

# PRINCIPLES OF CANCER MANAGEMENT

# Treatment

surgery

- Radiotherapy

Chemotherapy

Hormonal Therapy

(single or multimodality)

# Surgical Oncologist

- **“A surgical oncologist is a well-qualified surgeon who has obtained additional training and experience in the multidisciplinary approach to the prevention, diagnosis, treatment, and rehabilitation of cancer patients, and devotes a major portion of his or her professional practice to these activities and cancer research.**
- *”Society of Surgical Oncology Training Program Guidelines, 2004*

# PRINCIPLES OF CANCER MANAGEMENT

## SURGICAL ONCOLOGY

# surgical Management of cancer

Prevention

Diagnosis

Treatment of primary tumor

Resection of metastasis

Management of oncological emergencies

Surgery for palliation

Surgery for residual disease Surgery for reconstruction

Cytoreduction

Regional chemotherapy

# Surgery for Cancer Prevention

# **Role of Surgery in primary Cancer Prevention**

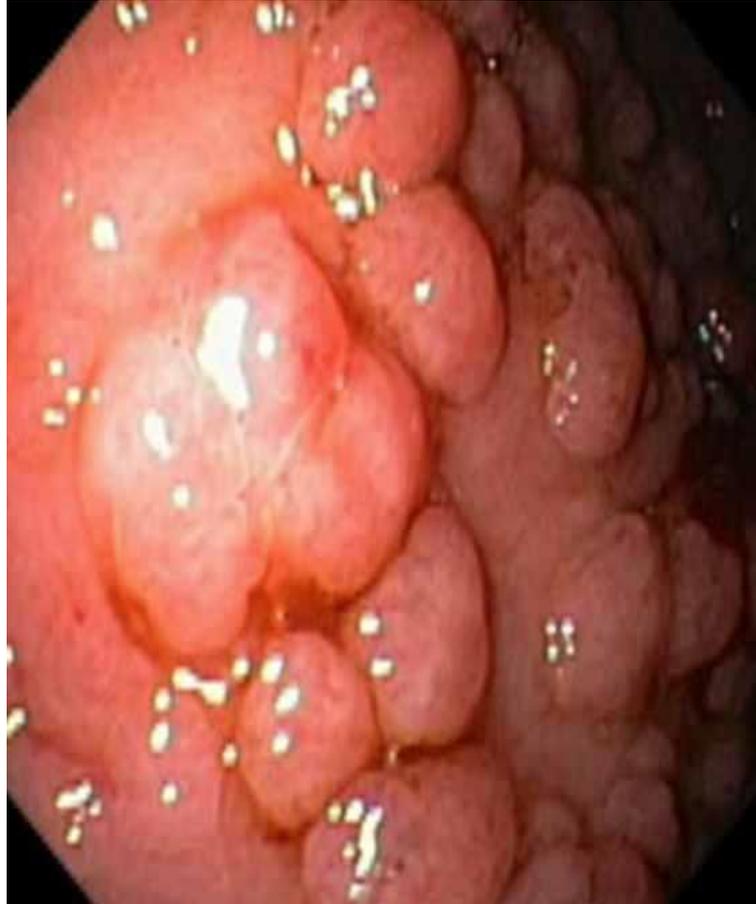
## **Pre-cancerous lesions**

- **Leukoplakia of the tongue**
- **Thyroid gland in MENS II**
- **Colon in FAP**
- **Colon in HNPCC**
- **Breast in BRCA mutations**

# Leukoplakia of the tongue



# Colon in FAP





# Role of Surgery in secondary Cancer Screening

- Colonoscopy in colon cancer
- Digital rectal examination in prostate cancer
- Clinical breast examination

# *Clinical Diagnosis*

**History & Physical Examination**

depends on involved system-late symptoms & signs

**Investigation for fitness and staging**

**Histological Diagnosis**

# **ROLES FOR SURGERY**

DIAGNOSIS OF CÄNCER

# *Histological Diagnosis*

**Needle Aspiration**

**Trucut Biopsy**

**Incisional biopsy**

**Excisional Biopsy**

## Fine Needle Aspiration Biopsy (FNAB)

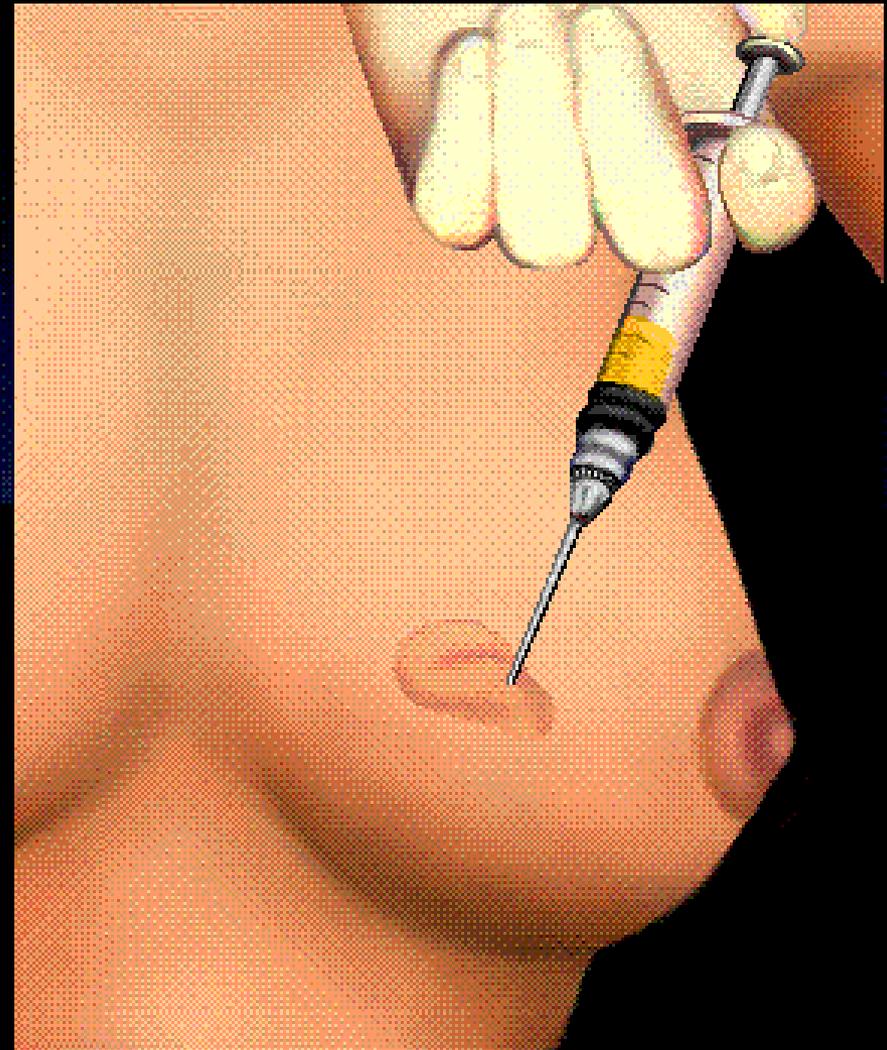
Fine needle **aspiration** biopsy is usually done in an office.

A small needle is inserted into the **tumor** and a sample of tissue is drawn up into the needle.

Material from the needle is put on a slide and examined for the presence of malignant cells.

It is a simple procedure done with minimal discomfort.

Disadvantage: May not always rule out **cancer** when it is negative.



