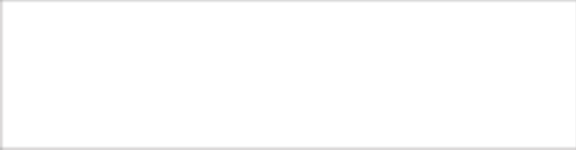


Surgical Oncology

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Colorectal & surgical oncology

- A neoplasm or new growth consists of a mass of transformed cells that does not respond in a normal way to growth regulatory systems.
- These transformed cells serve no useful function and proliferate in an atypical and uncontrolled way to form a benign or malignant neoplasm.
- In normal tissues, cell replication and death are equally balanced and under tight regulatory control.

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- However, when a cancer arises, this is generally due to genomic abnormalities that either
 - Increase cell replication
 - Decreased programmed cell death (apoptosis)
 - A combination of the two.

- The concept of tumour progression from a benign to malignant phenotype provides the rationale behind screening and early detection programs ; i.e. if benign or pre-invasive lesions are removed, this will prevent invasive disease.

- Neoplasms may be benign or malignant; the essential difference is the capacity to invade and metastasize.
- Metastases are cancer deposits similar in cell type to the original cancer found at remote (secondary) sites in the body.
- The cells of benign tumours do not invade surrounding tissues but remain as a local conglomerate.
- Malignant tumours are invasive and their cells can directly invade adjacent tissues or enter blood and lymphatic channels, to be deposited at remote sites.

- The process of invasion and metastasis is complex and is dependent on the biology of the tumor.
- For metastases to occur it would appear that further mutations need to occur in the cancer cells.
- These extra mutations can be called the metastatic signature.

- Some tumours metastasize earlier in their clinical course than others.
- This variation may depend on the tissue of origin of the primary tumour, but can also vary widely according to the phenotype of individual tumours.
- For example, cancer of the breast is thought to metastasize early, and micrometastases are often present but not detectable when the patient first presents.
- Some patients with apparently localized colorectal cancer are cured by radical surgery, but others receiving the same treatment deteriorate rapidly with metastatic disease.

- Benign tumours rarely threaten life but may cause a variety of cosmetic or functional abnormalities.
- In contrast, malignant tumours invade and replace normal tissues, destroying supporting structures and disturbing function; they can spread to distant tissues (metastasize), eventually causing death.

- Clumps of cancer cells can then embolize to distant tissues and form metastases.
- The location for the development of metastases could be a simple mechanical property with organs that have fine capillary beds, such as liver and lung, trapping circulating malignant cells which then develop into metastases.

Definition of cure

- Calculations based on an exponential model of tumour growth suggest that three-quarters of the lifespan of a tumour is spent in a 'pre-clinical' or occult stage, and that the clinical manifestations of the disease are limited to the final quarter.
- For cure, every malignant cell must be eradicated
- There should be no recurrent tumour during the patient's lifetime, or evidence of residual tumour at death. This rigid definition of cure is rarely attainable.
- Instead, a normal duration of life without further clinical evidence of disease is generally accepted as evidence of cure, even though microscopic deposits of tumour may still be present.

Screening

- Detecting benign lesions with malignant potential, pre-invasive cancer, and invasive malignancy before it becomes symptomatic.
- The screening test should be
 - Be sensitive
 - Be specific
 - Be acceptable
 - Detect cancer at a stage when early treatment is beneficial
 - Be cost-effective.

Surgery

- Cure
- Palliative (Treat complications)
 - Local effect
 - Systemic

Local effect

- A tumour that lies on the surface of the body may become
 - visible, change in shape or pigmentation, bleed, or discharge mucus or pus.
- A hollow viscus or duct may be obstructed by a tumour
 - Bronchus (causing pulmonary collapse),
 - Segment of bowel (causing intestinal obstruction) or
 - The bile duct or pancreatic duct (causing jaundice, or pancreatitis).
- A tumour within a closed space may cause pressure symptoms.
 - Increased intracranial pressure may complicate intracerebral tumours, and paraplegia may arise from a spinal cord tumour.

- Invasion of an organ by a tumour may compromise its normal functions and cause organ failure.
- Invasion of tissues such as the pancreas, bone or nerves can cause severe pain.
- A cancer can also mimic the pain of benign disease: for example, dyspeptic symptoms in stomach cancer.

