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Department of Biomedical Engineering

Course Name: 19BMT302 & Radiological Equipment

III Year : V Semester

Unit II – COMPUTED TOMOGRAPHY

Topic : Tomography Principal

19BMT302/Radiological Equipment/Unit 2/Ms.B.Divya/AP/BME



INTRODUCTION

- The word tomography is derived from the two Greek words:
- Tomos (=slice) and Graphia (=describing).
- So the tomography is describing of slices by imaging it.
- Tomography is a radiographic technique that selects a level in the body & blurs out structures below & above that plane leaving a clear image of this selected anatomy.
- Tomography concerned with layer rather than plane.



Need of Tomography

- As we know that tomography records cross-sectional image of selected layer, so by using tomography, we can evaluate the abnormality of that cross-section, that is usually superimposed by underlying and overlying structures in general radiography.
- If we want to see the debris of potato we have to cut it into different slice, same in tomography if we want to see any underlying abnormality than we have to a image the cut section .





A Brief History Of Tomography Invention



- It is a sobering thought that nearly 55% of what is done in radiology today did not exist 20 years ago.
- There were no MRI , no ultrasound or CT.
- Since the introduction of radiology in medicine, a need to see beyond the 2 dimensional image was gradually increasing, the first approach was to view orthogonal radiographs and make a mental 3D perception.
- But real major break through was tomography which is also called planigraphy or body section radiography.



History cont...

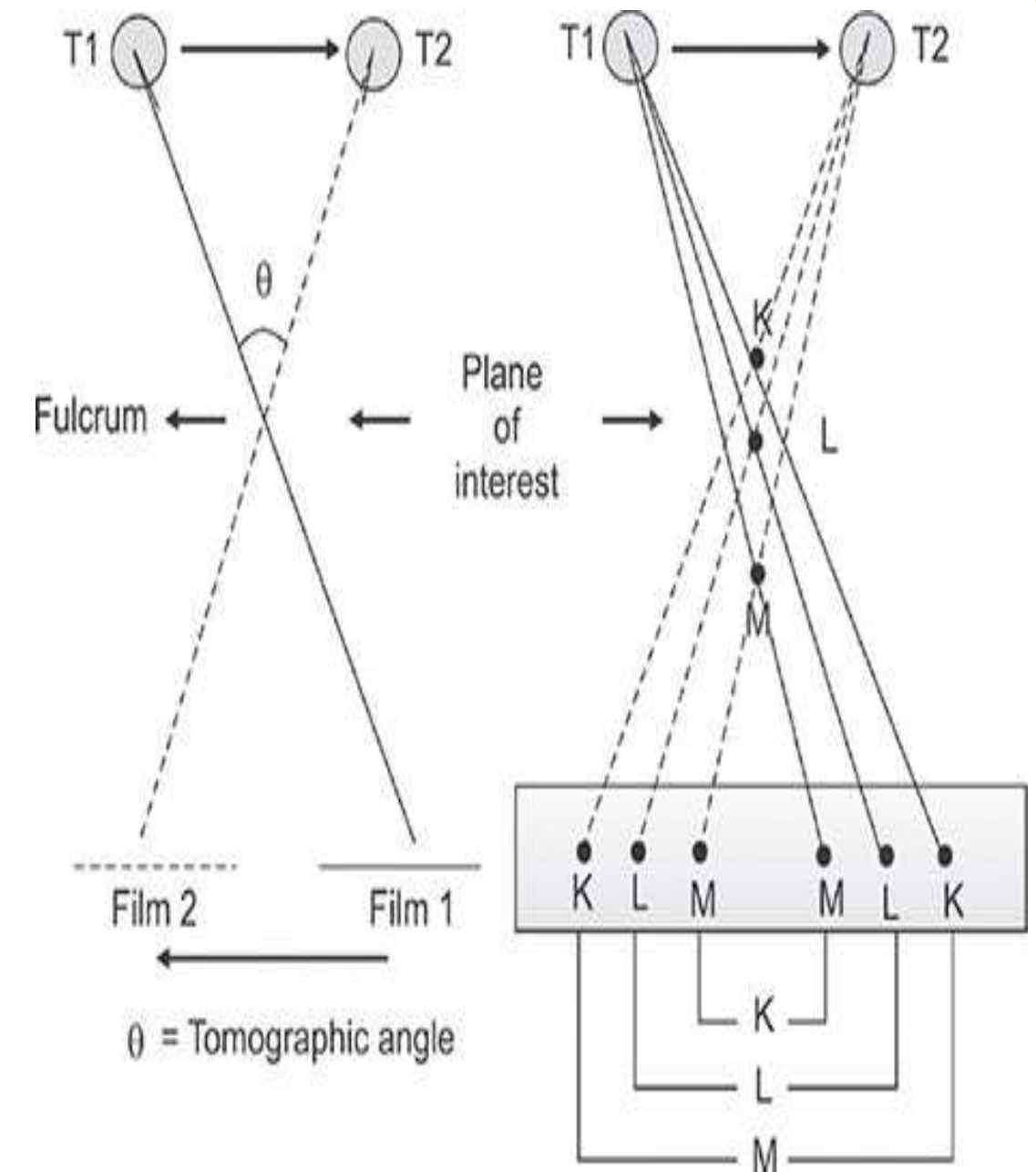


- The origin of tomography cannot be attributed to any person, but the major credit goes to JEAN KIEFFAR , a radiological technologist in US ,who developed the special radiographic technique to demonstrate a from of TB that he had in 1928.
- His process was termed “Laminagraphy” by another American J. ROBERT ANDREWS who assisted KIEFFAR in the construction of this first tomographic device known as LAMINAGRAPH.



Basic Principles of Tomography

- If there is synchronous movement b/w either of two among the three that is the patient x-ray tube or the image receptor, than there is blurring of image causes.
- While movement only one thing A is constant that is the fulcrum 3 point of the tomographic equipment and the plane which posses this point is well demonstrated.
- It also results —blurring of image of that structure which lie above and below to that plane.





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Now the synchronous movement can be achieved by any of the following methods:

- The film remains stationary while the x-ray tube and the patient move.
- The x-ray tube remains Stationary while the film and the patient move.
- The patient remains stationary while the x-ray tube and the film move.
- This is the most accepted technique used.