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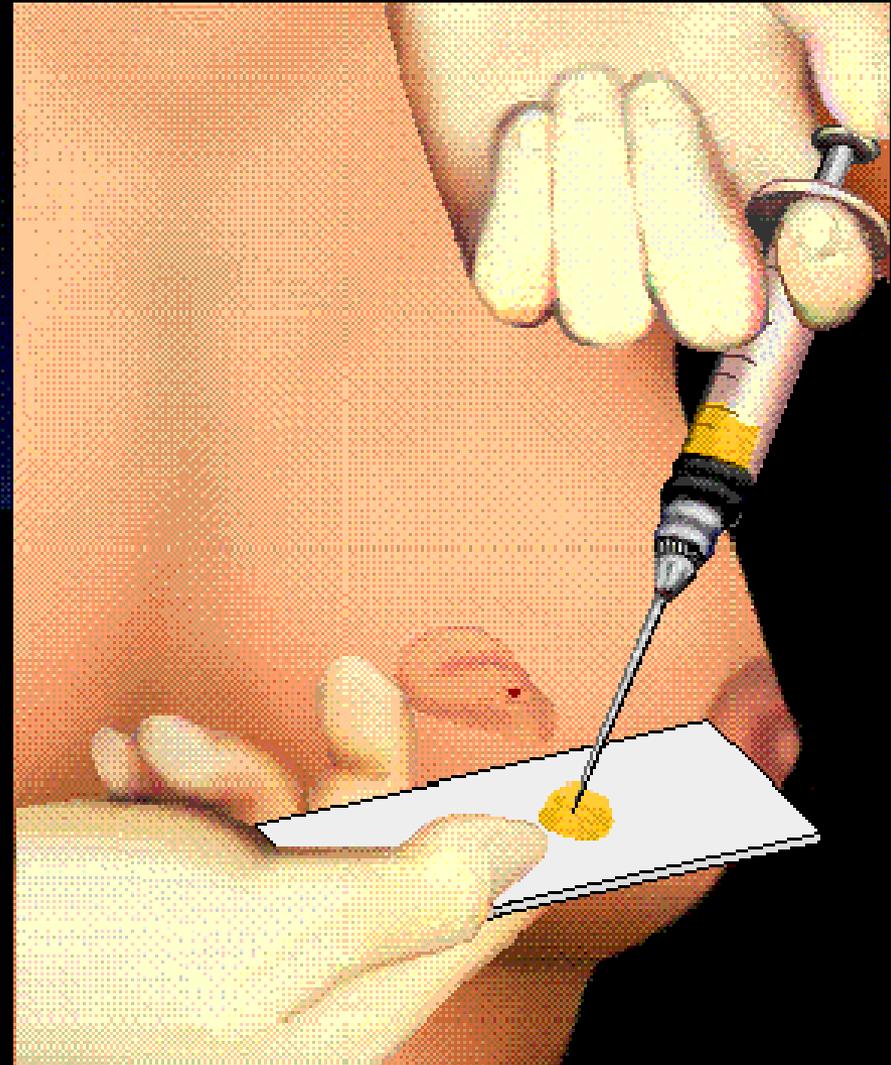
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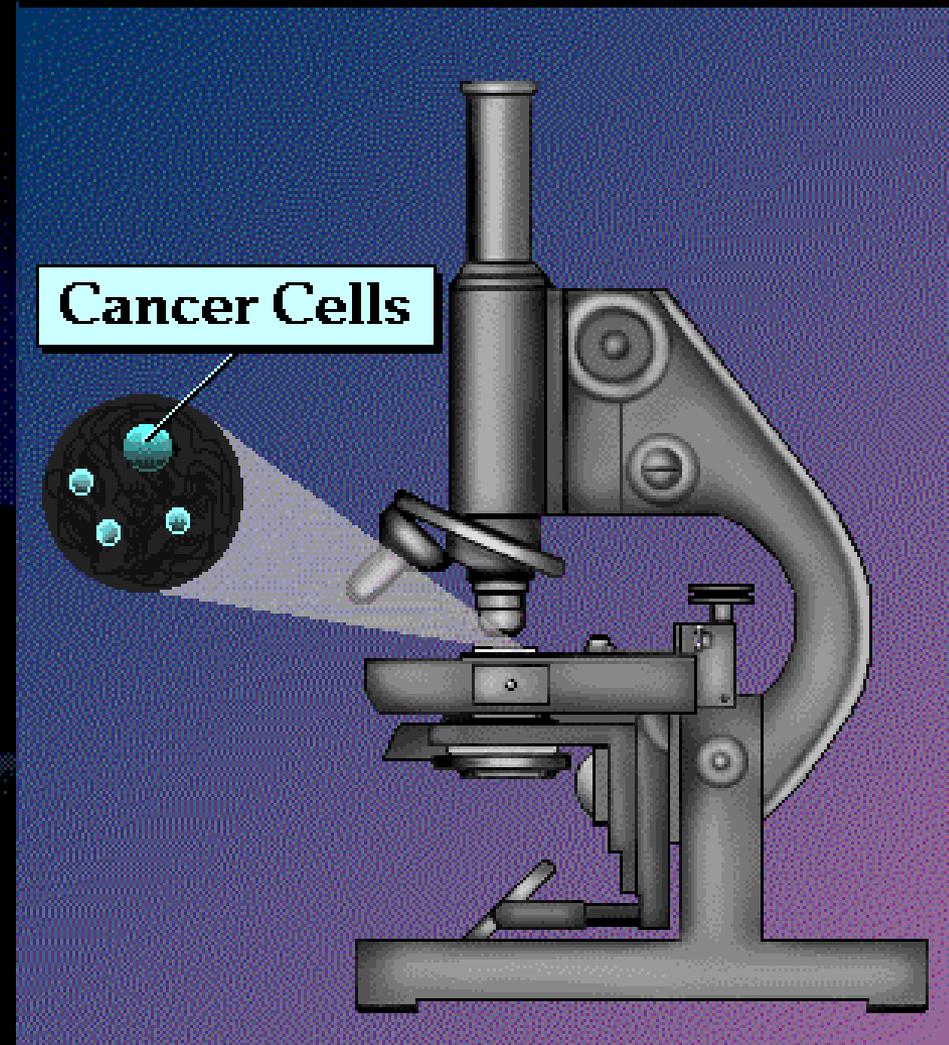
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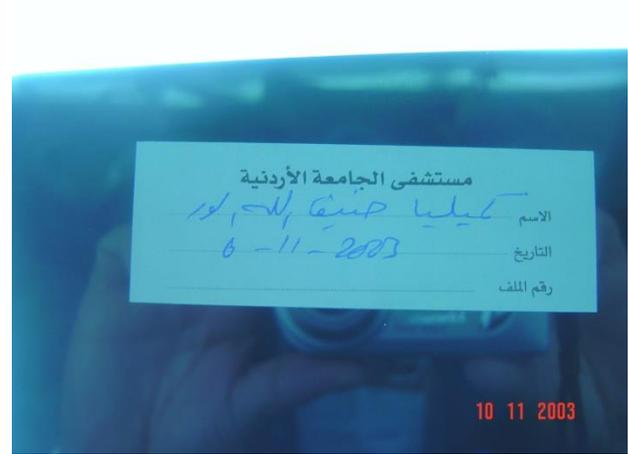
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## **Incisional biopsy**

