesia, so you are unconscious and do not feel the operation. A temporary chest drain is usually left in place to remove air or fluid and help the lung remain expanded.

The samples are examined by a pathologist, a doctor who diagnoses conditions by studying cells and tissue. Open biopsy provides larger samples than a needle biopsy, but it involves a larger incision and longer recovery.

Open pleural biopsy is now used less often because many people can have a needle biopsy or

keyhole procedure instead. It may still be appropriate when less invasive tests have not provided an answer or cannot safely reach the affected area.

Why the procedure is performed

Your healthcare team may recommend an open pleural biopsy when scans show pleural thickening, a mass, or unexplained fluid around a lung. It may also be considered when previous fluid tests or smaller biopsies did not establish a diagnosis.

The tissue can be examined for:

The result may guide decisions about treatment. Before recommending surgery, your team should consider whether the information is likely to change your care and whether a less invasive test could provide it.

- Cancer affecting the pleura, including mesothelioma or cancer spread from elsewhere
- Infections such as tuberculosis or fungal infection
- Inflammation, scarring, or other pleural disorders

Who should and should not have it

Open pleural biopsy may be suitable if a reasonably large tissue sample is needed, earlier tests were inconclusive, or keyhole and image-guided approaches are not possible. It can also be done during another planned chest operation.

It may not be the right option if the same information can be obtained safely with a needle biopsy, fluid sample, or thoracoscopy. Thoracoscopy uses a camera through one or more small openings in the chest.

The operation may be avoided or delayed if you have:

The procedure should not go ahead without your informed consent. You can ask what the biopsy might show, how the result would affect treatment, and why a less invasive option is not being recommended.

- A blood-clotting problem that has not been corrected
- Blood-thinning medicine that cannot yet be safely managed
- An active skin infection near the planned incision
- Severe or unstable heart or breathing problems that make anaesthesia unsafe

- An illness that needs treatment before non-emergency surgery
- A health condition that makes the likely benefit too small compared with the surgical risk

How to prepare

Follow the instructions from your treating facility, as its own instructions take priority. They will tell you when to stop eating and drinking before the anaesthetic.

Give the team a current list of medicines, supplements, allergies, and previous reactions to anaesthesia. Tell them if you take blood thinners, including anticoagulants or antiplatelet medicines. Do not stop these on your own; the surgical team will give you a specific plan.

You may have blood tests, heart testing, chest imaging, or breathing tests before surgery. These help the team plan the anaesthetic and operation.

Smoking can increase the chance of breathing problems and slow wound healing. If you smoke, ask what support is available to help you stop or reduce smoking before surgery.

Arrange transport home and help during your early recovery. Bring comfortable clothing that does not press tightly against the incision.

What happens during the procedure

In the operating theatre, staff confirm your identity, the planned procedure, and the side being treated. Monitoring equipment checks your heart rate, blood pressure, breathing, and oxygen level.

An anaesthetist gives you general anaesthesia. A breathing tube supports your breathing during the operation.

The surgeon makes an incision in the chest wall, usually between two ribs. The ribs may be gently separated to reach the pleura. The surgeon examines the area and removes one or more tissue samples. Fluid may also be collected for testing.

The samples are sent to a laboratory. Depending on why the biopsy is being done, they may be checked for abnormal cells, infection, inflammation, or specific proteins and genetic changes.

A chest drain is commonly placed before the incision is closed. It connects to a drainage container and removes air, blood, or fluid from around the lung. The wound is closed with stitches, clips, or surgical glue and covered with a dressing.

Recovery and what to expect afterward

Pain: Soreness around the incision and discomfort from the chest drain are expected. Taking pain relief as offered can help you breathe deeply, cough, and move. Tell staff if pain is preventing these activities.

Eating: You can usually start with drinks and light food once you are awake and not feeling sick. Your normal diet can often restart as tolerated unless the team gives different instructions.

Activity: Staff will encourage deep breathing, coughing, and early movement to reduce chest complications and blood clots. The drain is removed when air and fluid drainage have settled and the lung is adequately expanded. Avoid heavy lifting and strenuous exercise until your surgeon says the wound has healed enough.