Systemic effects

- Weight loss
 - Some patient becomes emaciated that they appear to die of starvation.
 - This syndrome is known as cancer cachexia, and is clinically characterized by anorexia, severe weight loss, lethargy, anemia and edema.
- The secretory products of some tumors
 - Adrenal cortex tumor may secrete excess corticosteroid and cause Cushing's syndrome;
 - Parathyroid tumour may secrete excess parathormone and cause hypercalcaemia;
 - Islet cell tumour of the pancreas may secrete excess insulin and cause hypoglycaemia .

Symptoms that needs work up

- Weight loss
- Rectal bleeding/melaena
- Haemoptysis/persistent cough
- Haematuria
- Breast lump
- Dysphagia/dyspepsia
- Persistent headache
- Persistent non-specific symptoms.

Investigation

- Base line for the patient
- Reaching the diagnosis
- Staging

- CXR
- US
- CT
- MRI
- PET CT
- Laparoscopy
- FNA
- Tru cut

TNM

- T tumor size or level of invasion
 - N node involvement
 - M metastasis
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- pTNM this is the pathological TNM ie post operative which is more accurate than radiological one
 - Large LN may be reactive while small one may be metastatic

Grading

- Based upon the microscopic appearance of a neoplasm with H&E staining.
- In general, a *higher grade* means that there is a **lesser degree of differentiation** and the worse the biologic behavior of a malignant neoplasm will be.

- **G I** Well differentiated
- **G II** Moderately differentiated
- **G III** Poorly differentiated
- **G IV** Nearly anaplastic

- Prognosis is also affected by the biological characteristics of a tumour.
 - Its degree of nuclear and cellular atypia and the extent of lymphocytic infiltration, inflammatory response, and perineural and vascular invasion all influence outcome.
- Biochemical indices (e.g. oestrogen receptor status in breast cancer), can all be used in the planning of a patient's treatment.

Treatment

Benign

- Local Excision

Malignant

- A radical cancer operation implies complete removal of the tissue bearing the tumour, together with a margin of unaffected surrounding tissue along with the locoregional lymph nodes (known as 'en bloc resection').
- The removal of local lymph nodes is important in some cases to provide information for the stage of the cancer, rather than being of true therapeutic benefit.

- *'Laparoscopic surgery for colorectal cancer allows for shorter hospital stay and is as good as the open technique in terms of short-term survival and recurrence rates.'*

Adjuvant Therapy

- Sometimes not possible to remove all the local disease.
- Early systemic dissemination may have occurred.
- Thus, an adjuvant to surgery is needed to provide both local and systemic control .

- Achieving a balance between the relief of symptoms and the morbidity induced by radical cancer therapy is often difficult, and it is important to remember that the quality of life is as important as the duration of survival.

- chemotherapy may help prevent both local recurrence and distant metastasis, and this is commonly used in patients with colorectal or breast cancer and who have lymph node involvement.
- Results in colorectal and breast cancer suggest that the likelihood of death from recurrent cancer is reduced by about 20–30% in patients with evidence of lymph node metastasis

Radiotherapy

- It is administered to reduce the chances of local recurrence rather than of distant metastasis.
- May be given prior to surgery to try to 'down-stage' or shrink a bulky and fixed tumour (e.g. rectal cancer) and thus make surgery easier to perform. this is termed neoadjuvant radiotherapy.
- Alternatively, it may be given to the postoperative patient in whom the chances of local recurrence are thought to be high (e.g. a patient in whom the margins at the edge of the resection specimen are involved with tumour).
- When tumours are relatively radiosensitive, radiotherapy can reduce the need for radical surgery and a more cosmetically acceptable conservative operation is then possible (e.g. lumpectomy and radiotherapy, as opposed to mastectomy in breast cancer).

- Surgical excision must be adequate, and adjuvant radiotherapy or chemotherapy must not be regarded as a safety net for careless surgical practice.

- Metastatic disease now are treated for cure.
- Intense follow up is a must to ensure early detection for any recurrence.

Palliation

- The management of patients with incurable disease involves the relief of distressing symptoms (palliative care).
- The terminal stages of malignancy can be prolonged, and pain and other distressing symptoms are common.
- Effective palliation is achieved by a variety of means. Local and/or systemic adjuvant therapy can be used to induce tumour regression: for example, to reduce the pressure effects of cerebral metastases. Surgery can be employed to resect symptomatic metastases or bypass a malignant obstruction.

- When a palliative operation is performed, the patient and his or her relatives should understand that its object is to prevent additional suffering, and not to attempt cure.

Thank U