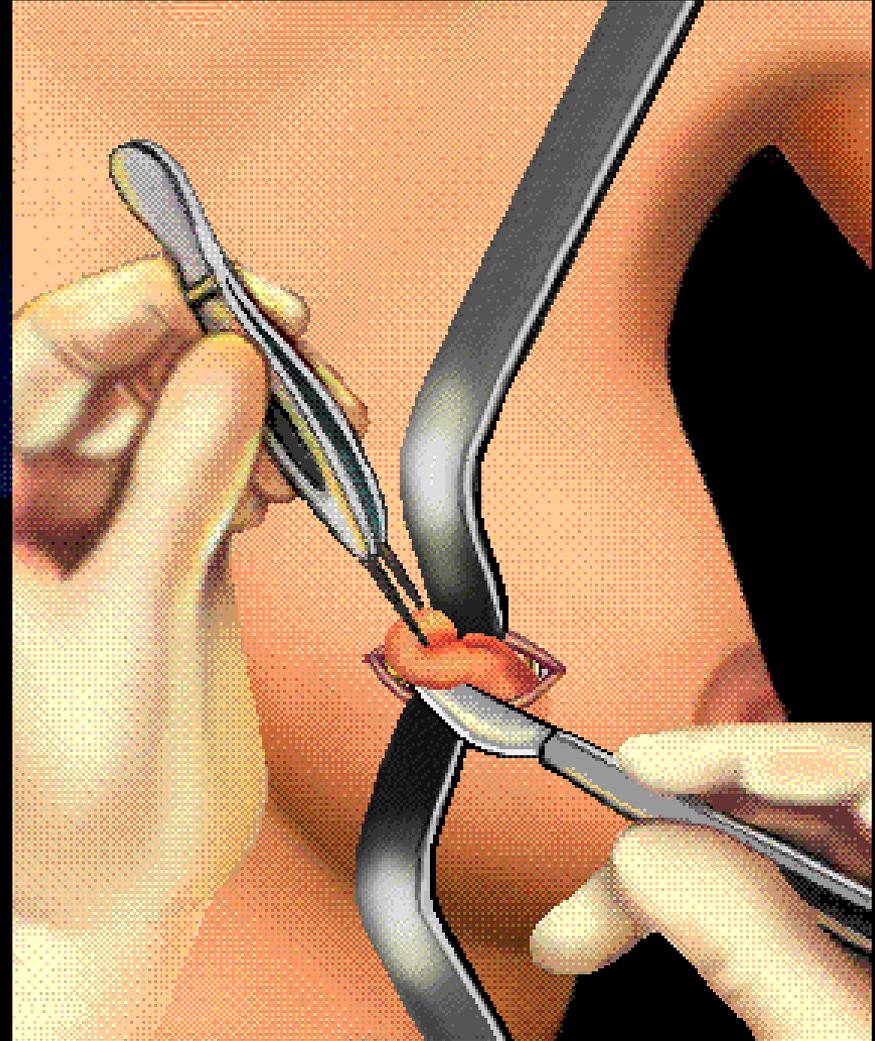
**Incisional biopsy is done under local anesthesia, often with mild sedation.**

**It is an outpatient procedure.**

**Only part of the tumor is removed for diagnosis.**

**Incisional biopsy is usually done when the tumor is large.**

**It is rarely performed except in special circumstances.**



## Excisional biopsy

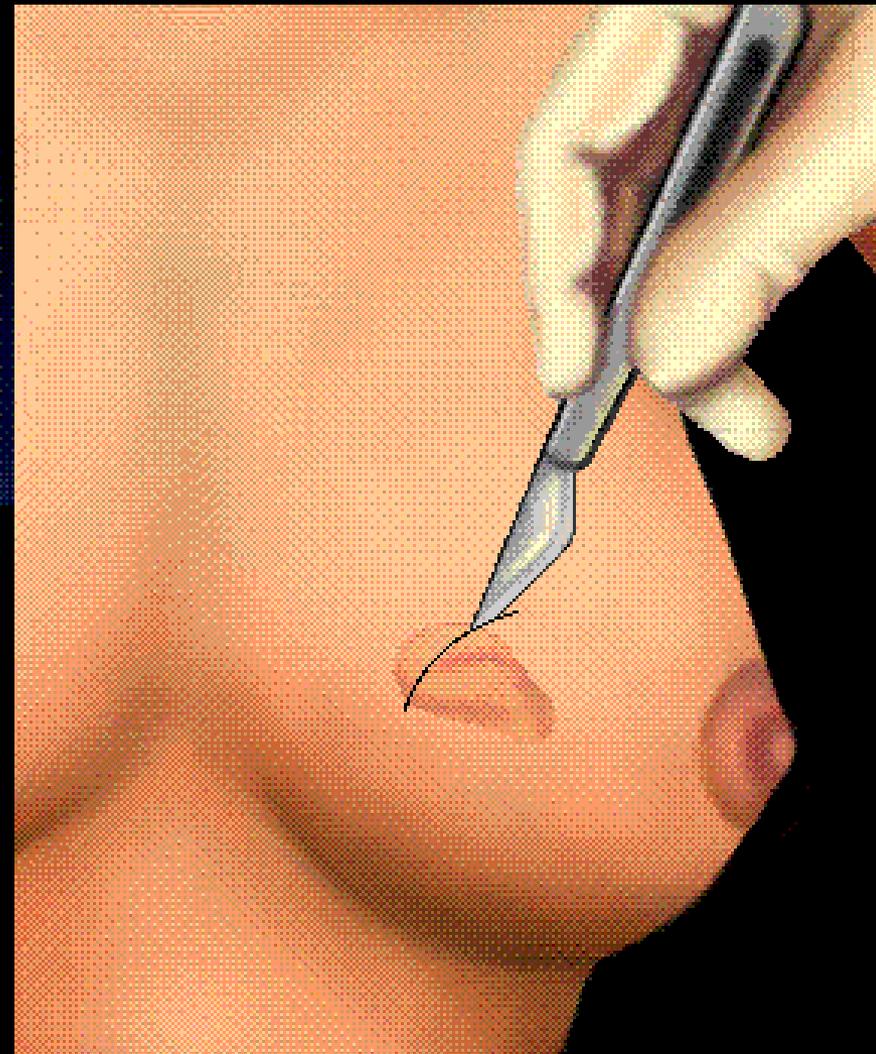
Excisional biopsy is the most common biopsy procedure.

It is an outpatient procedure.

It is usually done under local anesthesia, often with mild sedation.

The entire lump is taken out using a small incision on the breast.