Driving: You cannot drive home after general anaesthesia. Do not drive while taking medicine that makes you drowsy or while pain limits your ability to turn, brake firmly, or control the vehicle. Follow the surgical team's clearance and any insurer requirements.

Work: Return-to-work timing is based on wound healing, pain, the type of work you do, and whether further treatment is needed. Desk work may be possible sooner than lifting, driving, or physical work. Ask for a tailored plan before leaving hospital.

Risks and possible complications

Your team should explain your personal risks before you consent. Possible complications include:

A biopsy may sometimes be nondiagnostic. This means the sample does not establish the cause, and another test may be needed.

- Bleeding, which occasionally needs a blood transfusion or another procedure
- Infection of the wound, chest space, or lung
- Air leaking from the lung longer than expected, delaying drain removal
- A collection of air or fluid around the lung
- Temporary areas of poorly expanded lung or a chest infection
- Persistent pain, numbness, or altered sensation near the incision
- Blood clots in the legs or lungs
- Reactions or breathing and heart complications related to anaesthesia
- Injury to nearby structures, which is uncommon but may require further treatment

Results and follow up

The surgeon may describe what was seen after you wake, but appearance alone usually cannot provide a final diagnosis.

A pathologist processes and examines the tissue. Initial results are often available within several days, but infection tests, special stains, or molecular testing can take longer. Ask when and how you will receive the result.

At follow-up, the team may check your wound, breathing, chest imaging, and recovery. They will explain what the laboratory found and whether you need treatment, surveillance, or another test.

Keep routine questions about activity, wound care, and results for your planned review unless they become urgent.

Alternatives

The best alternative is based on where the abnormal area is, the amount of tissue required, your overall health, and what earlier tests have shown.

- Pleural fluid sampling: Fluid is removed with a needle and tested. It is less invasive, but it can miss disease and may not provide enough tissue for a precise diagnosis.
- Image-guided needle biopsy: A radiologist guides a needle using ultrasound or CT. Recovery is usually quicker, but the samples are smaller and a patchy abnormality may be missed.
- Medical thoracoscopy: A camera and instruments enter the chest through a small opening, usually with local anaesthetic and sedation. It allows targeted biopsies and fluid drainage but is not suitable for every person or pleural pattern.
- Video-assisted thoracoscopic surgery: Keyhole surgery uses a camera and small chest incisions under general anaesthesia. It usually causes less surgical trauma than an open approach, but it is still an operation and may not be possible when dense scar tissue blocks access.
- Repeat imaging or observation: This avoids an immediate invasive test but may delay a diagnosis. It is generally considered only when the expected benefit of biopsy is low or the surgical risk is high.

When to call your healthcare team

Contact your surgical team promptly if you develop increasing redness, warmth, swelling, discharge, or opening of the wound. Also seek advice for a fever, worsening breathlessness, pain not controlled by the prescribed plan, or repeated vomiting that prevents drinking.

If you go home with a drain, follow the facility's instructions. Contact the team urgently if the drain comes out, disconnects, stops working, or suddenly collects much more blood or fluid.

Call emergency services for severe difficulty breathing, fainting, new confusion, heavy bleeding, coughing up more than a small streak of blood, or sudden severe chest pain. Do not wait for a routine follow-up appointment for these symptoms.

Common questions

Will I be asleep?

Yes. An open pleural biopsy is normally performed under general anaesthesia, so you are unconscious throughout the operation.

Can I drive home?

No. You will need someone else to take you home. Driving can remain unsafe while you have significant pain, limited movement, or medicines that cause drowsiness.

How painful is it?

Pain and soreness are expected because the incision passes through the chest wall. The chest drain can also be uncomfortable. Staff provide pain relief and adjust it if pain interferes with breathing, coughing, sleeping, or walking.

How long will I be in hospital?

Many people stay at least overnight. A longer stay may be needed if the drain remains in place, an air leak continues, pain needs more treatment, or other surgery was done at the same time.

When will I know the result?

The surgeon may share immediate observations, but the final answer usually comes from laboratory examination over several days. Special infection or molecular tests can take longer.

Will I have a scar?

Yes. An open biopsy leaves a scar on the side of the chest. Its size and position are based on where the surgeon needs to reach the pleura.

Sources

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