



“बेटी बचाओ, बेटी पढ़ाओ”

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR
FACULTY OF PHYSIOTHERAPY & DIAGNOSTICS

Faculty Name : JV'n Ankita
Program : M.Sc. Zoology 3rd Semester
Course Name : Cancer & Radiation biology
Topic Name : Mechanism of Metastasis

Program Outcome :- It plays an important role in health sector, provides knowledge about the treatment of patient by the help of physiotherapy.

Course Outcome- Understand the fundamentals and basic physics which is used or responsible for the imaging process in medical sector and how to do the image interpretation.

Academic Day starts with –Greeting with saying ‘**Namaste**’ by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

Review of previous Session- **Type of Cancer**.

Today We will discuss about- **Mechanism of Metastasis**

Lesson deliverance (ICT, Diagrams & Live Example)- ICT, Diagrams

➤ Diagrams

Introduction & Brief Discussion

Mechanism of Metastasis:-

Metastasis is the process by which cancer cells spread from the primary tumor to other parts of the body, forming secondary tumors in distant organs or tissues. This complex process involves several key steps and mechanisms:

Local Invasion : Cancer cells from the primary tumor invade nearby tissues. They do this by breaking down the extracellular matrix, which is a network of proteins that provide structural support to cells. Enzymes called matrix metalloproteinases (MMPs) play a crucial role in this process.

Intravasation : Some cancer cells enter nearby blood vessels (intravasation) or lymphatic vessels (lymphovasation). These vessels serve as highways for the cells to travel through the body.

Circulation : Cancer cells that have entered the bloodstream or lymphatic system are carried to distant sites in the body. They may be transported to different organs and tissues.

Arrest : Not all circulating cancer cells survive. Many are destroyed by the immune system, while others may become trapped in small blood vessels at distant sites. This is known as arrest.

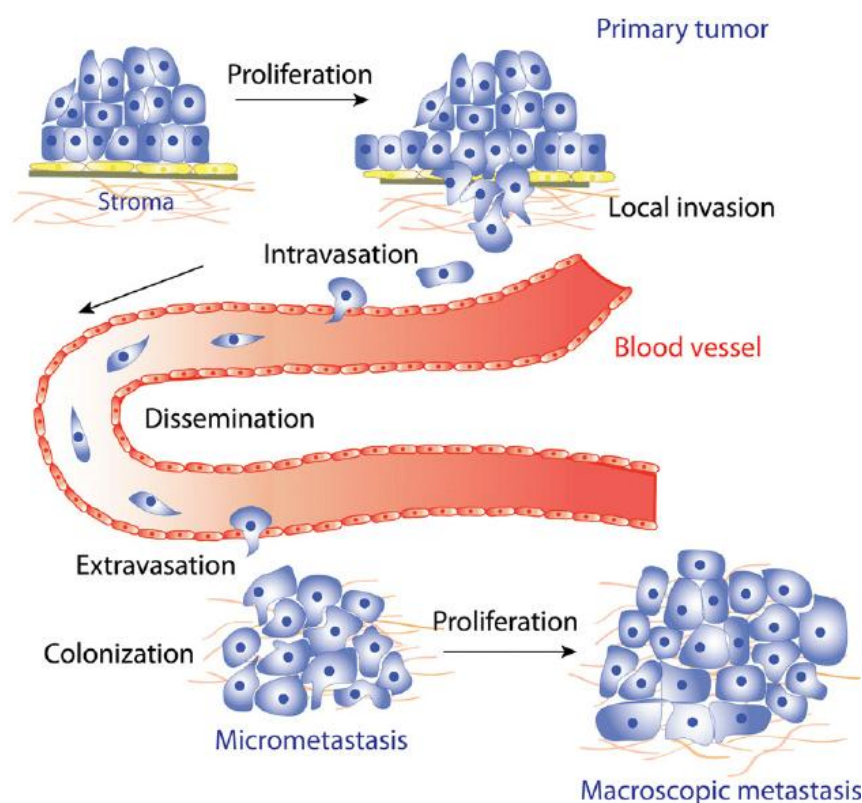
Extravasation : Some cancer cells successfully exit the bloodstream or lymphatic vessels and enter the surrounding tissue at a distant site. To do this, they must again break down the extracellular matrix, similar to the local invasion step.

Formation of Micrometastases : Once cancer cells have extravasated, they may start to divide and form tiny clusters of cells known as micrometastases. These are too small to be detected on imaging studies but can grow and eventually become macroscopic secondary tumors.

Angiogenesis: In order to continue growing and thriving, micrometastases need a blood supply. They stimulate the formation of new blood vessels (angiogenesis) to provide them with oxygen and nutrients.

Colonization: Some micrometastases will successfully establish themselves in the new tissue and grow into macroscopic secondary tumors. The ability of these cells to colonize the distant site is influenced by various factors, including the microenvironment of the target organ and interactions with the local immune system.

The process of metastasis is highly complex and is influenced by a multitude of factors, including genetic mutations in cancer cells, interactions with the host microenvironment, and immune system responses. Understanding these mechanisms is critical for developing strategies to prevent or treat cancer metastasis. Researchers continue to study the various aspects of metastasis to identify potential targets for therapy and to improve outcomes for cancer patients.



University Library Reference-

➤ Textbook of Radiology for Residents and Technicians by S. K. BHARGAVA

- Suggestions to secure good marks to answer in exam-

➤ Explain answer with key point of the answers

Questions to check understanding level of students-

➤ WHAT ARE THE DIFFERENT STAGES OF METASTASIS ?

➤ WHAT DO YOU MEAN BY MECHANISM OF METASTASIS ?

- Next Topic- **TUMOR ANGIOGENESIS**
- National song 'Vande Mataram'.