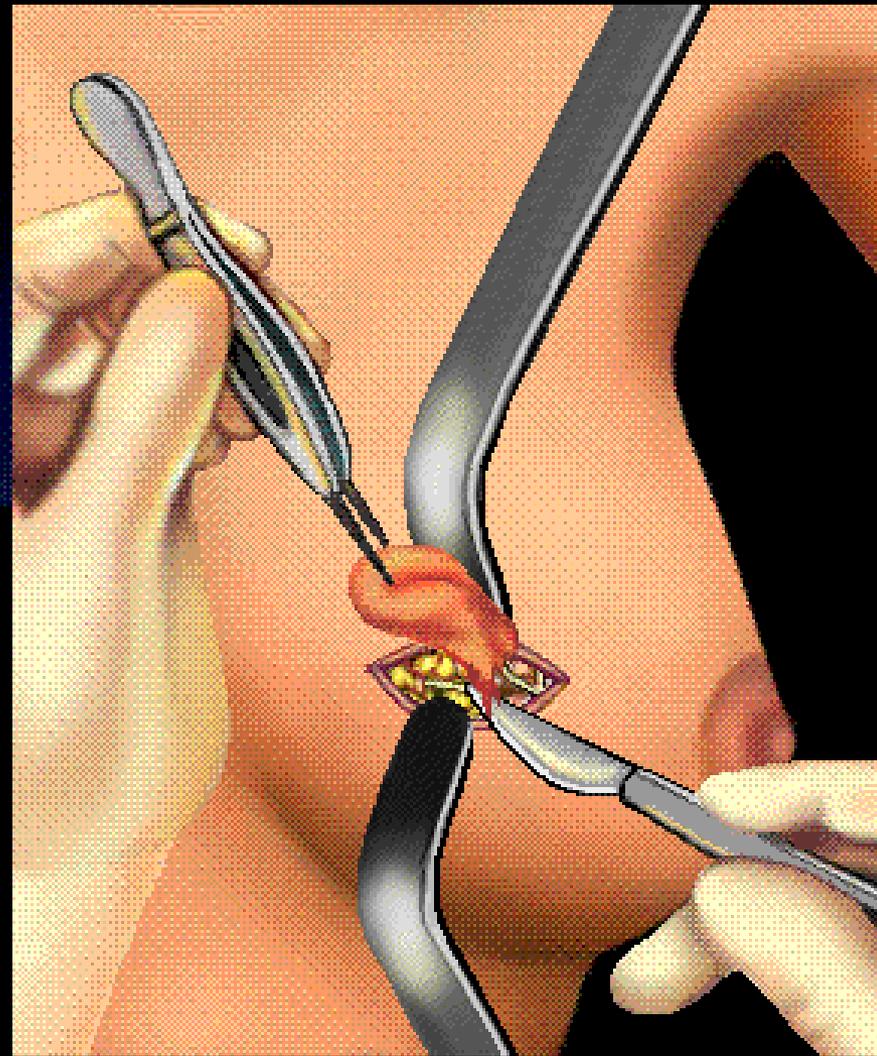
The pathologist examines the specimen for the presence of cancer.



## Lumpectomy

Sometimes the **excisional biopsy** which was used to diagnose the cancer is sufficient for the lumpectomy, if the margins were negative.

Lumpectomy with **radiation therapy** is as effective as **modified radical mastectomy**.



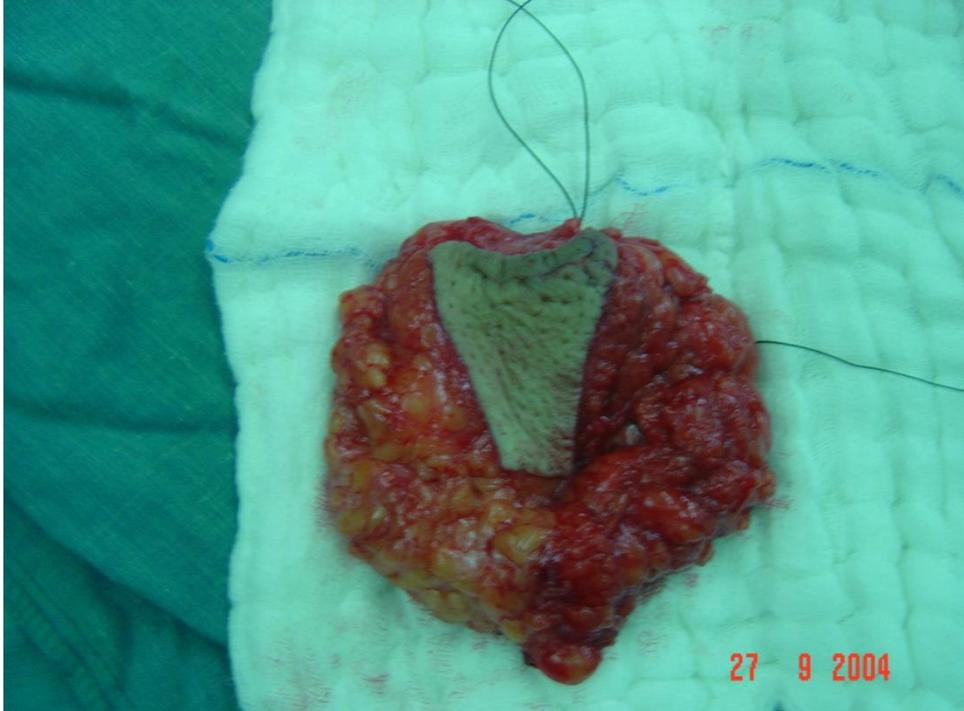
# Biopsy

## **Surgeon's responsibilities:**

- **Selection of appropriate biopsy method and site**
- **Responsible that the tissue reach the pathologist timely and properly .**
- **Communicate the results to the patient, family, other physicians**
- **Provide initial prognosis and information on follow-up care**

# Surgeon's Tasks in Performing Biopsy

- **Orient the specimen**
- **Ensure the integrity of the tissue plane**
- **Ensure the adequacy of the tissue sample**
- **Be sure tissue reach the pathologist !**



# surgical Management of cancer

## Objectives

cure

palliation

[single or part of multimodality]

The wide excision of primary **melanomas** in the skin that can be cured locally by surgery alone in about 90% of cases.

The resection of **colon cancers** with a 5-cm margin from the tumor results in anastomotic recurrences in less than 5% of cases

**The magnitude of surgical resection is modified in the treatment of adjuvant many cancers by the use of treatment modalities**

