

# Invasive investigation methods

Interventional radiology deals with medical procedures using imaging methods. It is an integral part of the work of a radiologist.

## According to imaging methods

Interventions can be carried out under control:

- **fluoroscopy** : dynamic imaging of the examined area and navigation under X-ray control - insertion of stents into the gastrointestinal tract, ERCP , PTC, insertion of a nasojejunal probe, adjustment of the drain position, kyphoplasty, vertebroplasty, but also interventions in angiography , biopsy ,
- **ultrasound** : biopsy or puncture navigation,
- **CT** : CT guided biopsy, puncture, drainage, root canal, RFA , ethanolization of the deposit, kyphoplasty, vertebroplasty,
- **MR** : MR guided biopsy, puncture.

## Biopsy

- Under X-ray control, X-ray contrast formations can be biopsied, most often microcalcifications of the breast or kidney after administration of iodine contrast material iv
- Biopsies under MR control can only be performed on an open MR device using special MR-compatible instrumentation.
- Biopsies under ultrasound control can be performed using a special attachment that fixes the position of the needle and allows the position of the biopsy channel to be visualized in advance, or without it (free from the hand).
- Biopsy under CT control.

## Radiofrequency ablation - RFA

 For more information see *Radiofrequency catheter ablation*.

The method can be used to treat primary tumors and metastases ideally up to a size of 3 cm (max. 5 cm). Under CT control, an instrument is introduced from which antennas are extended in the relevant organ, which cause thermal necrosis of the bearing due to the action of radio frequency waves. When removing the instrumentation, RFA of the created channel is also performed in order to minimize the risk of implantation metastases during its course.

## Ethanolization

After inserting the needle into the lesion, most often under CT, 100% ethanol is applied, which causes cell necrosis at the site.

## Kyphoplasty

Kyphoplasty means the filling of a compressed vertebral body with cement after its decompression with a balloon. Can be performed under both fluoroscopy and CT controls.

## Vertebroplasty

During vertebroplasty, the compressed vertebral body is filled with cement. It can also be performed under fluoroscopy and CT controls.

## Interventions on the gastrointestinal tract

These are most often:

- stent insertion under fluoroscopic control for tumorous or postoperative stenosis or violation of wall integrity,
- insertion of a nasojejunal probe under fluoroscopic control

## Angiography

 For more information see *Angiography*.

## Endoscopic retrograde cholangiopancreatography - ERCP

 For more information see *Endoscopic retrograde cholangiopancreatography*.

## Percutaneous transhepatic cholangiography - PTC

In some cases where drainage of the bile ducts cannot be ensured by ERCP, probing of the intrahepatic bile duct by percutaneous puncture with a Chiba needle and insertion of a thin drain into the bile ducts via a metal guide can be performed.

## Links

### External links

- Images at atlas.mudr.org (<http://atlas.mudr.org/>)
- Czech Society of Interventional Radiology at [www.csir.cz](http://www.csir.cz) (<http://www.csir.cz/>)
- Learning portal 1. LF UK – Radiodiagnostics: Quiz Invasive examination methods (<https://connect.cuni.cz/system/get-player>)