

Interventional Oncology

Patient Awareness

Interventional Radiology:
your alternative to surgery

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Cardiovascular and Interventional Radiological Society of Europe

CANCER : The Whys and Hows

Minimally invasive treatments help cancer patients extend life and improve quality of life

What is Cancer?

Normally, cells grow and divide to form new cells as the body needs them. Old cells eventually die and new cells take their place. Sometimes, this orderly process goes awry: new cells form when the body does not need them and old cells do not die when they should. These extra cells can form a mass of tissue, or tumour. Cancerous tumours are abnormal and divide without control or order. Metastases occur when a single tumour cell or clump of cells gain access to the blood stream or lymphatic system, travel to a new organ, multiply and then regrow their vascular structure to obtain food.

Diagnosis of Cancer

Various tests can help in the diagnosis of cancer, including:

- blood tests
- physical examination
- imaging techniques
- biopsy

a sample of tissue from the tumour or other abnormality is obtained and examined by a pathologist

Open surgery is sometimes performed to obtain a tissue sample for biopsy. In most cases, tissue samples can be obtained without open surgery with interventional radiology techniques.

Needle Biopsy

Also called image-guided biopsy, is usually performed using a moving X-ray technique (fluoroscopy) or computed tomography (CT) to guide the procedure, allowing radiologists to see an area inside the body from various angles. This "stereotactic" equipment helps them pinpoint the exact location of the abnormal tissue.

Fine Needle Aspiration

A similar technique called fine needle aspiration can be used to withdraw cells from a suspected cancer. It also can diagnose fluids that have collected in the body.

Surgical removal of tumours offers the best chance for a cure. Unfortunately, tumours are often inoperable due to their large size or metastasis.

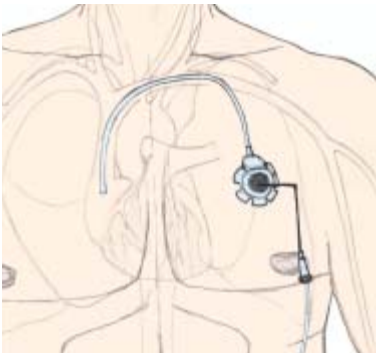
Your Treatment Options

Radiotherapy



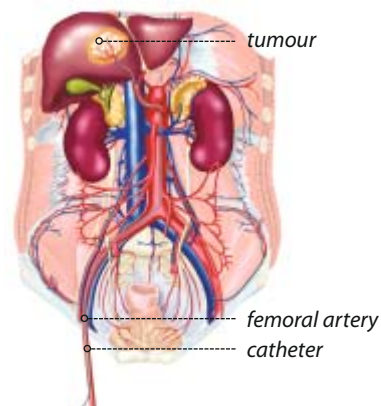
High energy radiation is used to destroy the tumour. This generally requires many sessions over weeks or months.

Chemotherapy



An implantable chamber is inserted under the skin and a small catheter drives the chemotherapy into the veins. Chemotherapy requires careful maintenance of the implantable port and numerous chemotherapy sessions are used.

Liver Chemoembolisation



Under local anaesthesia, a catheter is inserted into the femoral artery. Using careful and expert manoeuvres, the interventional radiologist pushes the catheter into the hepatic artery and through it, injects the chemotherapeutic agents at a very high dose. As injection is carried out selectively, it is possible to inject very high doses that are able to destroy the hepatic cancer.

Embolization Techniques

In some patients, embolization may shrink the tumour substantially, rendering the patient a suitable surgical candidate. In others, arterial embolization effectively eliminates tumour-related symptoms and improves patients' quality of life.

Chemoembolization delivers a high dose of cancer-killing drug (chemotherapy) directly to the organ while depriving the tumour of its blood supply by blocking (embolizing) the arteries feeding the tumour.

Transcatheter Embolization

Interventional radiologists inject tiny particles, the size of grains of sand, through a catheter and into the artery that supplies blood to the tumour. The particles cause clotting that decreases the tumour's blood supply, reducing pain.

Yttrium-90 Radioembolization

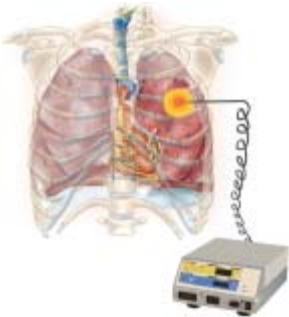
Radioembolization is very similar to chemoembolization but with the use of radioactive microspheres.

Liver Zoom



Microparticles loaded with the chemotherapy are injected directly into the tumour and destroys it very selectively without damaging the normal part of the liver.

Lung Radiofrequency



Under general anaesthesia, the interventional radiologist places a needle through the skin into the lung under CT guidance. The needle is connected to the generator that will deliver the radiofrequency current solely into the tumour.

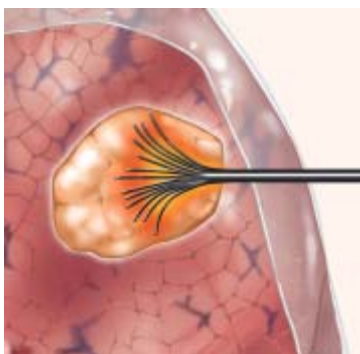
Ablation Treatments

Radiofrequency Ablation (RFA) offers a non-surgical, localised treatment that kills the target tissue with heat, while sparing the healthy tissue.

Cryoablation is similar to RFA in that the energy is delivered directly into the tumour by a probe that is inserted through the skin. Rather than killing the tumour with heat, cryoablation uses an extremely cold gas to freeze it.

Laser Therapy causes cell death through the delivery of laser energy by a fibre-optic probe that is inserted into the tumour using imaging for guidance.

Lung Zoom



The probe of radiofrequency is deployed into the lung cancer under imaging guidance. High energy is delivered locally and kills the tumour.

Surgery



The surgeon opens up the abdomen under general anaesthesia and removes the tumour.

Treatments for Cancer Complications

There are also a number of interventional radiology techniques that are used to treat the complications of cancer, including pain, bleeding, and obstruction of vital organs, blood clots and infection. Although these treatments do not cure cancer, they can make patients more comfortable, extend life by treating serious complications and improve the quality of life for cancer patients.

How can interventional radiology improve the diagnosis and treatment of cancer?

Many procedures:

- require only an outpatient or a short hospital stay
- offer new cancer treatment options
- are less painful and debilitating for patients
- result in quicker recoveries
- have fewer side effects and complications



DNA

NEW CANCER TREATMENTS ON THE HORIZON

Interventional Radiology is playing a significant role in developing new techniques that may improve cancer treatment in the future.

"Magnetic" Chemotherapy

Interventional radiologists are currently investigating a new technique in which magnets are used to pull chemotherapy drugs into tumours. Physicians are hopeful that it will boost the effects of chemotherapy while avoiding some of the drugs' side effects, such as hair loss and nausea.

Gene Therapy

In recent years, scientists have gained a new understanding about genes and the role they play in disease. This knowledge has set the stage for medical science to alter patients' genetic material to fight or prevent cancer.

These techniques are still investigational, but they offer new hope in the war against cancer

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