**local resection**

e.g. BCC

**wide local**

e.g. breast ca

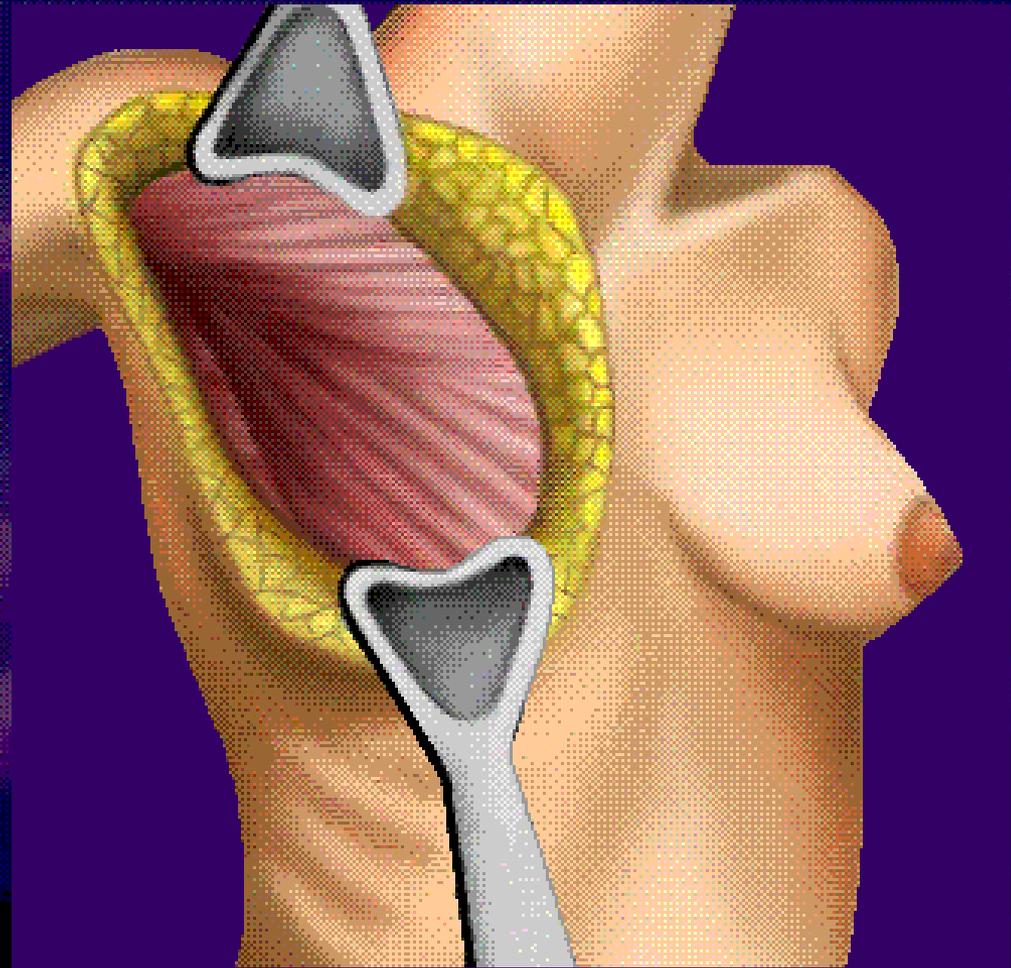
**radical local excision**

e.g. compartment

**en block excision**

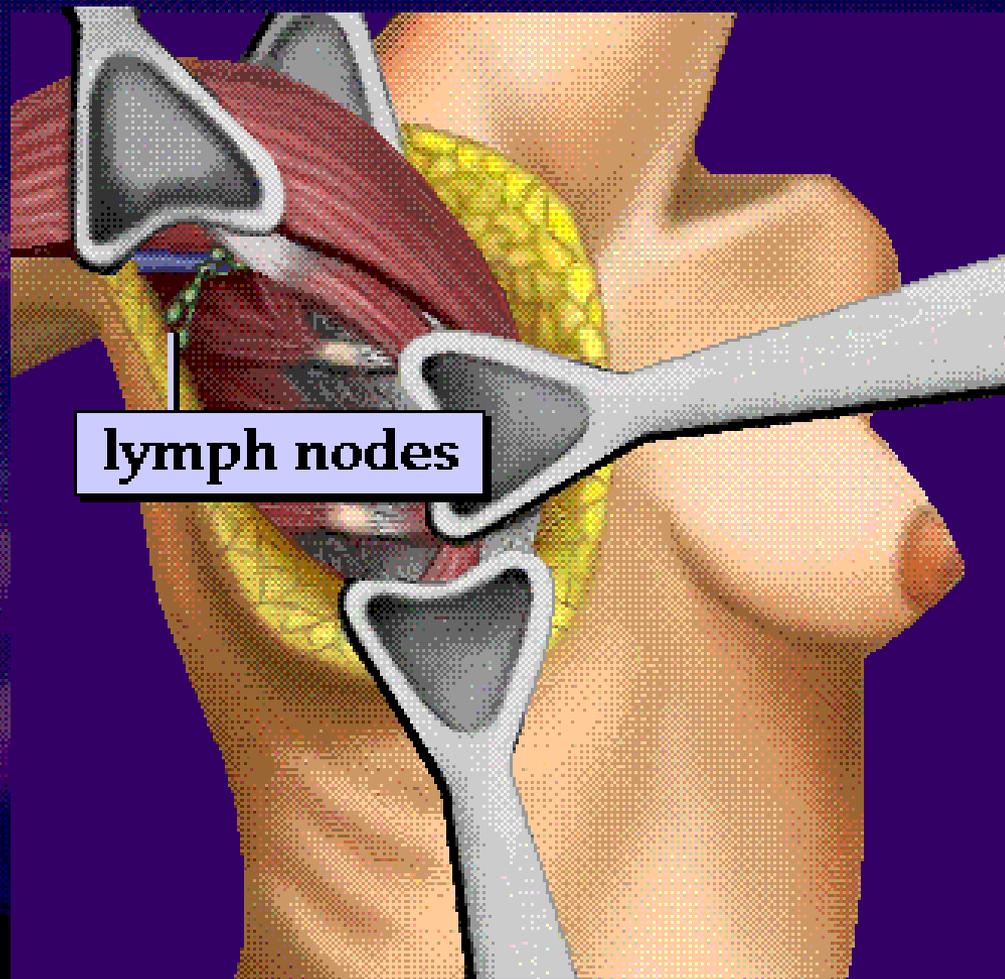
## Modified radical mastectomy

In modified radical mastectomy, the entire breast tissue is removed together with the **cancer** and some of the **lymph nodes** in the armpit. The muscles of the chest and arm are preserved.



## Modified radical mastectomy

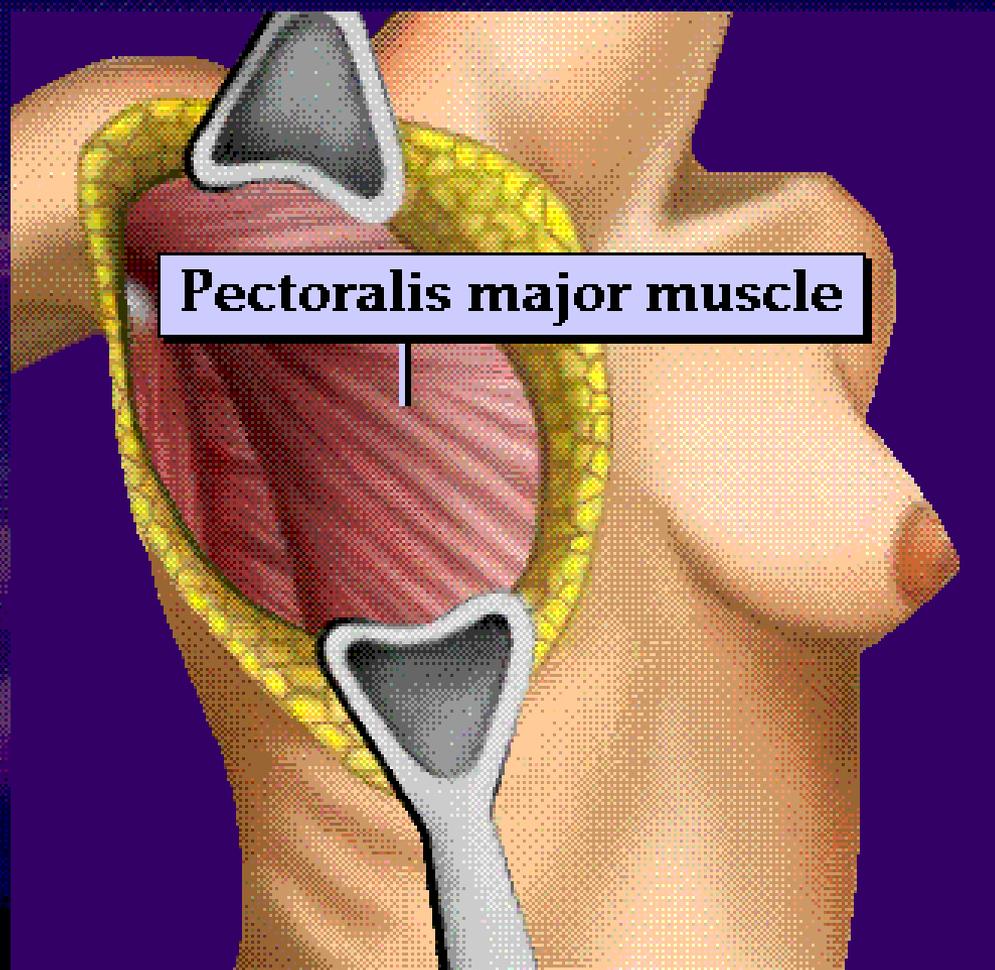
In modified radical mastectomy, the entire breast tissue is removed together with the **cancer** and some of the **lymph nodes** in the armpit. The muscles of the chest and arm are preserved.



## Radical mastectomy

In radical mastectomy the muscles of the chest (e.g., **pectoralis major** and **pectoralis minor**) along with the breast and **lymph nodes** are all removed.

