

Biopsy

A **biopsy** (the term reflects the Greek words *βίος bios* – life, and *ὄψις opsis* – a sight) is a diagnostic procedure involving extraction of sample cells or tissues for examination to determine the presence or extent of a disease.

The tissue is generally examined under a microscope by a pathologist; it may also be analyzed chemically. When an entire lump or suspicious area is removed, the procedure is called an **excisional biopsy**. An **incisional biopsy** or **core biopsy** samples a portion of the abnormal tissue without attempting to remove the entire lesion or tumor. When a sample of tissue or fluid is removed with a needle in such a way that cells are removed without preserving the histological architecture of the tissue cells, the procedure is called a needle aspiration biopsy. Biopsies are most commonly performed for insight into possible cancerous or inflammatory conditions.

Biopsy procedure

There are various types of biopsy that can be used to help identify a wide range of health conditions. How a biopsy is carried out will depend on from where the tissue sample is being taken.

Different types of biopsy include:

- a **punch biopsy** – a special instrument punches a small hole in the skin to obtain a skin sample to investigate a skin condition
- a **needle biopsy** – a special hollow needle, guided by X-ray, ultrasound, CT scan, or MRI scan, is used to obtain tissue from an organ or tissue underneath the skin
- an **endoscopic biopsy** – an endoscope is used to remove tissue, such as from the stomach during a gastroscopy
- an **excision biopsy** – surgery is used to remove a larger section of tissue

An operation can start with a biopsy with the sample being tested straight away so that the surgeon can carry out appropriate surgery using the diagnosis provided.

After the tissue sample has been removed, it can be tested using various chemicals to see how it responds and to find out what it contains. The type of tests used will depend on the medical conditions being investigated and the features of the tissue sample.

Results

The histopathologist examines tissue biopsies with the naked eye to look for any visible abnormalities and to select pieces to examine in more detail under the microscope. These small pieces are treated with chemicals so that very thin slices can be cut and to prevent them from rapid autolysis. The slices are stained to show different parts of the cells and examined under a microscope to see whether the tissue is abnormal. If it is, the aim is to identify the nature of the problem. This often means that a definite diagnosis is made. They also examine cells in bodily fluids (cytopathology) such as urine, and also in large specimens, for example from surgery for bowel or breast cancer. These specimens are dissected ('cut up and trimmed') to select the most appropriate areas to examine under the microscope.

Medical use

- **gynecology:** a cervical biopsy is a **procedure to remove tissue from the cervix to test for abnormal or precancerous conditions**, or cervical cancer
- **nephrology:** a kidney biopsy is a procedure to remove a small piece of kidney tissue with a needle that can be examined under a microscope for signs of damage or disease
- **gastroenterology:** biopsies are commonly taken during an endoscopic investigation of gastrointestinal lesions and inflammatory conditions. There is conflicting evidence as to the benefit of biopsy of mucosa that appears normal endoscopically
- **perioperative biopsy:** if consent has been given, a perioperative biopsy can be carried out during surgery; in certain circumstances, the sample may be tested straightaway to help guide the surgery or further treatment
- **oncology:** imaging-guided percutaneous biopsies in patients in oncology provide an accurate diagnosis of



Bone marrow biopsy



Bone marrow biopsy needles



Fine-needle aspiration

Links

Bibliography

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