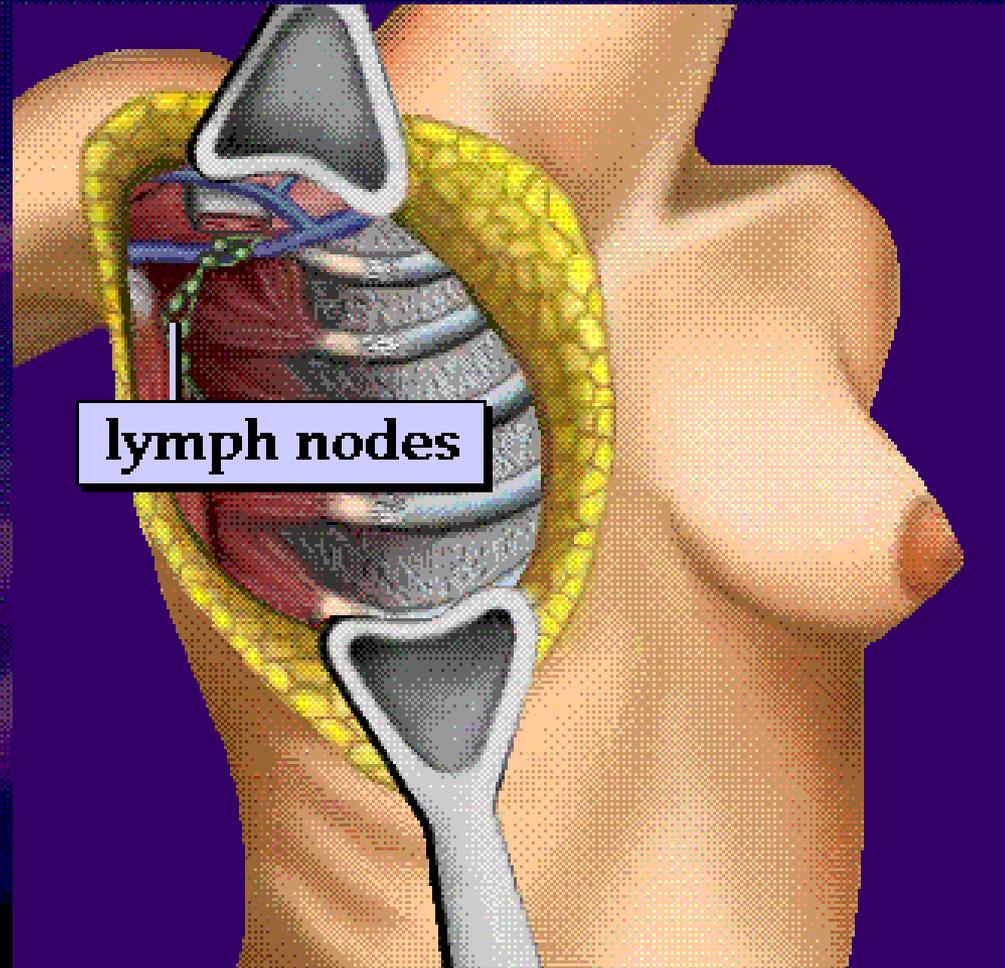
Radical mastectomy is now rarely performed. It is usually reserved for very large **cancers** that have grown into the muscle.



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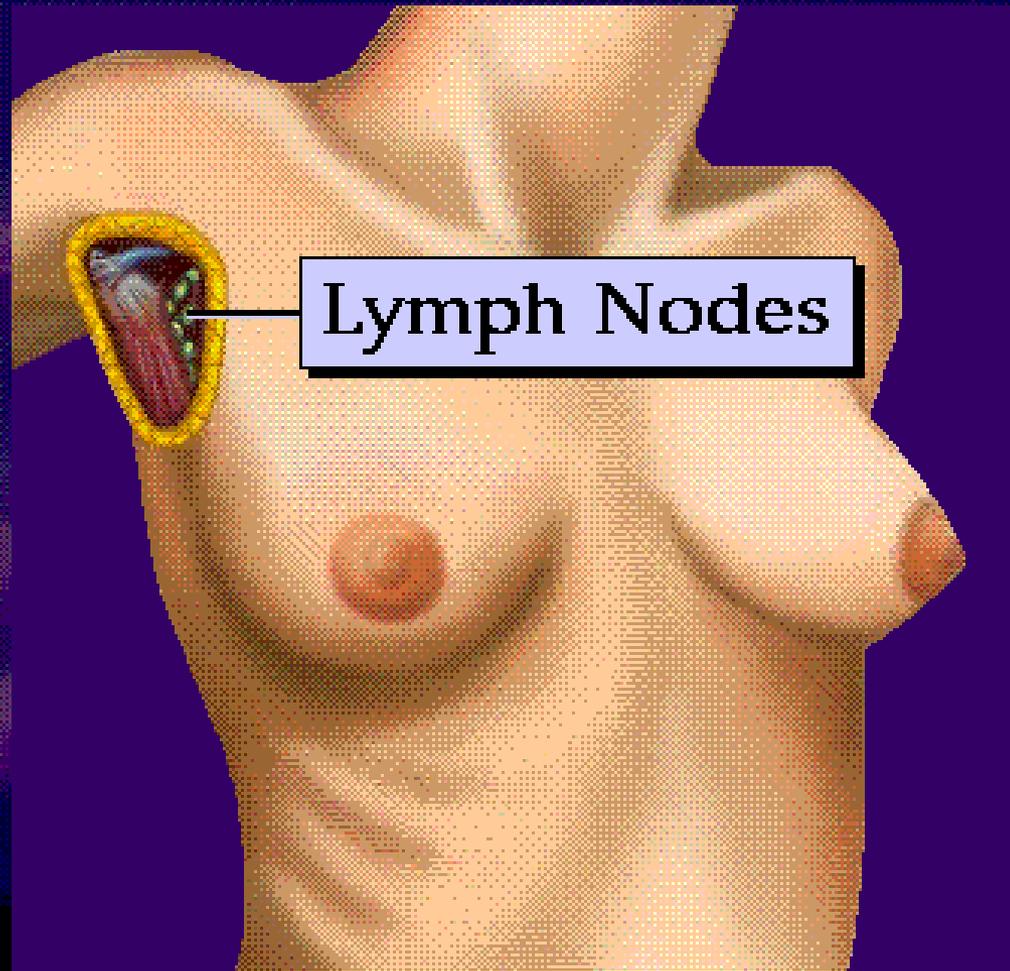


## Axillary node dissection

Axillary dissection involves sampling or removal of **lymph nodes** found in fatty tissue in the armpit. A separate incision is made in the armpit.

The purpose of axillary dissection is to see whether the **cancer** has spread to the lymph nodes, which is an important factor in the **prognosis**.

This procedure is done in conjunction with lumpectomy and **radiation therapy**, as part of the *breast conserving therapy*.



# Principles of surgical resection of tumor

- Adequate margin of resection
- Prevention of tumor spillage
- Minimal manipulation
- Reconstruction

# Surgery for palliation

Colostomy

Gastrostomy

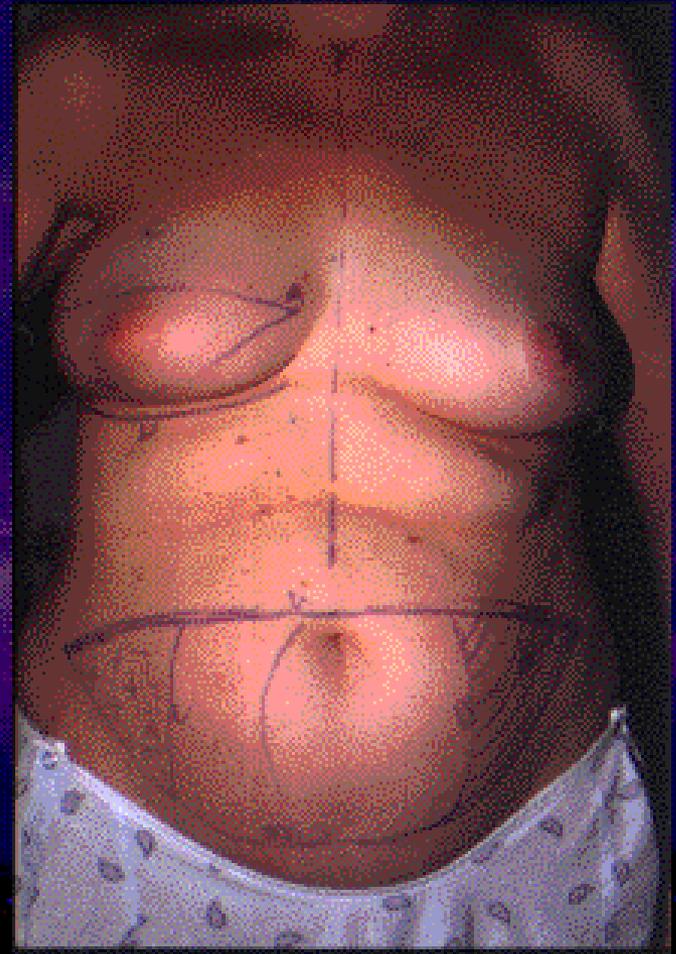
Amputation



## General Principles

Breast reconstructive surgery can be performed either at the same time that the breast is removed, or at a later date. More and more women are choosing to have their breast reconstruction begun at the same time their own natural breast is removed.

Most women who undergo **mastectomy** can have breast reconstruction.





**Cytoreductive surgery**

**Ovarian cancer**

**Burkitt's lymphoma**

# ***Surgery for Metastatic Disease***

**metastases to:**

**-lung**

**-brain**

**-liver**

**can be controlled by surgical resection**

**-**

# Metastasectomy

**This is done when:**

- **The primary tumor is controlled or can be controlled**
- **Metastasis is single or multiple**
- **Evidence that metastasectomy is associated clinical benefits**
- **Tumor doubling time is sufficiently long**
- **No significant co-morbid factor**

# Metastasectomy

- **Complete resection of distant metastases improves five-year overall survival rates**
- **40% for colorectal cancer with resection of liver metastases**
- **30% for sarcoma with resection of lung metastases**
- **16% for breast cancer with resection of brain metastases**

# SURGERY FOR ONCOLOGIC EMERGENCIES

**Hemorrhage**

**Abscesses**

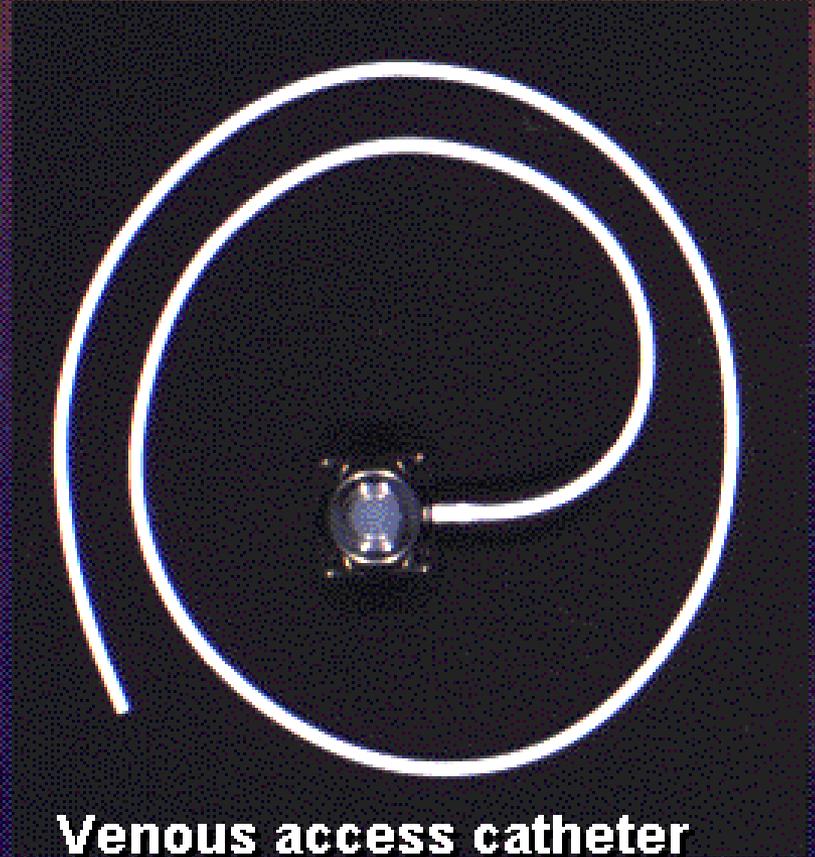
**Perforation**

**gastrointestinal Perforation of the  
tract after effective treatment for  
lymphoma**

**central nervous cancer invading the  
system represents another  
surgical emergency that can lead to  
preservation of function.**

## Venous access catheters

A venous access catheter is a small, flexible, hollow tube, which is surgically placed into a large vein where it can be left for several months. Venous access catheters are used for repeated infusions of **chemotherapy** drugs, antibiotics, and other intravenous fluids. They can also be used for blood-drawing. Venous access catheters are useful when veins are small or difficult to find.

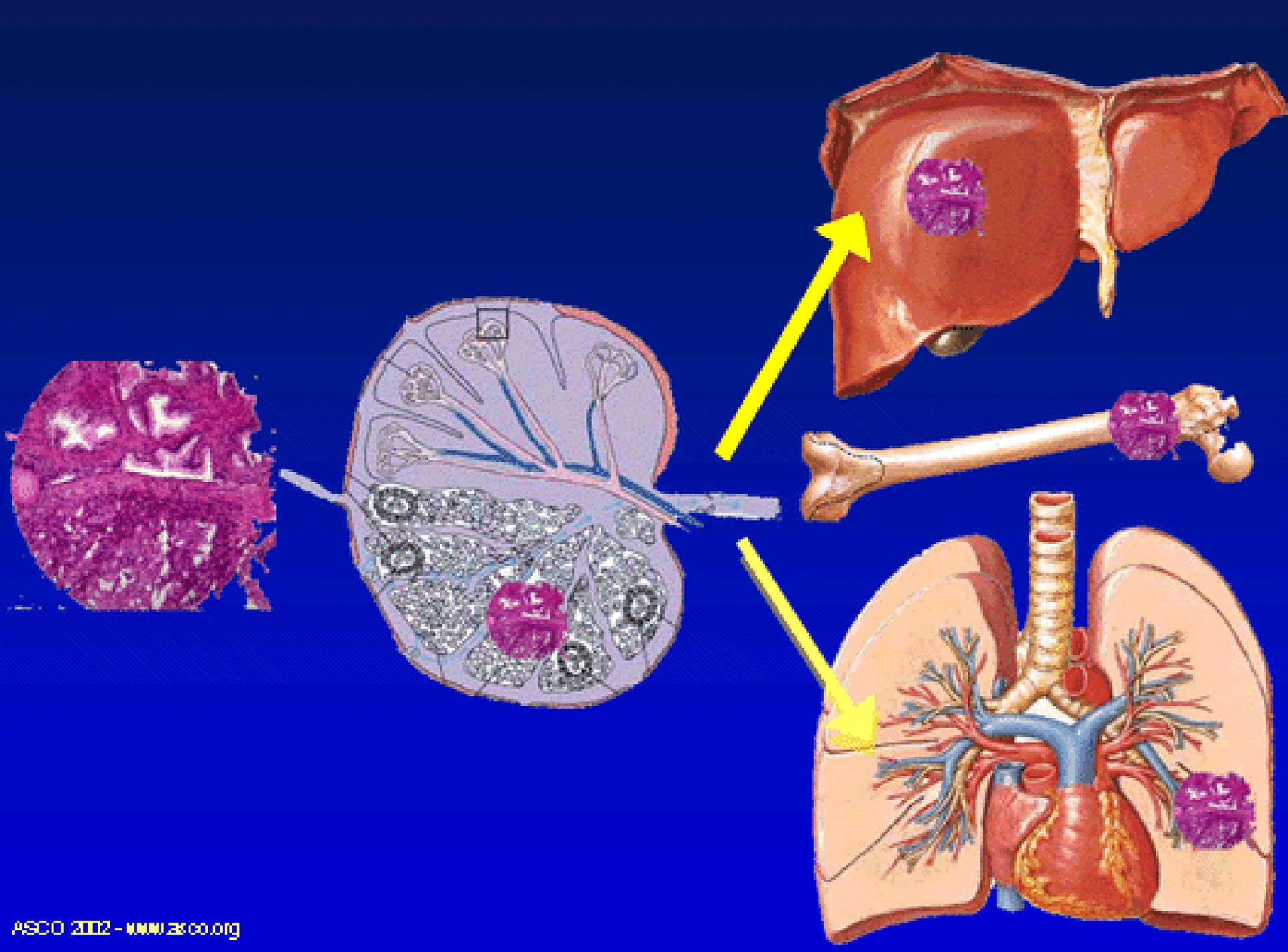


Venous access catheter



# Staging of cancer

Staging is the clinical or pathological assessment of the extent of cancer spread



# staging

Clinical staging is a preoperative assessment

It is based on clinical, radiological and operative information

Used to determine treatment offered to the patient





# The ideal staging system

- Easy to use and remember
- Reproducible - not subject to inter or intra-observer variation
- Based on prognostically important pathological factors

# TNM system

Based on anatomical extent of spread

-**T** refers to the extent of primary tumor

-**N** refers to the extent of nodal metastases

-**M** refers to the presence or absence of distant metastases

T - primary tumor

Tx primary tumor can not be assessed

To no evidence of primary tumor

Tis carcinoma in-situ

T1-4 increasing size and local extent of primary tumor

# - staging

**N** - regional lymph nodes

**Nx** regional lymph nodes can not be assessed

**N0** no regional lymph node metastases

**N1-3** increasing involvement of regional lymph nodes

# staging

**M** - distant metastases

**Mx** distant metastases can not be assessed

**M0** no distant metastases

**M1** distant metastases present

# staging

The TNM system is generally accepted

Does not recorded all factors (e.g. grade, contiguous organ involvement) that is prognostically important

# TNM Criteria

**T = Primary Tumor**

Tis = carcinoma in situ

T1 = less than 2 cm in diameter

**T2 = between 2 and 5 cm in diameter**

T3 = more than 5 cm in diameter

T4 = any size, but extends to the skin or chest wall

**N = Regional Lymph nodes**

N0 = no regional node involvement

**N1 = metastasis to movable same side axillary nodes**

N2 = metastasis to fixed same side axillary nodes

N3 = metastasis to same side internal mammary nodes

**M = Distant Metastasis**

**M0 = no distant metastasis**

M1 = distant metastasis

T2N1M0

# Example Case



This fifty four year old lady proved to have left breast cancer .She had large fixed ipsilateral axillary Lymph nodes. Metastatic work up was negative. What is her clinical TNM stage?

2003 0 5

# Clinical Staging

Table taken from How to Prevent Breast Cancer, page 37.

	T	N	M	5-Year Survival
Stage 0	Tis	N0	M0	> 95%
Stage I	T1	N0	M0	Overall = 85%
Stage II				Overall = 66%
(Stage IIA)	T0	N1	M0	
	T1	N1	M0	
	T2	N0	M0	
(Stage IIB)	T2	N1	M0	
	T3	N0	M0	
Stage III				Overall = 41%
(Stage IIIA)	T0	N2	M0	
	T1	N2	M0	
	T2	N2	M0	
	T3	N1, N2	M0	
(Stage IIIB)	T4	Any N	M0	
	Any T	N3	M0	
Stage IV	Any T	Any N	M1	Overall 10%

# Staging

Dukes staging of colorectal cancer

First published in 1932 for rectal cancers

Now used for all rectal and colonic cancers

# staging

Duke's A - spread into submucosa but not through muscle

Duke's B - spread through muscle but nodes negative

Duke's C - lymph node metastases present

Often divided into C1 and C2 dependent on the involvement of the highest lymph node

# staging

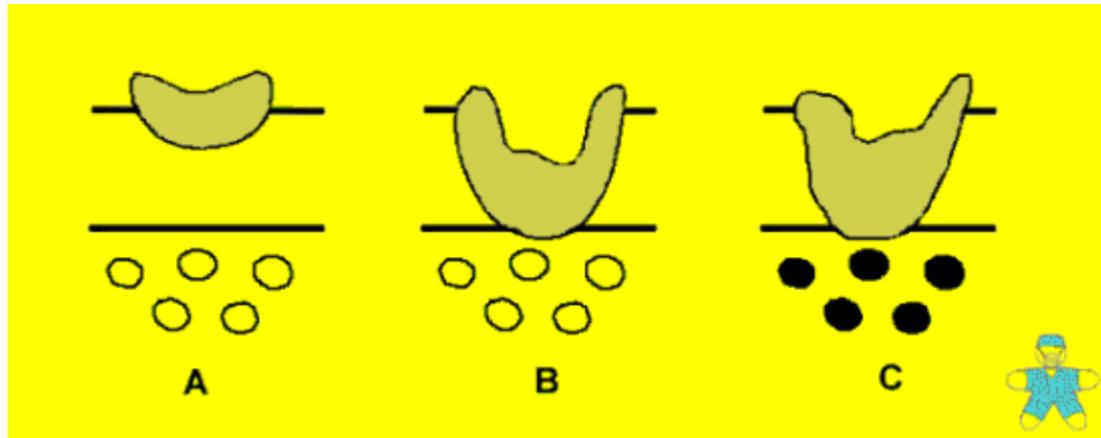
Advantages of the Dukes classification are that it

Is simple and reproducible

Accurately reflects prognosis

Accepted worldwide

# stagnina



# **Role of Surgery in Cancer Care**

**“Surgery makes its contribution to cancer treatment in concert with other modalities.**

**Advances in the treatment of cancer will derive from improved orchestration with the other modalities rather than from improved operative technique alone.”**

*Bernard Fisher,  
1977*

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# Learning Objectives

*After completing this module, attendees should be able to*

- Describe the various considerations related to biopsy
- Summarize the use of surgery with “*curative intent*”
- Discuss surgery for “*palliation*”
- Explain the role of surgery for treatment-related complications
- Identify the oncologic emergencies requiring surgery
- Describe the various prophylactic surgeries for cancer prevention
- Discuss the future of surgical oncology

## Role of Surgery in Cancer Care

- **Surgery**

**Zero-order kinetics—100% of cells at risk are killed with a single treatment**

- **Radiotherapy/Chemotherapy**

**First-order kinetics—only a portion of cells at risk are killed during treatment, which is followed by regrowth**